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SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH IN THE THIRD WORLD

HEARINGS

BEFORE THE

SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY

OF THE

JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

ONE HUNDRED FIRST CONGRESS

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SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH IN THE THIRD WORLD

TUESDAY, JUNE 13, 1989

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:35 a.m., in room 2359, Rayburn House Office Building, Hon. James H. Scheuer (member of the subcommittee) presiding.

Present: Representative Scheuer.

Also present: Frankie King and Orhan Yildiz, professional staff members.

OPENING STATEMENT OF REPRESENTATIVE SCHEUER, PRESIDING

Representative SCHEUER. Good morning.

We're continuing the look that we're taking into the question of the food population equation and we have run several hearings on this subject.

The purpose is to have some documentation, to have a primer, let us say, for all of the delegates to the 100th anniversary of the Inter-Parliamentary Union, which is taking place in London next fall, the first week in September.

There will be over a thousand delegates from all over the world there looking into the food population equation.

I've been after the IPU for many years to move into this area, and they finally have and I'm very pleased that they have.

This 3 days of hearings is a very essential component of the global food population conundrum. Never before have so many people stood to gain or lose so much as from the link between the environment and development.

As all of you are aware, the current global population of about 6 billion is scheduled to reach somewhere around 10 billion by the end of the first quarter of the next century.

The 10 billion will be composed of 80 percent of citizens of developing countries where already there are close to 8 billion people living in great poverty.

Rampant poverty pushes many developing countries to embark on any development project that will provide livelihoods in the short run, in the very short run, without considering even the median term, much less long-term environmental consequences.

I ask unanimous consent to put in the record an article from the Wall Street Journal, April 7, 1989, the "Amazon Tug-of-War Reaches Fever Pitch" is the headline. "Rich Nations See It as Vital Resource, Brazil as Economic Boon."

The Secretary of State of Planning in the western Amazon State of Rondonia is quoted as saying:

"For many people here, deforestation equals survival."

In other words, they can survive in the short run by deforesting that priceless resource, which, if it were harvested on a sustainable yield basis would provide incomes, national enrichment for an eternity.

So, by destroying the goose that lays the golden egg, they will provide a few jobs for a few years, applying slash and burn agricultural techniques to a land that had been host to a very beautiful tropical forest with a priceless variety of natural species, plants and animals, including plant species that provide approximately 33 to 40 percent of all of our new drugs and pharmaceutical products. All of that is destroyed in the desperate search to provide land and a living for a few pitiful short years before that land collapses.

[The article referred to for the record follows:]

A12 THE WALL STREET JOURNAL FRIDAY, APRIL 7, 1989

Amazon Tug-of-War Reaches Fever Pitch

Rich Nations See It as Vital Resource, Brazil as Economic Boon

By Roger Cohen
Staff Reporter of The Wall Street Journal

BRASILIA, Brazil—When four U.S. senators entered the Brazilian Congress last week, they were greeted by a salvo of charges of interference and neo-colonialism because of their interest in the fate of the Amazon rain forest.

"We Brazilians are not bandits," said Congressman Samir Achoa, pointing a finger at Sen. John Chafee of Rhode Island. "We are not bandits devastating our forest."

It was an unlikely scene. But the Amazon, long forgotten or idly romanticized, has become the emotional focus of an international row which—behind all the rhetoric—centers on the conflicting priorities of developed and developing countries.

Reacting strongly to the international outcry, President Jose Sarney yesterday accused foreign countries of leading a "cruel and unjust campaign," based on calumnies against Brazil over the Amazon. He said the ecology issue was being used to prevent the integration of Latin American countries, and that the developed world wanted to "turn ecology into a business" through debt swaps aimed at conserving the environment.

A $350 Million Fund

In a speech announcing an environmental program called "Our Nature," he said a $350 million fund would be set up for ecological projects. Foreign contributions, he added, would be welcome, "but without conditions."

He banned the use of mercury in gold prospecting in the Amazon, and the export of logs from the area. Increased policing of the Amazon states, including use of the army was also promised, as well as an in-depth study of the region's soil.

But even if it proves to be more than empty promises, "Our Nature" is unlikely to have much impact on the conflict.

Put simply, where the developed world sees in the Amazon a vast nature reserve that could hold cures for illnesses and guarantees for the climate, the Brazilian government sees resources to be exploited—including rivers that could turn the country into the Saudi Arabia of hydropower—and space for its fast-growing population.

While U.S. scientist and environmentalist Tom Lovejoy of the Smithsonian Institute says he believes the fate of the global environment depends largely on how the Amazon is used over the next century, Brazil's former navy minister Maximiano Fonseca says bluntly that "the U.S. outcry over the Amazon is just a front to block our development."

Feelings have reached such a pitch partly because, while the Amazon and its Indians have caught the fancy of the developed world, Brazilian officials focus on the fact that the industrialized world is responsible for the overwhelming bulk of the gases causing both ozone depletion and global warming.

"Countries that are already developed can give themselves the luxury of these environmental concerns," says Silvio Rodrigues Perdo Cunha, Secretary of Planning in the western Amazon state of Rondonia. "But for many people here, deforestation equals survival."

In many ways, Rondonia — an area about the size of West Germany—typifies the complexity of the problems in Amazonia. For several months last year, fires raged as farmers burned the forest to create new pasture. The sky was so thick with smoke that the airport closed for days. Already about 23% of the state has been deforested as the state's population has grown at over 10% a year from 115,000 in 1970 to 1.5 million today. To many—and certainly to the environmentalists of the developed world—what has happened in Rondonia has been a case study in wanton devastation.

But the story is not so simple. Many of the pioneers who have come to Rondonia have been effectively forced to move from the southern states of Brazil by the spread of large-scale, mechanized farming. This has been largely dedicated to soya, exports of which have surged from $308 million in 1983 to $728 million last year. This money largely has been used to pay interest on Brazil's $115-billion foreign debt.

Why Farmers Move

"Debt contributes to the marginalization of people in the south and southeast," argues Herbert Schubart, director of the Manaus-based Amazon Research Institute, which is known by the acronym INPA. "We must export soya beans to help pay the debt and so farmers must move on. This is why we need understanding from industrialized countries."

More broadly, with its $12-billion annual foreign debt bill, Brazil is squeezed for resources. Unable to get credit to buy a tractor, farmers in Rondonia burn forest as an alternative to tilling the soil. Unable to find jobs, a population growing at 2.5% a year in a stagnant economy surges into areas like Rondonia that are now being opened up just as the American West was a century ago. Pushed to meet creditors' demands, the federal government slashes the budget, cutting environmental and research programs essential to developing the Amazon on a sustainable basis.

That is the Brazilian side of the story. But it is also clear, in Rondonia and elsewhere, that the surge into the Amazon—an area nine times the size of France and covering over half of Brazilian territory—has been grossly mismanaged.

At least two hydroelectric projects—the Samuel Dam in Rondonia and the Balbina project near Manaus—have been appallingly bungled, generating scant electricity in return for massive flooding.

Fiscal incentives, now abolished, have been foolishly used and have led to the deforestation of areas unfit for farming or ranching by big companies seeking merely to cut their tax bills. Roads have opened up new areas without any prior study of whether the soil is suited to agriculture—and most of the Amazon isn't. Gold miners have been allowed to poison the environment with mercury, and new pig-iron industries use trees as cheap fuel.

The Amazon has been left as an unpoliced Wild West, in which murders such as that of rubber-tapper Chico Mendes last December are the daily response to conflict. And, long-promised land reform, which could alleviate pressure on the Amazon by dividing up some of the country's vast estates, hasn't happened.

The "Our Nature" program will seek to rectify some of these failings. Inevitably, however, it will be plagued by scant resources.

The question remains: What can the industrialized world do to help?

The current outcry has only made that question more delicate. Feelings are running so high that even talk of debt-for-nature swaps—whereby Brazilian debt might be bought cheap by environmental organizations in the developed world and the funds used to protect the forest—is impossible because of the perception that foreigners would gain a say in the use to which sovereign territory is put.

Says Julio Glinternick Bitelli, an environment official in the Brazilian Foreign Ministry, "We accept additionality rather than conditionality. If there is genuine concern in developed countries about the environment, why not constitute a fund to transfer technology to us and help us rationally develop the rain forest?"

Representative SCHEUER. Thus, the cycle begins. We have to find ways and means of convincing developing countries that they must produce systems of resource management for their forests, grazing lands, crop lands, and wildlife management that are environmentally sustainable.

They must come to understand the phenomenon of killing the goose that laid the golden egg. They must achieve the trained infrastructure of people who will help them harvest all of their resources on a sustainable yield basis.

They must understand that they should meet their needs without draining their natural assets—their biological systems, forests, grazing lands, croplands, fauna, fisheries, and water resources.

We can turn this planet into a dust bowl or we can embark on a course of development that is socially, economically, politically, and environmentally sound.

We will explore all those concepts during the subcommittee's series of 3 days of hearings on sustainable development and economic growth in the Third World. And we're starting with the distinguished experts that are here to testify today.

We will discuss the concepts and elements of sustainable development today.

Then we will explore the relationship between Third World debt and sustainable development on June 15.

And on June 20, we will examine strategies and solutions to the dilemmas that we have explored today.

So, it's a great pleasure for me to welcome these very distinguished witnesses. Today, we'll start with Mr. MacNeill, who has played such a key role on the Brundtland Commission. He has worked there and has generated a flood of invitations and has conferred from all parts of the world.

We're delighted to have you here, today, Mr. MacNeill, to counsel with us. I think each of you should take 7 or 8 minutes.

Then, when you're all finished, I'm sure we'll have some questions for you.

Please proceed. And let me say at the outset that your complete prepared statement as you have submitted it will be printed in full in the record.

Please proceed, Mr. MacNeill.

STATEMENT OF JIM MacNEILL, PRESIDENT, MacNEILL ASSOCIATES; DIRECTOR, SUSTAINABLE DEVELOPMENT, INSTITUTE FOR RESEARCH ON PUBLIC POLICY; AND SECRETARY GENERAL, WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

Mr. MACNEILL. Thank you very much, Mr. Scheuer.

First of all, I would like to say how delighted I was to learn that this subcommittee had decided to hold a series of hearings on sustainable development and economic growth in the Third World, although I must admit that I paused for a moment when I saw that the emphasis was to be on the Third World.

There is, of course, absolutely no doubt that if the nations of the Third World are to grow at the pace and scale needed to meet the needs and aspirations of their burgeoning populations, sustainabil-

ity must become the overriding criterion of their economic, fiscal, trade and forestry, as you mentioned, and other policies.

I pause simply because the need to test national policies against the criterion of sustainability is just as great, if not greater, in the so-called Second and First Worlds; with some 20 percent of the world's population, we consume over 80 percent of the world's goods.

And if we are to slow the rate at which we are crossing certain critical thresholds, such as those related to depletion of the ozone layer or global warming or deforestation or desertification or other syndromes, the shift to sustainable forms of development must be led by the industrialized countries.

And that group of nations will move only as fast as its largest players, in particular, the United States.

We cannot, in the industrialized world, Mr. Scheuer, credibly advocate policy and institutional measures for the Third World that we are not ourselves prepared to put in place. That is the first point that I would like to make this morning.

Sustainable development embraces all of the issues that we have for a long time thought of as environmental and resource management issues. The power of the concept, as I see it, is that it integrates these issues with the traditional issues of economic growth, employment, development, trade, peace, and security.

These issues are all very compelling. They are moving rapidly to the top of political agendas all over the world. They should be, for example, a part of the mainstream debate at the forthcoming G–7 Economic Summit in Paris and this subcommittee obviously has a very important role to play in preparing the U.S. Congress and Americans to address them.

And in that regard, coming from where I come from, the news in the past 24 hours is rather encouraging.

Representative SCHEUER. Would you elaborate on that, please?

Mr. MACNEILL. I'm referring to the announcement yesterday by President Bush concerning the Clean Air Act.

Well, as you mentioned, during the 4 years ending December 1987, I had the opportunity to manage a global inquiry into the state of the world, what you, I suppose, would call an international presidential commission. It has become known as the Brundtland Commission, after our Chairman, Prime Minister Brundtland of Norway.

Mr. William Ruckelshaus is well known to you, and he was the member of the Commission from the United States.

As a Commission, we did everything that commissions are supposed to do. We contracted expert papers. We established world-scale panels. We invited world figures to meet with us.

But we also did something, Mr. Scheuer, that no previous international commission has attempted. We organized open public hearings in every region of the world, from Sao Paulo to Moscow, Jakarta to Oslo and Harare to Ottawa—in all of the regions of the world. We took evidence from nearly a thousand experts and political leaders and concerned citizens. In the process, we came face to face with the heavy contradictions between the reality of environment and development totally interlocked in the daily lives of people and of communities and of industries, and the unreality, if I

can put it that way, the unreality of distinctions that we draw between environment and development in our academic institutions, our economic and our political institutions.

Our report is entitled "Our Common Future." I have a copy of it here. It has been a great success in many countries, including my own, and in several international organizations. It is now available commercially in over 20 languages and counting.

It's quite impossible to summarize our report in a few minutes, so I will limit myself to just a few points and then leave the rest to the discussion.

First of all, I'd like to say a word about what I call the sustainability question, the question that the Commission returned to time and time again during its work.

The question basically is this:

Can growth on the orders of magnitude projected over the next one to five decades be managed on a basis that is sustainable? Economically sustainable and ecologically sustainable.

The answer is not evident, since the obstacles to sustainability are mainly social, institutional, and political. All governments and international organizations today, as you know, deal with economic and ecological sustainability as if they were two separate questions. They have organized them in separate compartments—the one, the responsibility of Ministries of Finance and a group of economic agencies, the other the responsibility of Departments of Environment or, in your case, I suppose Treasury and EPA.

But our economic and ecological systems today have become totally interlocked and sustainability is, in fact, now one question, not two.

Global warming, in a sense, is simply a form of feedback from the Earth's ecological system to the world's economic system.

The same is true of the ozone hole or acid rain in North America; soil degradation in the prairies, deforestation and species loss in the Amazon, which you mentioned, and many other phenomena.

The most critical imperative of the future as we saw it in the Commission, and certainly over the next few decades, is rapid growth. That's the most critical imperative of the future.

We estimated that a further fivefold to tenfold increase in economic activity would be required over the next 50 years in order to meet the needs and aspirations of a world population projected to double from 5 to 10 billion, as you mentioned.

And also to begin to reduce mass poverty. If we don't reduce mass poverty, Mr. Scheuer, there is really no way to stop the accelerating decline in the planet's basic stocks of ecological capital—its forests, soil species, fisheries, water, and the atmosphere.

If we are already crossing certain critical thresholds, and we are, the question is: Is there any way to multiply economic activity a further 5 to 10 times without it undermining itself and compromising the future completely? That, in short, is the sustainability question.

It concerns the industrialized world perhaps more than the Third World. But it is especially poignant in Third World countries. They face debilitating domestic trends—not just economic trends but also ecological and political trends. And a lot of evidence suggests that,

in many cases, there is a clear connection between all of these trends.

In my view, Mr. Scheuer, Third World sustainability is and will remain pie in the sky if we don't slow population growth rapidly, solve the growing debt problem, especially in Africa and Latin America, drop protectionist barriers against Third World products and increase stagnating flows of aid.

We can do all of these things. The industrialized world can do all of these things at a cost that is far less than the cost if we don't.

Most Third World countries, as I'm sure Bob Repetto will mention, most Third World countries have resource-based economies. Their stocks of environmental resources, their soils and forests and fisheries and waters and parks, form their basic economic capital.

Given population and other trends, their long-term economic development and—given the interconnection of these systems, our own development—depends on maintaining, if not increasing, these stocks, and enhancing their ability to support agriculture, forestry, fishing, mining, tourism, and so on for local use and export.

During the past several decades, as you know, these basic capital accounts have been declining at an accelerating rate. I'm sure you are familiar with the figures. The one that I tend to bear in mind is that every 10 seconds, the world's population grows by 25 people, and every 5 seconds, the planet's stock of arable land falls by 1 hectare.

Many developing countries today are in deeper ecological debt than financial debt. The consequences include not only increased hunger and death, but also social instability and conflict, as environmental degradation, resource depletion and social conflict drive refugees in their millions across national borders.

Now, Mr. Scheuer, contrary to the impression that I may have just conveyed the Commission did not get bogged down in prophecies of doom. We could easily have done so. We preferred instead to emphasize the possibility as we saw it of a new era of growth—not the type of growth that dominates today, but sustainable growth, growth based on forms and processes of development that do not undermine the integrity of the environment on which they depend.

Sustainable development is the overriding political concept of "Our Common Nature." But what is it, in fact—for a Third World country like Zimbabwe or Indonesia—or an industrial state like Norway or Canada—or a corporate empire like IBM?

There is no single answer to that question. We set out in our report some general conditions and some specific ones, which I will mention in a moment. But, the fact is that every country, community, or corporation will have to work out its own pathways to sustainable development.

The most general definition of sustainable development that we gave in our report was new paths of economic and social progress which, and I quote, "meet the needs of the present without compromising the ability of future generations to meet their own needs."

Your letter points out that many believe that this definition is much too general. And, of course, it is. But we did not stop there. We also put forward a number of specific conditions that have to be met in order for development to be sustainable. And we refer to

them in the report as "strategic imperatives for sustainable development."

Let me mention five of them very quickly, and then I will conclude.

I've already mentioned the first two: One, rapid growth, and, two, strong policy measures to achieve a more equitable distribution of the proceeds of growth within and between nations. On both of these conditions, I might say, we are at the moment moving in the wrong direction.

I regret to say that we are moving in the wrong direction on most of the other conditions as well. The third condition is strong measures to slow the rate of population growth. This requires much greater financial and research support and especially political support than it has been getting from industrialized countries.

The fourth condition is to ensure that a nation's and the planet's basic stock of natural capital does not decrease over time. This requires, among many other things, significant reform of public policies that now actively encourage deforestation, desertification, destruction of habitat and species and decline of air and water quality. These policies, Mr. Scheuer, and the often enormous budgets that they command, are much more powerful than any conceivable measures to protect environments or to restore and rehabilitate those that have already been destroyed. Unless and until these policies are reformed—and our OECD agricultural and trade policies are a case in point—unless and until these policies are reformed, nations will not be able to keep up with, let alone catch up with, the increasing rates of depletion of their natural capital.

The fifth condition for sustainability that we stress throughout the report is a rapid reduction in the energy and resource content of growth. This condition is essential if the industrialized world is to play the leading role that it must play is slowing the rate of global warming and addressing other threats to Third World development and to global security.

But, again, we are moving in the other direction at the moment. A large number of subsidy, tax, and pricing policies are on the books of all countries that actively encourage an increase in the use of fossil fuels and in CO_2 and other emissions, for example. These policies must be reformed, employing pricing and regulatory measures as well as measures to induce institutional innovation.

The last, and I think the most important, condition that we discuss in the report—we devote an entire chapter to it—is what we call merging environment and economics in decisionmaking.

Our economic and ecological systems today are totally interlocked in the real world, but they remain almost totally divorced in our institutions and our policies.

Environmental agencies must be given more capacity and more power to cope with the effects of unsustainable development, but in our view, the most urgent task was and is to make our central economic trade and sectoral agencies directly responsible and accountable for ensuring that their policies encourage development that is sustainable.

We need to look at market incentives and make them work in favor of sustainable development. We need to modify national economic accounting systems to reflect changes in stocks and re-

sources of environmental capital. And we need many other measures.

In this regard, Mr. Scheuer, you might be interested to know that some governments have, and other governments are considering, directed their economic agencies to conduct an audit of their policies against the recommendations in our report, and also against the criteria for sustainable development that I have mentioned—and then report back to either the Cabinet or the Parliament by a certain date. That may be something that this subcommittee would like to consider.

One last word. The Commission argued very strongly that the environment and sustainable development must be treated as a foreign policy issue of paramount importance. There is obvious potential for real tension over these issues, especially if the failure of certain countries to address them becomes seen as a real threat to the security of neighboring and other countries. On the other hand, Mr. Scheuer, if they are properly approached, these issues could force a new spirit of international cooperation and some fresh thinking about multilateral approaches to other issues.

Thank you very much.

[The prepared statement of Mr. MacNeill, together with an attachment, follows:]

PREPARED STATEMENT OF JIM MacNEILL

Sustainable Development: What is it?

I was delighted to learn that this Committee had decided to hold a series of hearings on "Sustainable Development and Economic Growth in the Third World", although I must admit that I paused for a moment when I saw that the emphasis was to be on the "Third World". There is no doubt that if the nations of the Third World are to grow at the pace and scale needed to meet the needs and aspirations of their burgeoning populations, *sustainability* must become the overriding criterion of their economic, fiscal, trade, aid, energy, food and other sectoral policies. I paused because the need to test national policies against the criterion of *sustainability* is just as great, if not greater, in the Second and First Worlds. With some 20 percent of the world's population, we consume nearly 80 percent of the world's goods. If we are to slow the rate at which we are crossing certain critical thresholds, such as those related to depletion of the ozone layer, global warming and acidification, the shift to sustainable forms of development must be led by the industrialized countries. And that group of nations can and will move only as fast as its largest players, in particular the United States. We cannot credibly advocate policy and institutional measures for the Third World that we are not ourselves prepared to put in place. And that is the first point I want to underline.

Sustainable development embraces all of the issues that we have long thought of as environmental and resource management issues, and the power of the concept is that it integrates them with the traditional issues of growth, employment, development, trade, peace and security. These issues are compelling. They are moving rapidly to the top of political agendas all over the world. They should be part of the mainstream debate at the forthcoming G7 Economic Summit in Paris. This Committee obviously has a very important role to play in preparing the US Congress and Americans to address them.

The World Commission on Environment and Development

During the 4 years ending in December, 1987, I had opportunity to manage a global enquiry into the 'state of the world' - a sort of 'international royal commission', or what you might call a "Presidential Commission". It has become known as the "Brundtland" Commission, after our Chairman, Prime Minister Gro Harlem Brundtland of Norway. Mr. William Ruckelshaus, who is well known to you, was the member of the Commission from the United States.

We did everything that Commissions are supposed to do. We contracted papers, established panels, and invited world figures to meet with us. But we also did something that no previous international commission has attempted to do. We organized open public hearings in every region of the world, from Jakarta to Moscow, Sao Paulo to Oslo, Harare to Ottawa. We took evidence from nearly a thousand experts, political leaders and concerned citizens on five continents and, in the process, we came face to face with the heavy contradictions between the reality of environment and development - totally

interlocked in the daily lives of people, industries and communities - and the unreality of the distinctions between them made in our academic, economic and political institutions.

Our report, entitled "Our Common Future", was very timely, and it has already had a significant impact in many countries, including my own, and in several international organizations. It's now available commercially in 20 languages - soon 26.

The Sustainability Question

A lot of people today are wrestling with the concept of 'sustainable development'. Just what does it mean?

Some years ago, various institutes around the world began to look at the whole relationship between environment and the economy. The OECD, when I joined it as Director of Environment in the late '70s, took this up as a major theme of its program. The World Commission carried the concept a lot further and tried to put it together in a single report.

Your letter stated that "the major objective of this first hearing .. is to define sustainable development in such a way that it encompasses economic growth ....". The essential corollary of that objective, of course, is: 'to define economic growth in ways that meet the criteria of sustainability'. But what are these criteria?

First, a word about sustainability itself. During its three years of work, the Commission returned constantly to what I called "the sustainability question" - Can growth on the orders of magnitude projected over the next 1-5 decades be managed on a basis that is sustainable, economically and ecologically?

The answer is not evident, since the obstacles to sustainability are mainly social, institutional and political. Economic and ecological sustainability are still dealt with as two separate questions in all governments and international organizations, where they are organized in separate compartments such as ministries of finance and departments of environment, or your Treasury and EPA. But our economic and ecological systems are now interlocked. Global warming is a form of feedback from the Earth's ecological system to the World's economic system. So is the ozone hole, or acid rain in Europe and Eastern North America, or soil degradation in the prairies, deforestation and species loss in the Amazon, and many other phenomena.

The world's population has multiplied more than three times since 1900. Its economy has expanded 20 times. The use of fossil fuels has grown by a factor of 30, and industrial production by a factor of 50, four-fifths of this since 1950. The gains in human welfare have been breathtaking, and the potential for future gains is ever more awesome.

The processes that produced these gains have also produced trends that raise serious questions about their sustainability. Even so, the most critical imperative of the next few decades is further rapid growth. We estimated that a further five to ten-fold increase in economic activity would be required over the next 50 years in order to meet the needs and aspirations of a world population projected to double in that period from 5 billion to 10 billion. And to begin to reduce mass poverty. If we don't reduce mass poverty, there really is no way to stop the accelerating decline in the planet's basic stocks of ecological capital, its forests, soils, species, fisheries, waters and atmosphere.

Mass poverty will not be reduced without significant economic growth. If we are to achieve sustainable development during the first part of the next century, we must aim at two things in the Commission's view: first, a minimum of 3 percent per capita national income growth and second, vigorous policies to achieve greater equity within developing countries.

Growth, Distribution and Poverty

How quickly can a developing country expect to eliminate *absolute* poverty? The answer will vary from country to country, but much can be learned from a typical case.

Consider a nation in which half the population lives below the poverty line, and where the distribution of household incomes is as follows: The top one-fifth of households have 50 percent of total income, the next fifth have 20 percent, the next fifth 14 percent, the next fifth 9 percent, and the bottom fifth have just 7 percent. This is a fair representation of the situation in many low income developing countries.

Consider two cases, one in which 25 percent of the incremental income of the richest one-fifth is redistributed equally to the others, and one in which there is no redistribution of increases in income. The number of years required to bring the poverty line down from 50 percent to 10 percent ranges from:

- 18-24 years, if per capita income grows at 3 percent,
- 26-36 years, if it grows at 2 percent,
- 51-70 years, if it grows only at 1 percent.

So with per capita income growing at only 1 percent a year, the time required to eliminate absolute poverty would stretch well into the next century. If the aim is to assure that the world is well on its way to sustainable development during the first part of the next century, it is necessary to aim at two things: a minimum of 3 percent per capita national income growth, *and* vigorous policies to achieve greater equity within developing countries. *From Our Common Future, pg 50.*

A five to ten-fold increase in economic activity sounds enormous but, because of the magic of compound interest, it represents annual growth rates of only 3.2 and 4.7 percent. What government of any country, developed or developing, doesn't aspire at least to that! In fact, in developing countries, growth at these rates is hardly enough to keep up with projected population growth, let alone reduce current levels of poverty.

If we are already crossing a number of critical thresholds, is there any way to multiply economic activity a further 5 to 10 times, without it undermining itself and compromising the future completely? That is the sustainability question.

Resource Dependence of Selected Developing Countries

	Agricultural Prod as a % of GDP		Employment in Agriculture as a % of total Employment		Exports of Primary Products as a % of Total Exports	
Low Income Economies	1965	1986	1965	1980\	1965	1986
Burma	35	48	64	53	99	87
China	39	31	81	74	54	36
India	47	32	73	70	51	38
Sri Lanka	28	26	56	53	99	59
Ethiopia	58	48	86	80	99	99
Ghana	44	45	61	56	98	98
Kenya	35	30	86	81	94	84
Senegal	25	22	83	81	97	71
Tanzania	46	59	92	86	87	83
Middle Income						
Bolivia	23	24	54	46	95	98
Columbia	30	20	45	34	96	82
Costa Rica	24	21	47	31	84	65
Indonesia	56	26	71	57	96	79
Thailand	35	17	82	71	95	58
Nigeria	53	41	72	68	97	98
Zimbabwe	18	11	79	73	71	64

The agricultural sector comprises agriculture, forestry, fishing and hunting. Primary products, in addition to agriculture, includes fuels, minerals and metals. Compiled from World Bank, World Development Report, 1988, Oxford University Press, 1988.

It concerns the Industrialized World perhaps more than the Third, but it is especially poignant in Third World countries. They face debilitating domestic trends, not just economic, but also ecological and political, and a lot of evidence suggests that in many cases there is a clear connection between them. Population growth is outstripping economic growth in many of them, and two-thirds have suffered a fall in per capita income, in some as great as 25 percent. The growing debt problem, especially in Africa and Latin America, and deteriorating terms of trade, including unstable commodity prices, growing protectionism in developed market economies, and stagnating flows of aid all combine to force attention on short term crisis, rather than longer term development.

Most Third World countries have resource-based economies. Their stocks of environmental resources - their soils, forests, fisheries, species, waters and parks - form their basic economic capital. Given population and other trends, their long-term economic development depends on maintaining, if not increasing, these stocks and enhancing their ability to support agriculture, forestry, fishing, mining, and tourism for local use and export.

During the past several decades, however, these basic capital accounts have been declining at an accelerating rate. You are familiar with the figures. Every 10 seconds the world's population grows by 25 people; every 14 seconds, the planet's stock of arable land falls by one hectare. Many developing countries are today in deeper ecological debt than financial debt: The consequences include not only increased hunger and death, but also social instability and conflict, as environmental degradation and resource depletion and social conflict drives refugees in their millions across national borders.

Sustainable Development

The Commission did not come out of the environment corner, exclusively, or even mainly. It was composed of ministers and ex-ministers of finance, agriculture, energy, population, foreign affairs, as well as people with strong industry background, scientists and, of course, some environmentalists. I think it is fair to say that our main concern was development. And after looking at the evidence, we concluded that growth on the scale needed cannot be sustained if it rests on a continuing draw-down of the Planet's basic ecological capital.

We did not get bogged down in prophecies of doom, although we could easily have done so. We preferred instead to emphasize the possibility, as we saw it, of a "new era of growth", not the type of growth that dominates today, but sustainable growth, growth based on forms and processes of development that do not undermine the integrity of the environment on which they depend.

Sustainable development is the over-riding political concept of 'Our Common Future'. But what is it? Let me be general and then more specific, bearing in mind that the concept has to be applied by every government, corporation and community to its own unique circumstances.

We define sustainable development in ethical, social and economic terms. Most generally, we defined it as new paths of economic and social progress which "meet the needs of the present without compromising the ability of future generations to meet their own needs".

Your letter points out that many believe that this definition is much too general and, of course, it is. But we did not stop there. We also put forward a

number of criteria, or conditions that have to be met in order for development to be sustainable. We referred to them as "strategic imperatives for sustainable development".

Strategic Imperatives for Sustainable Development

1. **Reviving growth to meet human needs and aspirations.**
2. **Ensuring a more equitable distribution of the proceeds of 'growth, within and between nations.**
3. **Ensuring a sustainable level of population.**
4. **Conserving and enhancing the resource base.**
5. **Reducing the energy and resource content of growth.**
6. **Re-orienting technology and managing risk.**
7. **Merging environment and economics in decision-making.**

In addition, of course, the Commission stresses throughout that sustainable development depends on a political system that ensures effective citizen participation in decision-making, in other works, human rights and democracy; an economic system that is able to generate surpluses on a sustainable basis; and an administrative system that is flexible, with a built-in capacity for self-correction. In this regard, developments in a number of countries, especially in Latin America and Asia, are encouraging.

Growth and Equity

I have already mentioned the first two imperatives for sustainability - 1) **rapid growth to meet human needs and aspirations, and reduce poverty - and 2) strong policy measures to achieve a more equitable distribution of the proceeds of growth, within and between nations.** On both conditions, we are at the moment moving in the wrong direction.

As you know, the most skewed distribution of income and power is to be found in the poorest nations, but the distribution of income between the rich nations and the poor nations is just as grotesque. And it is getting worse. The traditional net flow of capital from the industrial to developing countries was reversed in 1982. Over $43 billion annually is now transferred in the other direction. And that is only what the World Bank counts. In addition, today's trading patterns contain a massive transfer of the environmental costs of global GNP to the poorer resource-based economies of the Third World. A study conducted for the Commission estimated these costs at about $14 billion a year - more than one third of the total amount of development assistance flowing annually

in the other direction. And that $14 billion is a low estimate because it only includes the costs related to environmental pollution, not those related to resource depletion.

Public and Private Long-Term Debt and Financial Flows in Developing Countries, 1982-88 (US$ billions)

Long-Term Debt and Financial Flows	1982	1983	1984	1985	1986	1987	1988
Debt Disbursed and Outstanding	562.5	644.9	686.7	793.7	893.8	996.3	1020.
Debt Service	98.7	92.6	101.8	112.2	116.5	124.9	131.
Principal Payments	49.7	45.4	48.6	56.4	61.5	70.9	72.
Interest Payments	48.9	47.3	53.2	55.8	54.9	54.0	59.
Net Flows	67.2	51.8	43.0	32.9	26.2	15.8	16.
Net Transfers	18.2	4.6	-10.2	-22.9	-28.7	-38.1	-43.

Compiled from World Bank, "World Debt Tables, External Debt of Developing Countries", 1988-89 Edition, The World Bank, Washington, D. C.

Ensuring a Sustainable Level of Population

The third imperative is strong measures to slow the rate of population growth and bring and hold them at sustainable levels. This is fundamental. I am sure that other witnesses will be dealing with it, so I will limit myself to two points.

First, the issue is not simply one of numbers. A child born in a rich industrialized country, where levels of energy and material use are high, places a much greater burden on the planet than one born in a poor country. The industrialized world found that development is the best means of population control. It has even proved capable of negative rates of population growth, when accompanied by urbanization, rising levels of income, improved education, and the empowerment of women.

Second, similar processes are at work in some developing countries.[1] In addition, many are beginning to take strong direct measures to bolster social, cultural and economic motivations for couples to have small families and, through family planning programs, to provide all those who want them with the education, technological means and services required to control family size. But time is short and these efforts should be encouraged. They require much greater financial and research support, and especially political support, than they have been getting from industrialized countries. Here again, we seem to be moving in the other direction. I was disappointed, for example, to read in the New York

[1]Nafis Sadik, 'Investing in Women', Statement to United Nations Population Fund, Helsinki, 12 May, 1989.

Times of June 7, that the United States has decided again to withhold its annual contribution to the United Nations Population Fund.

Conserving and Enhancing the Resource Base

Another essential condition for sustainable development is that a community's or a nation's basic stock of natural capital should not decrease over time. A constant or increasing stock of natural capital is needed not only to meet the needs of present generations, but also to ensure a minimum degree of fairness and equity with future generations.[2]

This condition can be applied to renewable resources, but what does it mean for non-renewable resources? By definition, use must reduce the capital available. With some major exceptions such as oil and gas, it seems unlikely that the use of most non-renewable resources will be limited by supply. Instead, their use will be limited by their impact on renewable resources. The extraction, use and disposal of non-renewable resources should take into account their impact on other resources, such as the atmosphere, and should foreclose as few options as possible. The rates of depletion of non-renewable resources should also take into account the criticality of the resource, the availability of technologies for minimizing depletion, and the likelihood of substitutes being available.

Can the world's expanding economies begin to live off the interest of the Earth's stock of renewable resources, without encroaching on its capital? At the moment, we are moving backwards at an accelerating pace, but the question is open. If the annual draw on the Earth's basic economic capital is to be brought within the capacity of natural systems to generate it, the industrialized world will need to increase by several orders of magnitude its support for strategies aimed at abating pollution, at protecting and preserving essential resource capital, and at restoring and rehabilitating those assets that already depleted and exhausted. There are several cases in point - for example, National Conservations Strategies, the Tropical Forests Action Plan.

Much more important, however, we need to begin to reform the public policies that sometimes unintentionally, but actively, encourage deforestation, desertification, destruction of habitat and species, decline of air and water quality. These policies, and the often enormous budgets they command, are much more powerful than any conceivable measures to protect environments or to restore and rehabilitate those already damaged. Unless and until these policies are reformed, nations will not be able to keep up, let alone catch up, with the increasing rates of depletion of their natural capital.

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[2]For a most recent summary and update of the work of the WCED (1987), Repetto (1986), Redclift (1987), Turner (1988), see David Pearce, Edward Barbier and Anil Markandya, *Sustainable Development: Economics and Environment in the Third World*, London Environmental Economics Centre, Edward Elgar Publishing Ltd, Feb, 1989.

Take agriculture, for example. The challenge of the next few decades is to shift global agricultural production to where the growing demand is. Several countries in Asia have made impressive gains and other governments, including some in Africa and Latin America, have begun to change local 'terms-of-trade' in favour of rural areas, through reduced urban food subsidies, higher prices and better incentives for farmers. Others are tackling land reform, which is essential to reduce pressure on marginal resources by millions of landless poor.

Whether these efforts can be sustained politically depends on a range of factors which can be undermined by the competitive dumping of western surpluses. Third World governments are seldom able to resist subsidized or non-emergency food aid. Apart from always pressing need, it relieves the political pressures on them to reform their own agricultural policies, many of which are equally perverse. Third World farmers bear much of the brunt of the resulting inaction. Even the most efficient are unable to compete with rich-country surpluses dumped at subsidized prices. In the absence of policy reform, large numbers of rural poor remain in marginal environments longer than they otherwise would, over-harvesting fuelwood stocks and grasslands, and sometimes eating next year's seed corn.

These policies are not sustainable and they should be changed. The industrial market economies of OECD need to revamp their existing structure of farm subsidies, which now costs public treasuries nearly $300 billion a year. These subsidies not only generate vast surpluses at great economic and ecological cost. They also generate political pressures in North America and Europe for still more subsidies to increase exports, to donate food to Third World countries as non-emergency assistance, and to raise trade barriers against imported food products in which Third World countries have a clear comparative advantage.[3]

These subsidies can be re-deployed in ways that not only maintain farm income - which is vital for sustainable agriculture - but also encourage farmers to adopt practices that enhance their essential soil and water base rather than deplete it. Assistance to developing countries can be provided in ways that support essential domestic reforms to increase production and to reverse accelerating degradation of their resource base.

Government policies today also abound in incentives to overcut the world's forests, and western trade and aid policies often re-inforce those in developing countries

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[3]For a full discussion of ecologically perverse agricultural policies and their reform see: *Food 2000, Global Policies for Sustainable Agriculture*, the Report of the Advisory Panel on Food Security, Agriculture, Forestry and Environment to the The World Commission on Environment and Development, Zed Books Ltd, London, 1987. Also, The World Commission on Environment and Development, *Our Common Future*, Oxford University Press, 1987. Chapter 5; and the World Bank, *World Development Report, 1986, Part II, Trade and Pricing Policies in World Agriculture*, Oxford University Press, Oxford, 1986.

that encourage the destruction of tropical forests. There is no use preaching to the Indonesians or Brazilians about ecologically perverse subsidies until we get our own house in order. Only then will we be in a credible position to call upon developing countries to follow suit. I understand, for example, that you are about to subsidize the destruction of the Tongass in Alaska.

Many developing countries employ a range of tax and other incentives to encourage large companies, cattle ranchers, small scale farmers and other settlers to exploit or to settle in and around tropical forests. Between 1965 and 1983, for example, Brazil is reported to have spent $600 million on tax credits to subsidize the development of large cattle ranches.[4] The world's forest trade is also marked by perverse incentives which encourage the overharvesting of temperate as well as tropical forests. If these incentive systems stay, it is very doubtful that the world's remaining forests can survive, with all that implies for food security, deserts, flooding, and global warming.

Reducing the Energy and Resource Content of Growth

A rapid reduction in the energy and resource content of growth is another essential condition of sustainable development - and number 5 on our list. During the past couple of decades, the link between GNP and energy growth has been broken, as has the link between GNP growth and growth in water, steel, aluminum, cement, some chemicals and many other materials. The link between growth and environmental emissions and resource depletion has consequently also been broken.

Nowhere has this been more marked than in energy. Following the first oil shock, between 1973 and 1983, OECD nations improved their energy productivity on average by 1.3 percent annually.[5] Prior to the last oil shock, that is the sharp fall in prices, some countries, including Japan and Sweden, had reached productivity increases of more than 2.0 percent per annum.

Three points. First, meeting this condition is essential if the industrialized world is to play the leading role it must play in slowing the rate of global warming and addressing other threats to Third World development and global security. The Commission concluded that steady annual increases in energy productivity would be necessary in order to slow global warming, reduce acidification and urban air pollution. Again, we are moving in the other direction, with subsidy, tax and pricing policies that increase the use of fossil fuels and CO2 and other emissions.

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[4] *World Resources 1988-89, An Assessment of the Resource Base that Supports the Global Economy*, op cit, pg 10.

[5] *Our Common Future*, op cit, pg 216.

Second, improved macro-economic efficiency is another way to express this condition for sustainable development. Increasing energy and resource efficiency at the level of industrial plants or communities adds up to increasing the efficiency of the national economy. When industry, agriculture and local communities achieve higher levels of resource and environmental productivity, the national economy in which they operate becomes more competitive. The difference in energy intensity alone between the U.S. and Japanese economies, for example, creates a cost advantage of the order of 5 percent for the typical Japanese export.[6]

Energy Intensity of Selected National Economies, 1973-85

Country	1973	1979	1983	1985	Change 1973-85
	(megajoules per 1980 dollar of GNP)				
Australia	21.6	23.0	22.1	20.3	-6
Canada	38.3	38.8	36.5	36.0	-6
Italy	18.5	17.1	15.3	14.9	-19
Japan	18.9	16.7	13.5	13.1	-31
Netherlands	19.8	18.9	15.8	16.2	-18
Turkey	28.4	24.2	25.7	25.2	-11
United Kingdom	19.8	18.0	15.8	15.8	-20
United States	35.6	32.9	28.8	27.5	-23
West Germany	17.1	16.2	14.0	14.0	-18

Source: International Energy Agency, Energy Conservation in IEA Countries, OECD, Paris, 1987. Compiled by WorldWatch, Washington, D.C.

Third, countries that have already achieved considerable progress in this direction are at the top of the international list of economic performers. Between 1973 and 1984, the energy and raw material content of a unit of Japanese production dropped by 40 percent.[7] Sweden, West Germany and some other countries did as well or better.[8]

The non-market economies of Eastern Europe did not share in this efficiency revolution. Neither did many developing countries, including most of the OPEC nations. If governments of developing countries don't give a much higher priority to measures to encourage more efficient forms of energy and industrial development, it is hard to see how they will reverse the increasing pollution and depletion of the resource base they now

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[6]Amory B. Lovins, 'Energy, People and Industrialization', Interaction Council, High Level Expert Group on Ecology and Energy Options, Montreal 29-30 April, 1989, Rocky Mountain Institute, January, 1989.

[7]*Our Common Future*, op cit, pg. 216, 1987.

[8]Udo E. Simonis et al, 'Structural Change and Environmental Policy, Empirical Evidence on Thirty-One Countries in East and West', Science Centre, Berlin, July 1988.

confront. Moreover, their economies will be unable to compete in the international marketplace if they continue to attract industries that use high levels of energy and resources per unit of output, and that are inefficient and polluting.

The Toronto Conference last year concluded that the industrialized world would have to take the lead in reducing fossil fuel emissions to stabilize the atmosphere. It proposed that they agree upon an initial target of 20 percent reduction by 2005. Achieving this will require the use of some politically difficult policy levers. One, energy pricing. High energy prices drove the productivity gains made by OECD countries between 1973-83. The Commission proposed that countries consider what we called "conservation pricing" during periods of low real energy prices, such as prevail at present. This would entail the use of consumer taxes to maintain prices at levels high enough to induce steady annual gains in energy productivity. Two, improved regulation, in particular regulation to mandate a steady improvement in the efficiency of energy appliances and technologies, from electrical motors to air conditioners, building design and automobiles and transportation systems. It is interesting to note that in some countries that scored large gains, such as Sweden, exposure to high world energy prices was reinforced by such regulation. Three, institutional innovation, in particular measures to break utility supply monopolies and to re-organize the energy sector into industries to market end-use energy services on a competitive, least-cost basis.

Demand reduction through energy efficiency would buy time to develop renewables, including substitutes for fuelwood in developing countries. This is urgent. The FAO estimates that if population-driven overharvesting of fuelwood continues at the present rate, within a decade some 2.4 billion people may be living in areas where wood 'is acutely scarce or has to be obtained elsewhere'. [9] Solar electric, wind, recycling waste biomass, biomass digestors to make gas and liquid fuel, mini-hydro turbines are a few of many renewable technologies with enormous potential. Realizing that potential will require a significant shift in research and development from conventional to new sources.

In most countries, existing subsidy and regulatory structures promote the very opposite of what is needed for a sustainable energy future. They ignore external costs, favour waste and inefficiency and underwrite traditional sources of power - coal, oil and nuclear - rather than renewables. In doing so, they impose enormous burdens on already tight budgets, and on often-scarce reserves of foreign currency.[10] The Commission urged that governments examine all hidden and overt subsidies, and reform those that penalize conservation and end-use efficiency, and that retard the development of new and renewable energy resources, especially substitutes for fuelwood. Industrialized countries could deploy many policies, especially trade and aid policies, to actively promote the transfer to

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[9] FAO, 'Fuelwood Supplies in Developing Countries', Forestry Paper No. 42, Rome 1983.
[10] M. Kosmo, *Money to Burn? The High Cost of Energy Subsidies*, World Resources Institute, Washington, D. C. 1987.

developing countries of advanced industrial processes and technologies that are more energy and resource efficient, less polluting of the environment, and hence more economically competitive. Given proper incentives, industry itself could play a more effective role.

Merging Environment and Economics in Decision-Making

The last but most important condition for sustainable development is merging environment and economics in decision-making".[11] Our economic and ecological systems have become totally interlocked in the real world, but they remain almost totally divorced in our institutions and our policies.

During the '60s and '70s, governments in over 100 countries, developed and developing, established special environmental protection and/or resource management agencies. They invariably failed, however, to make their powerful central economic and sectoral agencies in any way responsible for the implications of their policies and expenditures on the environment. Yet, these are the agencies with the policy power and the budgets to determine the form and content of growth and, consequently, the options for the future.

The resulting balance of forces has been grotesquely unequal. Environmental agencies were added on to bureaucracies with limited mandates, limited budgets and little or no political clout. They must now be given more capacity and more power to cope with the effects of unsustainable development policies. The most urgent task, however, is to make our central economic, trade, and sectoral agencies directly responsible and accountable for ensuring that their policies - and the budgets they command - encourage development that is sustainable. Only in this way will the ecological dimensions of policy be considered at the same time as the economic, trade, energy, agricultural, and other dimensions - on the same agendas and in the same national and international institutions.

Changing Market Incentives

Although the market is limited in many ways - it can't, for example, deal directly with externalities - it is the most powerful instrument available for driving development. Whether it encourages and supports sustainable or unsustainable forms of development is largely a function of policy.

Government intervention today distorts the market in a variety of ways that pre-ordain unsustainable development. Several studies available to the Commission, and since published, document how certain kinds of economic policies drive unsustainable development patterns, unintentionally, of course. These include tax and fiscal incentives,

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[11] *Our Common Future*, op cit, pg 62.

pricing and marketing policies, and certain kinds of international economic policies such as exchange rate and trade protection policies. Those responsible for these policies seldom consider their impact on the environment or on stocks of resource capital. When they do, they often assume subsidies from these resources on the implicit assumption that they are inexhaustible.

The same is true of certain kinds of sectoral policies, as is evident from the examples cited. Food subsidies introduced to satisfy the needs of urban dwellers, can reduce farm income, increase poverty pressures on soils, wood and water - and increase rural migration to the cities.[12] Pesticide subsidies can promote excessive use and thereby threaten human health, pollute water and increase the number of pesticide-resistant species.[13] Subsidies for water resource development and water use can lead to overuse for irrigation, industrial and municipal purposes.[14] Energy subsidies can, and usually do, favour large supply projects and undermine funding for biomass and renewables.[15] Tax concessions for logging, settlement and ranching can accelerate deforestation, species loss, soil and water degradation.[16]

A nation's annual budget is perhaps the most important environmental policy statement that any government makes in any year. It establishes the framework of economic and fiscal incentives and disincentives within which corporate leaders, businessmen, farmers and consumers make decisions which either enhance or degrade the nation's environment, or increase or reduce its stocks of ecological capital. Taxes on fossil fuels, automobiles and other products, and depreciation allowances for resource development are a few of dozens of examples that might be cited.

Resource Accounting

Governments will never be able to monitor their progress toward sustainable development until they modify their national economic accounts to reflect changes in their stocks of resource and environmental capital. Science is providing increasingly powerful tools to measure these changes and economists have been developing practical, if approximate, methods of valuating them.

At the moment, these systems of economic accounting are concerned mainly with the flow of economic activity. Changes in stocks of ecological capital are largely ignored.

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[12]World Bank, *World Development Report, 1986*, Oxford University Press, 1986.

[13]R. Repetto, *Paying the Price: Pesticide Subsidies in Developing Countries*, World Resource Institute, Washington, D. C., 1985.

[14]R. Repetto, Appropriate Incentives in Public Irrigation Systems, World Resource Institute, Washington, D. C., 1986.

[15]M. Kosmo, *Money to Burn? The High Cost of Energy Subsidies*, op cit.

[16]Repetto R., *The Forests for the Trees? Government Policies and the Misuse of Forest Resources*, World Resources Institute, Washington, D. C., May 1988.

But governments and citizens need to know whether reported 3-5-7% increases in GDP are real increases, or whether they reflect a corresponding or greater declines in stocks of soils, forests, fisheries, waters, and the nation's patrimony of parks and historic places.[17] With this information, those in treasuries or finance ministries can get not only a more accurate picture of economic performance, but also useful feedback from the ecological system, enabling them to consider adjustments in relevant policies and reflect them in their annual budget, state of union address or other appropriate instruments.

Basic work on resource accounting and on techniques to change systems of national accounts and reporting using both economic and physical units in a mixed accounting framework has been done in France, Norway, Canada, the U.S.A, and some other countries. OECD and a number of independent institutes are currently involved in advancing this work, and some institutes in developing countries have expressed a keen interest in it.

Financing Sustainable Development

The Commission recommended substantial increases in multilateral and bilateral assistance for institutional development and for strengthening programs to enhance the resource base for development. Marshalling sufficient investment for these purposes will require further initiatives, and it suggests serious consideration of a special international conservation banking program or facility linked to the World Bank. Such a facility could provide loans and facilitate joint financing arrangements for the protection and sustainable development of critical habitats and ecosystems, including those of international significance. A feasibility study is now underway, coordinated by the World Resources Institute in Washington, and should be completed soon.[18]

The Commission also considered several possible international sources of revenue for financing action in support of sustainable development. These included revenues from the use of the international commons and taxes on trade in certain commodities. Although they may seem politically unrealistic at present, global trends are such that the realities of politics will change.

In fact, this may already be happening. Last June in Toronto, the World Conference on "The Changing Atmosphere: Implications for Global Security", hosted by the Government of Canada, called upon governments to establish a World Atmosphere Fund to mobilize a substantial part of the resources needed to assist developing countries to limit and adapt to the consequences of global warming and sea level rise. It proposed that

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[17] It is of interest to note that the National Task Force, echoing a recommendation of the WCED, called upon the Government of Canada to institute a system of resource accounting as a matter of urgency.

[18] The study is supported by the United Nations Development Program (UNDP) and the office of US Aid for International Development (AID), the Canadian International Development Agency (CIDA), and several foundations.

the Fund be financed in part by a levy on the fossil fuel consumption of industrialized countries - in effect, a climate protection tax. Others have proposed that the tax should be related to the carbon content of fuels. Most recently, the Norwegian Government proposed that, as a starting point, industrialized countries allocate 0.1 percent of their GNP to the Fund.[19]

It has also been suggested that major fossil fuel consumers like power utilities proposing to build new plants, should support afforestation projects to offset the increased carbon load they would place on the atmosphere. Adding the cost to the price of electricity, steel, aluminum or automobiles would internalize a part of the external environmental costs of global warming. One US company has already decided to do this. The Netherlands Government is currently assessing the various options for financing and managing a fund, in preparation for an international conference in the Hague this fall.

Military expenditures also represent an enormous pool of capital, human skills and resources, and much of it could be usefully shifted to more productive purposes. Nations spend nearly $1 trillion a year on military security, more than $2.7 billion a day. Developing countries have increased their arms budgets five-fold in 20 years, and some are spending more on their military than on education, health, welfare and the environment combined.

Some see hope for such a shift in the growing awareness of some major political leaders that environmental destruction on the present scale presents as great a threat to the security of many countries and of the planet as do hostile armies. The Commission argued that the world community needs a new and broader concept of security, one that includes environmental as well as economic and political security.[20] With a broader approach to security and security assessment, nations would begin to find many instances in which their security could be enhanced more effectively through expenditures to protect, preserve and restore basic environmental capital assets than through expenditures for arms.

The Commission argued that environment and sustainable development must be treated as a foreign policy issue of paramount importance. There is potential for real tension over these issues, especially if the failure of certain countries to address them were seen as a real threat to the security of neighbouring and other countries. On the other hand, if properly approached, they could force a new spirit of international cooperation - and fresh thinking about multilateral approaches to other issues.

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[19]Gro Harlem Brundtland, 'Global Change and Our Common Future', The Benjamin Franklin Lecture, Smithsonian Institution, Washington, D.C., May 2, 1989.

[20]*Our Common Future*, op cit, Chapter 11, Peace, Security, Development and the Environment.

THE UNITED NATIONS SYSTEM: In the autumn of 1987, the 42nd session of the UN General Assembly adopted by consensus a resolution on 'Our Common Future', which called upon all UN organs to review their work to see how they contributed to the goal of sustainable development, and also called upon governments and NGOs to take on board the Report's recommendations. The Secretary-General was asked to submit to the General Assembly's 43rd session a progress report on the implementation of the resolution and it was agreed that a full debate on follow-up on the Report would be held during the 44th Session.

UN agency heads met in July 1988 with Prime Minister Brundtland to discuss the integration of the Report's recommendations into the planning of all UN agencies, and a special task force was set up within the Secretary General's cabinet to oversee and coordinate this work.

The UN Environment Programme also plays a key coordinating role in this work, and has made sustainable development a main theme of its 'System-wide Medium-term Environment Programme, 1990-1995', which sets out the environmental responsibilities of all UN agencies. WHO, ILO, UNDP, FAO, and most of the regional economic commissions have either begun or will soon begin sweeping reviews of their policies in light of the Brundtland recommendations. The World Bank has significantly revised its capabilities to deal with environment and resource questions and has pronounced itself to be 'in the business of sustainable development'. (See Index section on UN system.)

GOVERNMENTS: Norway has established a committee of cabinet ministers to compare the Report's recommendations to present governmental practices and to change practices where necessary. The governments of Canada, the Netherlands, Denmark, Indonesia, Finland, Hungary, Japan, and the United Kingdom have also produced official responses of various types. The 'Group of Seven' summit meeting in Toronto this year in commending the work of the Commission endorsed the concept of sustainable development.

The Canadian government also organized an international conference on 'The Changing Atmosphere: Implications for Global Security' in Toronto in June, 1988, with Prime Ministers Brundtland and Mulroney of Canada participating. The delegates, representing science, politics and economics, concluded that, in the area of atmospheric pollution, 'Humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a nuclear war'. (See Index section on governments.)

INTERGOVERNMENTAL ORGANIZATIONS: There has been similar activity among most of the main intergovernmental bodies. The Inter-Parliamentary Union debated the Report during its bi-annual conference in Guatemala, passing various resolutions on it. The Environmental Committee of the OECD has proposed an inter-departmental review to compare the Report's recommendations to present OECD procedures. The European Parliament will hold a two-day seminar in Copenhagen on 9-10 November to discuss the Report.

The Third ASEAN Ministerial Meeting on Environment in Jakarta in October 1987 issued the Jakarta Resolution on Sustainable Development calling on all ASEAN governments to adopt the principle of sustainable development in their planning. (See Index section on intergovernmental activities.)

NON-GOVERNMENTAL ORGANIZATIONS: The activities of the non-governmental organizations (NGOs) have been too numerous and diffuse to summarize or highlight: conferences, teach-ins, reports, demonstrations, etc. However, the key development among NGOs is not the amount of activity itself, but the fact that the Report in general and the goal of sustainable development in particular are bringing together under a single banner once-disparate organizations. NGOs that have organized responses include those concerned with the environment, development, human rights, consumers' rights, tribal people, hunger, and various of the world's religions.

For example, the British NGOs which joined forces under the auspices of the International Institute for Environment and Development (IIED) to publish 'Britain and the Brundtland Report' included Friends of the Earth, Oxfam, Quaker Peace and Service, Survival International, United Nations Association (UK), World Development Movement, and the World Wide Fund for Nature (UK). The Norwegian NGOs' 'Campaign for Environment and Development' brings together 72 different NGOs. (See Index section on non-governmental organizations.)

MEDIA: Naturally the media's initial response to the Report came upon its publication day and when it was presented to the UN General Assembly. However, events such as the US drought over the summer of 1988 (and its possible connection to global warming due to atmospheric pollution), the news of ozone layer thinning

has recently established a special internal task force to develop a system for ensuring that environmental issues are addressed as part of WFP's project design, appraisal and implementation process.

World Health Organization (WHO)

Has initiated a dialogue with all operational divisions at headquarters and the six Regional Offices of the Organization to determine the practical steps for an efficient implementation of the recommendations of the Report. In an address before the 39th session of the WHO Regional Committee for the Western Pacific, newly appointed WHO Director General Hiroshi Nakajima stated that health and sustainable development "is a theme I intend to develop throughout all of WHO's programmes." In a further address to the Programme Committee of WHO's Executive Board in October, he stated that he was convinced that environmental health issues would become the global concern of the 1990s and that, having examined the implications of the Report, he was pleased to note that many of WHO's programmes already address the issues raised in it and will contribute to the implementation of its recommendations.

The Director General has expressed his willingness to collaborate with the Centre on the Global Broadcast (see under Media) and to provide visual and written materials.

World Meteorological Organization (WMO)

As requested by the 40th session of the WMO Council in June of this year, the secretariat has prepared an initial response to the 1987 UN resolutions on sustainable development. The report's conclusions state that WMO will continue to work through its members to provide authoritative scientific measurements, assessments and predictions of the state of the global atmosphere and of earth's fresh water resources. At the same time, it will promote increasingly effective applications of meteorological and hydrological information in seeking sustainable economic development. WMO joins in calling attention to the need for global action to reduce pollution of the atmosphere, based on the scientific information now available.

The Secretary General has expressed his willingness to collaborate with the Centre on the Global Broadcast (see under Media) and to provide visual and written materials.

GOVERNMENT

Bangladesh

Supported the call at the General Assembly for the holding of an environmental summit, under UN auspices and possibly as a special session of the GA.

Brazil

Speaking at the UN General Assembly debate on the convening of a UN environment and development conference, Brazil, as one of the cosponsors of the resolution, fully endorsed the holding of such a conference and announced the offer of the Brazilian Government to host it in Brazil.

The government has set in motion a national programme called "Our Nature", which aims at the coordination and integration of an environmental dimension into the policies and actions of several governmental agencies, and also, through fiscal and other measures, at encouraging

individual and private enterprises to include environmental concerns in their economic undertakings.

Bulgaria

Speaking at the UN General Assembly, the Bulgarian representative said that the government proposes to hold an ecological forum in Sofia within the framework of the Conference on Security and Cooperation in Europe. It also proposed the conclusion of a treaty for an ecological forum in the Balkans.

Canada

Speaking at the opening of the UN General Assembly debate in September, the Canadian Prime Minister said that Canada fully supports the holding of an environmental summit at the heads of government level and also the call for a UN conference on environment and sustainable development in 1992.

The National Task Force on Environment and Economy has prepared a report reviewing progress made in the last year in implementing the recommendations contained in its September 1987 report. The progress report identifies achievements by both the public and private sectors, as well as obstacles to be overcome in the effort to make a fundamental change in the way Canadian society sets its economic goals and makes decisions on the use and management of its resources.

Keeping in line with the Canadian response to the National Task Force on Environment and Economy, Quebec, Ontario, Manitoba, New Brunswick, and Nova Scotia have announced roundtables on environment and economy. The new chairperson of the National Roundtable is David Johnson, President of McGill University. The first meeting is scheduled for February 1989.

The Government is establishing a Centre for the International Promotion of Sustainable Development, which will recommend policies, management practices and decision-making processes government, industry, public and private institutions and NGOs, and will have an important role to play in raising public awareness. It will be the focal point for a multi-disciplinary network of institutions in Canada and other countries with expertise and skills relevant to sustainable development, and will work closely with UN and non-governmental organizations. The new Centre will be located in Winnipeg, Manitoba.

Environment Canada recently announced the "Environmentally Friendly Products" Programme in order to identify environmentally sound consumer goods. An advisory panel will determine product categories and "environmentally friendly" criteria for each category and will then receive applications from industry for use of the "environmentally friendly" label on specific products.

The Ministry of Environment of British Columbia has developed a "Resources and Wastes" environmental education guide to help ensure that secondary students have a better understanding of the issues, problems and solutions associated with waste management. Contact: Information Services Branch, Ministry of Environment, 810 Blanshard St., Victoria, B.C. V8V 1X5; the cost is Can.$10 per complete package.

The government of Ontario Province has established a Roundtable on Environment and Economy. A panel of senior decision-makers from government, business, agricultural and environmental organizations, labour and academics will have a threefold mandate: to support joint sustainable development demonstration projects among government, industry, labour, agricultural and environmental and other interests; to commission research on measures to further sustainable economic development and to disseminate this information; and to develop a provincial sustainable economic development strategy.

The government of the Yukon has published its Yukon Economic Strategy, "Yukon 2000". For information, contact Yukon Renewable Resources, Box 2703, Whitehorse, Yukon Y1A 2C6, Canada; tel. (403) 667-5811; telex 036-8-260.

Denmark

Further to the parliament's 1987 decision, partly inspired by the Report, that an action plan should be elaborated to strengthen environmental considerations in the Danish development assistance programme, its development agency, DANIDA, is now undertaking a series of national studies in key countries where it has major programmes. A report on Kenya has recently been published.

Federal Republic of Germany

The Senate of Berlin (West), in cooperation with OECD and the CEC, is organizing an international conference on "Urban Environmental Improvement and Economic Development" to take place on 24-26 January 1989. The conference forms an integral part of a project currently being undertaken by the OECD Group on Urban Affairs on policies to improve the urban environment. The Centre is providing background materials on the Report for the use of delegates and a former WCED Commissioner will deliver an address.

France

On the occasion of the launching of the French edition of the Report in Paris in September, the environment ministers of France and Quebec suggested the holding of an environment conference for francophone countries, possibly in 1991 prior to the 1992 world conference. It was hoped that the suggestion would be taken up and discussed at the May 1989 Dakar meeting of heads of state and government of the francophone countries, at which environment problems would be on the agenda. The Centre is working with the French Government to prepare and deliver briefing packs on the Report to all participants at the summit.

Hungary

With a view to making the Report better known in the country, a "popularization" scheme was drawn up in April by the Ministry of Environment and Water Resources and the Academy of Sciences. A Hungarian National Environmental Programme is being planned, with input from the Academy and other societies, the Hungarian Council of Women and the Communist Youth Organization. A final draft of the report is to be presented to the Environmental College for their recommendations and a proposal for an action plan will be submitted to the government at the beginning of 1989.

Italy

With prize funds made available by the World Commission, the Italian Ministry of the Environment produced and distributed 200 copies of an Italian version of the Commission's video to schools in Rome to use for environmental education.

Mauritius

The government, in collaboration with the World Bank, held a "Technical Seminar - Mauritius Environmental Protection Programme" at Moka from 12-15 September. The objective was to allow an international forum of government officials, the private sector, NGOs and international funding

agencies to examine environmental issues resulting from a rapid rate of industrialization with a view to achieving a sound environment in a sound economy.

Mexico

The Ministry of the Environment, in collaboration with the Friedrich Ebert Foundation and the Centre, organized a two-day public presentation and debate on the Report in Mexico City on 22-23 September 1988. The first day was devoted to an open discussion between former Commissioners, Latin American experts, officials, ecology groups and academics. Speeches were delivered by President Miguel de la Madrid and Prime Minister Brundtland, among others, and a showing of the video was arranged. The second day was devoted to panel discussions on issues raised in the Report, concluding with an open public hearing chaired by Prime Minister Brundtland. For copies of the proceedings, contact: Director, International Office, Secretaria de Desarrollo Urbano y Ecologia (SEDUE), Av. Constituyentes No. 947, Col. Belan de las Flores, CP 01110, Mexico D.F., Mexico.

Nigeria

An International Workshop on the Goals and Guidelines of the National Environmental Policy for Nigeria was held in Lagos from 12-16 September. The Workshop, organized by the Federal Ministry of Works and Housing and UNEP, brought together top experts and scientists from government, universities, NGOs and several from other countries and international organizations.

With regard to the problem of toxic waste disposal, Nigeria has established a "dump watch" in which it collaborates with other countries in disseminating information on the extent and locations of toxic waste vessels on the high seas. It has cooperated with, and received strong support from, NGOs in this activity.

Nordics

The governments of the Nordic countries (Denmark, Finland, Norway and Sweden) have jointly initiated a three-year research project on the role of the UN system in international development cooperation. The Nordic project will, inter alia, be pursuing studies on the UN system follow-up to the Report's recommendations within the field of energy and development cooperation. A study of how the various UN agencies deal with energy-related issues is to be completed by February 1989. Contact: Nordic UN Project, Hagegatan 23 A, 3 tr., S-11347, Stockholm, Sweden; tel. (46) 8-30 35 41; fax. 08-33 20 46; telex 14010 Framtid S.

Norway

Speaking at the UN General Assembly debate, supported the convening of a UN conference on environment and development.

A Cabinet Committee is supervising the process of evaluating the recommendations of the Report with a view to integration into the policy of every sector and level of government. All ministries have examined the Report and identified the recommendations most relevant to their work. They are to evaluate present programmes and budgets to see if they are consistent with the recommendations and, if not, suggest changes where necessary. The government is to present a report to Parliament and policy adjustments or other changes may be implemented.

Preparations and planning for the 1990 "Action for a Common Future" conference in Bergen, 8-16 May 1990, are proceeding under the auspices of the Norwegian Government and ECE. For further

information, contact: 1990 Conference Secretariat, Ministry of Environment, P.O. Box 8013 Dep. 0030 Oslo 1, Norway; tel. 47-2-34 89 98; fax. 47-2-34 95 61; telex 21480 env n.

Correction: Please note that the correct telephone number of Ms. Liv Westby, Ministry of the Environment, is (02) 34 87 19. not 11 77 96 as stated in Bulletin No.1 (p.10).

Sweden

The Swedish Environmental Institute Committee, set up to consider and propose the orientation and scope of work for an international institute on environmentally sound technology for sustainable development, has now submitted its report. An English version, "SIKSTA - An International Institute for the Assessment of Environmentally Sound Technologies", has just been published. Preparations to set up the new institute are now under way. Parliament has decided on a core budget appropriation for the first five years and the government has enacted the statutes for a foundation that will provide the legal framework for the institute. Broad international cooperation with science, industry, national and international organizations and authorities and with NGOs is considered imperative for the success of the institute's work. For further information, contact: Ulf Svensson, Secretary to the EIC, Ministry for Foreign Affairs, P.O. Box 16121, S-103 23 Stockholm, Sweden; tel. (46) 8 786 6000; fax (46) 8 723 11 76(G3); telex (54) 10590 MINFOR S.

USSR

The Minister for Foreign Affairs of the USSR, addressing the UN General Assembly in September, devoted a significant part of his speech to global environmental problems and their linkage to world security, listing the Report as one of the assets in the struggle against environmental degradation. He called for a three-event series of emergency meetings to be held under UN auspices: a consultative meeting of experts in 1989 to discuss the health of the Earth; a summit meeting for 1990; and the convening of a second UN international conference on the environment for 1992.

A new USSR State Committee for Environment Protection has been established and is interested in developing international connections and in working with the Centre in arranging for a series of public discussions on the Report in the Soviet Union.

United Kingdom

Speaking at the UN General Assembly, and noting that the health of the planet is now a crucial issue for all states, the UK Foreign Minister expressed the determination of his government to carry forward the work of the Commission as expressed in the Report and welcomed the forthcoming debate in the Second Committee on this subject.

United States

A congressional review of US foreign assistance is currently being carried out by the House Foreign Affairs Committee with a view to rewriting the Foreign Assistance Act of 1961. The need to emphasize sustainable development in all foreign aid programmes is being stressed.

The Executive Office of Environmental Affairs in the state government of Massachusetts is exploring a concept of "quality development" for the state. The New England Governors' and Eastern Canadian Premiers' Environment Committee, along with Quebec, adopted a resolution on sustainable

development last June and is interested in working with the Centre in promoting the recommendations of the Report. The Centre has provided background materials and other information.

INTERGOVERNMENTAL

Commonwealth Secretariat

In the context of its programme on Climatic Change and Sea-Level Rise, the Commonwealth Heads of Government, at their Vancouver meeting last year, established an expert group to study man-made climatic change and sea-level rise. The group is now preparing a report for the Kuala Lumpur Commonwealth Heads of Government meeting which will summarize the scientific evidence, elaborate the possible implications especially in relation to low-lying areas, suggest protective measures and look at the scope for preventive measures. A series of consultancy studies will make an important input to the work of the group and the final report.

Council of Europe

In connection with its European public campaign on North-South interdependence and solidarity, the secretariat has prepared a kit - North-South One Future - on the campaign, and also publishes a monthly information bulletin (Meridien) in English and French. A list of national contact points is also available. Contact: North-South Campaign, Directorate of Political Affairs, Council of Europe. BP 431 R6, F-67006 Strasbourg Cedex; tel. 88 614961.

Council for Mutual Economic Assistance (CMEA)

Set up in 1987 a special body entitled the CMEA Standing Commission on Cooperation in the Field of Environmental Protection on which are represented the environmental ministers of the member states. Measures are now being worked out to update the strategy of the CMEA member countries in the field of environmental protection up to 2010, a strategy which comprises all the major problems highlighted in the Report. Actions in this field are conducted on a planned basis in accordance with the "Overall expanded programme for 1986-1990 in the field of environmental protection and related rational use of natural resources".

Inter-Parliamentary Union

At its September 1988 session in Sofia, the Inter-Parliamentary Council unanimously adopted a resolution regarding the results of the Inter-Parliamentary Conference on "Health - a Basis for Development in Africa" held in Brazzaville last June and endorsed, inter alia, the appeal concerning the dumping of industrial, radioactive and toxic wastes in Africa which had been adopted at Brazzaville. The IPU Executive Committee has recommended the setting up of an Ad Hoc Committee on Environment and the Council is expected to take a decision on this at the time of the 81st IPU Conference to be held in Budapest in March 1989.

Organization of American States (OAS)

Has available several publications relating to environmental management produced as part of the technical cooperation programme of the General Secretariat. Contact: OAS, 17th St. and Constitution Avenue, N.W., Washington, D.C.20006, USA.

The Panel notes that the Report has created a momentum to influence policies of lending agencies and development banks so as to ensure that future agreements for water resource development will include environmental management measures as a health safeguard. Information collected by the Panel over the years shows the economic viability of such an approach. The PEEM Newsletter, No.21, August 1988, contains a summary of the Commission's conclusions and an assessment of their importance for PEEM. For further information, contact: PEEM, c/o World Health Organization, 1211 Geneva 27, Switzerland, tel. 91 21 11; telex 27821 OMS.

GOVERNMENTS

Canada

In appointing his post-election Cabinet in January, Prime Minister Mulroney named Lucien Bouchard, one of the most senior and influential members of the Conservative Party, to the post of Environment Minister. As a demonstration of the Government's commitment to strong leadership on environmental issues, he will represent the Environment portfolio in the Priorities and Planning Committee, which is chaired by the Prime Minister and is responsible for determining the Government's overall agenda and major policies. He has also become a member of the Operations Committee, chaired by the Deputy Prime Minister, which reviews the Government's weekly agenda to ensure proper coordination in responding to issues and developing new policies. The Environment Minister also chairs the newly formed Environment Committee which is mandated to manage the Government's environmental agenda and ensure that government policies, programmes and other initiatives which it may be asked to support are fully compatible with the Government's environmental objectives from the perspective of sustainable development.

The Conservation Council of Ontario province has received a C$25,000 grant from Ontario Hydro to produce a report on an Energy Conservation Strategy for Ontario. The report will concentrate exclusively on ways of reducing the overall demand for energy through conservation measures, and will, specifically, summarize the existing provincial strategy; review alternatives for improving the strategy, including their feasibility and the degree of public commitment; and provide clear recommendations to the Province on an improved strategy for energy conservation. It is expected that the project will provide a useful demonstration of how an individual plan for a specific area of concern may be integrated into the wider provincial strategy. Contact: Conservation Council of Ontario, 202-74 Victoria St., Toronto, Ont. M5C 2A5, Canada; tel. (416) 362-2218.

Also in Ontario, the Ministry of the Environment has established an Environmental Youth Corps. In 1988, the Corps provided summer work experience for some 1,000 young people who were hired by NGOs to work on environmental and conservation projects ranging from improving hiking trails and preserving shorelines to helping the public understand the importance of recycling. The programme will be evaluated after a year of operation to determine whether it should be expanded. Further information from: Bill Wolfson, Ministry of Skills Development, Toronto, tel. (416) 965-0482; or Susan Marcus, Ministry of Environment, Toronto, tel. (416) 965-8282.

Denmark

The Danish Government has during 1988 evaluated policy and activities within many sectors of Danish society to estimate to what extent the principles of sustainable development are already being fulfilled and, as a result, has suggested both national and international initiatives for relevant ministries. One of the main aims of the Plan of Action is that the concept of sustainable development should infiltrate the whole of the political and administrative structure and eventually society as a whole.

Among the initiatives to be undertaken are: formation of a committee to follow-up and concretize the plan of action; periodic publication of environmental status reports; analysis of behaviour patterns and their regulation; international research on environmental problems, climate and protection of nature and natural resources, including the atmosphere, ozone layer and oceans; integration of environmental and sustainability concepts in education; initiation of an information and activities campaign; and initiation of a project for a "Green Local Councils" campaign. Action will also be taken within the individual sectors of energy and transport; industry; fisheries; and agriculture.

The Danish Plan of Action, which was first published in December 1988, is in the process of translation and will be expanded upon in the next issue of the Bulletin.

Finland

The Government has agreed to host in Helsinki the first two international meetings convened by UNEP to discuss future cooperation within the framework of the Vienna Convention and the Montreal Protocol on the ozone layer. The First Meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer will take place from 26-28 April 1989; the First Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer will take place from 2-5 May. The parties to both instruments will adopt rules of procedure for their subsequent meetings and for those of any subsidiary bodies, as well as financial rules providing the framework for future work in this field. Representatives of the relevant international organizations are being invited to attend.

German Democratic Republic

A session of the Advisory Council for Environmental Protection to the GDR Council of Ministers took place in Berlin on 21-22 March with the theme "Peace, Development and Environment - the Environmental Policy of the German Democratic Republic". The former Vice-Chairman of the Commission has been invited to take part.

Guinea-Conakry

With financial assistance from USAID and technical support from UNEP, the Ministry of Natural Resources organized a Seminar on the Environment from 23-27 January in Conakry. The main purpose of the seminar was to bring together representatives of a cross-section of Guinean society for discussions on major environmental issues and to consider strategies for dealing with them, including the recommendations of the Report. The Centre provided background materials on the work of the Commission and the Report.

Ireland

At the time of publication, Ireland welcomed the depth of analysis and comprehensiveness of the Report and expressed support for the concept of sustainable development. Since concerted international action is considered to be the key to successful implementation, Ireland's full participation in the development and implementation of the European Community's common environmental policy is an important means for achieving this objective.

The Irish Government is taking positive steps to stimulate interest and debate on the Report's content and conclusions. It published an article in "The Environmental Bulletin", which is a quarterly review of developments in the environmental area in Ireland and which receives wide circulation. A consultation process has begun among government departments in an effort to develop an overall policy position in regard to the recommendations of the Report.

Ivory Coast

Has adopted a law on the protection of public health and the environment against industrial, toxic and radioactive wastes and harmful substances following the adoption of an appeal on the subject by the Inter-Parliamentary Conference on "Health - a Basis for Development in Africa", Brazzaville, June-July 1988.

Netherlands

A statement on follow-up implementation of the Report in the Netherlands was presented to the OECD intra-organization seminar held in Paris on 17 November 1988. The preparation of the first national environmental policy plan is now well underway as a joint undertaking of the Ministries of Housing, Physical Planning and Environment, Economic Affairs, Agriculture and Fisheries and Transport and Water Management. Various economic sectors, including consumers, are being consulted regularly during the process. The national environmental policy plan is expected to be sent to Parliament this month (March).

Four advisory bodies have been assisting the government in drawing up its position - the National Council for Environmental Protection, the Council for Nature Conservation, the Energy Council and the Social Economic Council. The latter was asked to report on what sustainable development, as defined by the Commission, will mean for production and consumption in the Netherlands.

An international meeting was held in The Hague to discuss another of the Report's recommendations - the creation of independent commissions to help developing countries in the evaluation of environmental impact assessments. A small working group was established with representatives of developing and industrialized countries and decided to carry out a few pilot projects to test various options. A report is expected during the course of this year.

In the area of cooperation with NGOs, the government is to give financial support to establishing a focal point that will promote and coordinate activities aimed at the implementation of sustainable development. It is expected that this will become the local counterpart of the Centre for Our Common Future, which will also receive some financial support.

New Zealand

The Secretary of the Environment convened a meeting in the fall of 1988 for officials from departments with policy responsibilities relevant to issues raised in the Report. The result was the preparation of an interim response to the Report for presentation at the 43rd session of the UN General Assembly. It was also presented by the New Zealand delegation to the OECD seminar held in Paris on 17 November 1988. Sustainability is also a central consideration in New Zealand's Resource Management Law Reform currently being undertaken by a ministerial committee; new legislation is scheduled for end-1989. The Ministry is also coordinating work on a New Zealand Environmental Policy which will be closely related to follow-up activities on the Report.

Norway

The Secretariat for the 1990 Bergen ECE Regional Conference has now issued an outline strategy for the conference, which is being organized in response to the 1987 UN General Assembly resolution on the Report.

Four main topics dealt with in the Report and which are of particular relevance to the ECE region have been identified for discussion at the Conference. They are (not listed in order of priority): (1) Cross-sectoral topics - (a) The Economics of Sustainability: Integration of Environmental Objectives in Social and Economic Planning and Policies; (b) Awareness-Raising and Public Participation. (2) Key policy areas - (a) Energy; (b) Industry. Other important international issues which may arise between now and May 1990 may be added to the agenda if the International Preparatory Committee so decides. Although primarily an East-West forum, the Conference should make a special effort to identify, within each of the above areas, concrete measures that ECE countries can take to improve the prospects for sustainable development in the developing countries.

The Conference will be organized in two parts. The first week will consist of working sessions on all four main topics, the purpose being to finalize work on an Agenda for Action. The Ministerial Session at the beginning of the second week will be the highlight of the Conference and will conclude with the adoption of a Government Declaration. This Declaration and the Agenda for Action represent the two final documents to come out of the Conference.

Participation will be open to all representatives from ECE countries. ECE governments are invited to be represented at the Ministerial level during the second week. It is expected that national delegations will reflect the cross-sectoral nature of the agenda and will include representatives from industry, youth and other NGOs. Relevant intergovernmental and UN organizations, as well as industry, the scientific community and NGOs will be invited to send representatives. International NGOs are expected to select a "focal point" for coordination of their preparations and participation in the Conference. An initial grant from the Norwegian Government is aiding this process.

Other preparations include the organization of expert meetings on the four main topics during fall 1989, to be hosted by four ECE governments (US, UK, FRG, Poland), and national reports to be produced by ECE governments, based on a guideline worked out in cooperation with the ECE Secretariat. An International Preparatory Committee (PREPCOM), open to all ECE countries and comprised of representatives from the different participant groups, will be established. The main task of the PREPCOM will be to draw up the Declaration to be adopted by the ministerial session and, on the basis of reports from the

expert meetings, to prepare the text of the Agenda for Action. PREPCOM meetings are tentatively scheduled for August/September 1989; early 1990 and May 1990.

In a further initiative connected with the Bergen meeting, it is planned to organize an international research conference on global environmental change to take place at the same time as the main Conference. Sponsors are the Norwegian Research Council for Science and the Humanities (NAVF), which has been mandated by the Norwegian Government to initiate a scientific follow-up of the Report. For further information on all these events, contact: 1990 Conference Secretariat, Ministry of Environment, P.O. Box 8013 Dep., 0030 Oslo 1, Norway; tel. (+472) 34 59 98; fax (+472) 34 95 61; telex 21480 ENVN.

Singapore

The Government is joining international efforts to protect the ozone layer by acceding to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer. It is now examining measures to comply with the provisions of the two instruments and is encouraging businesses to explore alternatives and to economize on the usage of controlled substances.

Sweden

The Government continues to give major importance to follow-up of the UNEP Environmental Perspective to the Year 2000 and to the Report. In February 1988, a bill was submitted to parliament on the country's environmental policies in the 1990s. Based mostly on the concepts of the Report, it consists, in the main, of long-term action plans to deal with the major environmental problem areas. It also outlines procedures for further national Swedish follow-up to the Report. Within the framework of the Environmental Advisory Council, composed of six cabinet ministers and high-level representatives of various authorities and NGOs as well as the scientific community, a systematic review will be undertaken of the Report's recommendations and how they can be incorporated into Swedish policies. All ministries concerned are preparing a report for consideration by the Council before the summer.

The promotion of a sustainable use of natural resources and protection of the environment was also adopted by parliament as a fifth goal for Swedish development cooperation. Swedish capacity will be increased for assistance within the fields of environment and natural resources as an integrated part of development cooperation. Increased contributions to the efforts to promote sustainable development within multilateral development assistance and financial institutions are also foreseen.

The Swedish Council for Planning and Coordination of Research is funding a programme to promote research into various aspects of the Report. A seminar has been held and a publication issued (Perspectives on Sustainable Development - Some Critical Issues related to the Brundtland Report). In addition, the Royal Academy of Science has conducted a research project on one specific aspect of the Report - the relationship between environmental stress and security.

Sweden also continues to support the efforts of the UN system and the multilateral development assistance and financial institutions in promoting sustainable development. It was a co-sponsor of the resolution on the convening of a UN Conference on Environment and Development at last year's

General Assembly and is prepared to support regional follow-up conferences. In this context, it has allocated some funds for the African Regional Conference to be held in Kampala in June.

Switzerland

On the eve of the international conference on CFCs in London at the beginning of March, the government announced that it would soon be introducing legislation to ban CFCs in aerosols as of end-1990, with the exception of certain medical applications. It is aiming at a complete elimination of CFCs in all utilizations by 1995.

Thailand

Following on last November's devastating floods and mud avalanches in southern Thailand, blamed on uncontrolled deforestation, the government banned timber cutting in all 12 southern provinces of the country and, on 10 January, issued a decree abrogating all logging concessions.

United Kingdom

The Department of the Environment, with the participation of UNEP, organized an International Ministerial Conference on 'Saving the Ozone Layer' from 5-7 March in London. The objectives of the conference were to extend understanding of ozone depletion; to increase international awareness of the work being done by industry to find replacement chemicals or alternative technologies; and to encourage international participation in the process of tackling the problem as set out under the Montreal Protocol. Attendance included ministers and senior officials from 150 countries as well as leading international scientists and industrialists. Britain has pledged to eliminate all CFCs from aerosol cans by the end of this year. In addition, said Prime Minister Thatcher in a recent interview, by 1990 every new car in Britain must be capable of running on lead-free petrol in order to cut pollution.

United States

Replying in December to a letter addressed to him by a group of concerned environmentalists, in which they sought his response to various issues raised in the Report, President (then President-elect) George Bush stressed that he intended to integrate environmental considerations into all policy decisions, and that he planned to convene an international conference on the environment at the White House. The Report would remain "a valuable source of insight and direction" in the work of his administration. Since then, in presenting his budget to Congress in February, the President called for a "new attitude about the environment". Environmentalists have applauded him for proposing a budget that includes funds for new parks, a postponement of offshore oil leases and a commitment to pollution controls, including the introduction of clean-air legislation in Congress which would also set goals and timetables for the reduction of acid-rain pollution leading to negotiations on an accord with the Canadian government.

The Organization will convene the Second World Climate Conference in Geneva from 12-23 November 1990 in cooperation with UNEP, UNESCO and the International Council of Scientific Unions (ICSU). Scientific experts and ministers will review the first assessment reports of the IPCC and also review progress in the scientific and systematic observation programme under the World Climate Programme.

Other major activities include convening, with the Government of Finland, a Conference on Climate and Water in Helsinki, 11-15 September 1989; providing leadership to scientific assessments of the adequacy of the Montreal Protocol on the Ozone Layer, and participating in scientific meetings and activities related to the Vienna Convention. WMO prepared a document for the recent Helsinki meetings on the Protocol and the Convention in which it reconfirmed that after many years of systematic monitoring and research, there was now clear evidence that mankind had affected the global ozone layer. The document presented a status report on atmospheric ozone observation and research.

To celebrate the 25th anniversary, 1963-88, of the World Weather Watch (WWW), WMO has produced a booklet describing WWW, its history and current and future activities. For copies, contact: Public Information Office, WMO, P.O. Box 2300, 1211 Geneva 2, Switzerland; tel. (22) 730-8111; tlx. 23260 OMM CH; fax (22) 734-2326.

GOVERNMENTS

Brazil

In response to increasing concern about development policies in the Amazon region, President Sarney announced on 6 April the establishment of a $100 million, five-year programme to zone the 1.9-million-square-mile forest basin for economic and ecological use. It will be financed in part by FAO and will permit the rational siting of economic activities and environmental monitoring of those activities, according to the President. At the same time, he rejected all calls for the "internationalization" of the region and ruled out the possibility of any debt-for-nature swaps. He also signed 49 environmental decrees, some of which were for the creation of new parks and others for the provision of investments totalling $76 million in new environmental programmes.

Canada

The Prime Minister announced the members of the National Round Table on Environment and Economy (NRTEE) on 28 March 1989 and personally attended the group's first meeting in Ottawa on 27-28 April. The NRTEE is composed of 24 members who were selected by region and on the basis of their expertise in particular fields, and they include, among others, Chairman David Johnston, Principal of McGill University, and Jim MacNeill, former Secretary General of the World Commission on Environment and Development.

The federal Environment Minister announced on 20 February 1989 that the federal government has plans for the complete elimination of controlled CFCs within the next 10 years. He also called on the rest of the world community to reduce CFCs by at least 85% by 1999 at the latest. These guidelines are stricter than those of the 1987 Montreal Protocol which calls for the halving of CFC use by 1999. The government will now begin consultations with industry and interest groups on the new reduction target. Controls will call for the recovery or recycling of CFCs and halons and an outright prohibition on new

applications, unless they are proven essential. Studies are already under way to assess the social, economic and other impacts of all available control options.

The Environment Department has established an Environmental Partners Fund to encourage all Canadians to play their part in protecting and preserving the environment. During 1989, the Fund will make C$50 million available over a five-year period for projects of two types: clean-ups that restore and conserve (e.g. tree-planting, local parks and wetlands, community-based water conservation and habitat restoration); and waste recycling and waste reduction initiatives. For further details, contact: Gerry Fitzsimmons, External Relations, Environment Canada, Ottawa, ON K1A 0H3, Canada; tel. (819) 994-1628.

The Canadian International Development Agency (CIDA) has issued a policy statement on CIDA's strategies for aid and development. Entitled "Environment and Development", the policy requires CIDA's comprehensive Environment and Development Implementation Strategy to focus on preventing further environmental destruction and on promoting development that will enhance the environment in the long run. The strategy contains five basic elements: the establishment of a mandatory procedure for assessing the environmental impacts of CIDA projects; a focus on environment-enhancing programmes and projects, including funding of more projects that benefit the environment directly; the promotion of environmental awareness at the local level; institution-building and support; and data collection, with Canada continuing its role as a world leader in natural resource management research. For more information, contact: Gilles Lamoureux, Special Advisor, Environment, CIDA, 200 Promenade du Portage, 7th floor, Hull, PQ K1A 0G4, Canada; tel. (819) 953-3411.

In response to the Commission's Report and to the recommendation of Canada's National Task Force on Environment and Economy that each province and territory develop an action plan for sustainable development, the Yukon Department of Renewable Resources is inviting all Yukoners to participate in the development of a proposed conservation strategy for the territory. The strategy is scheduled to be completed and submitted for cabinet approval by the government of the territory during this year. For information, contact: Stephan Fuller, Manager, Policy Analysis and Development, Department of Renewable Resources, Government of Yukon, Box 2703, Whitehorse, YT Y1A 2C6; tel. (403) 667-5634.

Czechoslovakia

Communist Party General Secretary Milos Jakes, in an interview with the newspaper "Rude Pravo", said that Czechoslovakia is drawing up a set of proposals and measures with a view to a meeting on the environment with the premiers of neighbouring countries. Noting that knowledge of data on the state of the environment is necessary for all countries, he said that Czechoslovakia is considering recommending the creation of a unified system for monitoring the ecological situation and an ecological databank. It would also be expedient to form a joint consultative body which would unite technological policies and help set up joint scientific-production enterprises. Czechoslovakia would be pleased to host such a body in Prague.

Israel

The Israeli cabinet decided, on 25 December 1988, to establish a Ministry of the Environment, thus placing environmental concerns high on the political agenda. The nucleus of the new ministry is composed of former members of the Environmental Protection Service and it is headed by Environment Minister Roni

Milo. In his inaugural address, the new Minister said that the establishment of a Ministry of the Environment "would plant a seed of hope for a positive change in all that touches a better quality of the environment, a better quality of life in this country". The Israel Environment Bulletin is now published under the auspices of the Ministry and is available from the following address: Israel Environment Bulletin, Ministry of the Environment, POB 6158, Jerusalem 91061, Israel; tlx. 25629 ENVIR IL; fax 2-385638.

Japan

The Japanese Government, together with UNEP, is sponsoring a conference on "the Global Environment and Human Response" to take place in Tokyo from 11-13 September 1989. The objectives of the conference will be to contribute to current international efforts to expand the knowledge base relating to global environment issues and to identify priority areas for international cooperation and agree on an agenda for action. As this is the first major conference of its kind in Asia, it will also have the aim of enhancing environmental awareness in nations of the region. The two main themes will be global atmospheric change and development and the environment. Participants will include scientists, academics and others with expertise in fields relevant to global environment issues and environmental deterioration in developing countries.

Korean DPR

The Government of the Democratic People's Republic of Korea is playing host to the 13th World Festival of Youth and Students taking place from 1-8 July in Pyongyang with some 15,000 participants from around the world. The Government also hosted the 4th meeting of the International Preparatory Committee for the Festival which was held from 30 March-3 April 1989. The DPRK President delivered the opening speech, which underlined, inter alia, the role young people can play in cooperating to bring about world peace and security (see also under "Youth - IUS").

New Zealand

The Department of Scientific and Industrial Research, the Government's scientific organization, has prepared a submission on the scientific aspects of the Report for the Ministry for Environment. Comments were sought from the Antartica, Botany, Biotechnology, Chemistry, Ecology, Geological Survey, Grasslands, Nuclear Sciences, Soil Bureau and Water Science Divisions. All supported the Report's call for urgent remedial action, saying that the severity of global ecological problems cannot be overstressed. A number of respondents noted the implications of the Report's recommendations for the current debate on New Zealand's Resource Management Law Reform (RMLR), since many of the issues addressed by the Report are central to that debate.

The submission summarizes the comments of the various Divisions under the headings of Energy, Research, Sustainable Development, Species and Ecosystems and International Responsibilities, and concludes with a list of policy implications for government in ratifying the Report. DSIR considers the remedial strategies suggested in the Report should, by and large, achieve their respective aims if implemented, but notes that "most run counter to accepted economic practice, vested interests, cultural and religious beliefs, burgeoning global population and, in some cases, basic human nature".

A seminar on Global Issues and Sustainability was organized by the Ministry for Environment in Wellington on 9 March. Among topics discussed were global environment issues; ozone layer depletion; global climate change: policy and impacts; the Ministry's proposed "Brundtland" programme; indigenous populations and global environment concerns. The Ministry for the Environment publishes a monthly newsletter, "Environment Update", which is available free from: Ministry for the Environment, P.O. Box 10-362, Wellington, New Zealand; tel. (04)734-090; fax (04)710-195.

Netherlands

The Dutch Government's National Environmental Policy Plan (NEP) was made public on 25 May 1989 when it was sent to Parliament. The Plan's basic principle is sustainable development as set out in the Report, and its aim is to solve the country's environment problems within the space of a generation. They must therefore be made manageable within a period of 20 to 25 years. In the Plan, the government sets out how and with what resources it intends to mount this struggle. It also makes clear the contributions to sustainable development which are expected from every group and sector in society, saying that a positive, active attitude is indispensable to the realization of a clean environment. The NEP contains concrete measures for the period 1990-94, and it will be revised every four years after that. It estimates that in 1994 an amount of 6.7 guilders over current expenditures will be spent on environmental protection.

The main measures will be taken in the fields of acidification, energy conservation, climatic changes, transport, agriculture, waste disposal, waste water and environmental technology, the target groups being those connected with these areas. The major elements are summarized in a booklet (in English) entitled "Highlights of the National Environmental Policy Plan - A Clean Environment: Choose it or Lose It". Copies may be obtained from: Ministry of Housing, Physical Planning and Environment, Department for Information and International Relations, P.O. Box 20951, 2500 EZ The Hague, The Netherlands.

Norway

The Norwegian Government's Parliamentary Report (White Paper) on environment and development appeared at the end of April. Among the major initiatives contained therein are: a proposal to allocate 0.1 per cent of GNP (approximately Kr.600 million) to an international climate fund under the auspices of the UN, provided that it receives support from other industrialized countries. The fund would be used, inter alia, to support developing countries in their efforts to adjust to future international environmental regulations; further developing international cooperation on environmental questions, not only through the climate fund, but by working for the establishment of an international court that would settle disputes and questions of compensation in cases of cross-border pollution and contravention of international agreements on the environment; the allocation of funds over the National Budget to support bilateral and regional cooperation with other countries on environmental questions. Norway will also set targets for limitations on carbon dioxide (CO2) emissions so that they are stabilized by the end of the 1990s, and after that it will be possible to reduce them. By defining these targets, Norway aims to lead the way in the effort to achieve an international climate agreement. The paper also sets targets for the reduction of CFC emissions that go further than those set out in the Montreal protocol. The White Paper has been very well received both in Norway and abroad, much attention especially being given to the climate fund suggestion. For further information, contact: Ms Liv Westby, Ministry of the Environment, 0030 Oslo, Norway; tel. (472) 34 57 19.

The Secretariat of the 1990 Bergen "Action for a Common Future" Conference has now issued details of the four Expert Meetings which will take place prior to the regional conference. The Expert Meeting on "Awareness-Raising and Public Participation" will take place in, or near, London during the week starting 25 September 1989; the Meeting on "Sustainable Industrial Activity" is scheduled to take place in Warsaw from 8-10 November 1989; the Meeting on "Economics of Sustainability" will take place in Washington D.C. in January 1990; and that on "Sustainable Energy Use" will take place in the Federal Republic of Germany from 11-14 December 1989. Participants in each meeting will be limited to 50-70 and should at least include representatives of ECE governments, relevant international organizations, the scientific community, environmental NGOs, industry (including labour organizations) and youth. The percentage from each group who should participate has not yet been decided. Further information on the Expert Meetings can be obtained from the Secretariat at the address below.

The Secretariat has also drawn up a list of relevant names and addresses of officials responsible for organization of the various events being planned for Bergen. These include the conference at the ministerial level, the expert meetings, NGOs, and related activities such as the Science Conference and the Youth Action for a Common Future conference.

As preparations for the Conference are many and varied, limitations of space do not allow us to list them all here. An "Update on Bergen 1990" (document 1990 CS/N/6) has been prepared and is available, along with other information, from: Ministry of Environment, 1990 Conference Secretariat, P.O. Box 8013 Dep., 0030 Oslo 1, Norway; tel. (472)34 59 79; fax (472)34 95 64; tlx. 21480 ENV N.

United Kingdom

In his capacity as Chairman of the "Saving the Ozone Layer" Conference that took place in London in March, the UK Secretary of the Environment addressed a message to the first meeting of the Parties to the Montreal Protocol on the Ozone Layer meeting in Helsinki from 2-5 May 1989. The message summarized the main points arising out of the discussions at the London Conference and noted that all countries, whether parties to the Protocol or not, recognized that there was urgent need for global action, that the Protocol was the right framework and that measures stronger than those at present required would be needed. It concluded by citing the Report's call for sensitive economic growth, saying that the threat to the ozone layer is a threat to sustainable development and that the nations of the world cannot fail to meet this common challenge if there is to be a common future.

A speech on the subject "Common Future, Common Challenge - British Aid Policy and the Environment", delivered by the Minister for Overseas Development on 28 February 1989 as part of the St. John's College, Cambridge, lecture series on environment and development (see Bulletin No.2, p.39), has now been published in the form of a booklet. Contact: Natural Resources and Environment Dept., Overseas Development Administration, Eland House, Stag Place, London SW1E 5DH, UK; tel. (01)213-3000.

United States

President Bush has now made public the administration's proposals for a new Clean Air Act to revise the 1970 Act. The plan would tackle three major kinds of air pollution: acid rain, smog and industrial toxics. For acid rain, in line with environmentalists' proposals, the plan would require that coal-burning power plants cut sulphur dioxide emissions in half by the end of

the century; companies would be free to decide how to meet this goal. For smog control, the 81 metropolitan areas which at present exceed federal health standards for ozone would be required to meet these standards by the year 2000; three exceptions, Los Angeles, New York and Houston, would be given until 2010, but would have to show annual progress. Motor vehicle exhaust emissions are especially targeted, with a 40 per cent cutback in hydrocarbons required by 1993 and a 30 per cent reduction in nitrogen dioxides. As for industrial toxics, companies would have to reduce by 75 per cent over the next 10 years the current 2.7 billion pounds of toxic chemicals emitted into the air each year. The proposals will now go to Congress for discussion and eventual legislation.

INTERGOVERNMENTAL ORGANIZATIONS

African Ministerial Conference on Environment (AMCEN), Nairobi

AMCEN held its third session in Nairobi from 10-12 May 1989. Its inaugural meeting took place in Cairo in 1985 when it drew up the Cairo Programme. This has as its ultimate goal to halt and reverse the degradation of the African environment in order to satisfy the food and energy needs of the people of the continent. The programme stresses that African governments bear the primary responsibility for solving their problems and that they should provide a considerable portion of the financial and other responsibilities involved before seeking external assistance. They should use traditional technologies more suitable to the needs, skills and means of the local people instead of introducing expensive equipment and methodologies. In spite of serious financial constraints, the 39 African delegations present reaffirmed their will to strengthen their efforts towards the implementation of the Cairo programme. The Conference invited UNEP's Executive Director to request UNEP's governing council at its 15th session to continue to provide technical and financial support so as to make the programme fully operational as soon as possible. Contact: AMCEN, c/o UNEP, Nairobi (see above for full address).

Inter-Parliamentary Union (IPU), Geneva*

Meeting at the 81st Inter-Parliamentary Conference in Budapest, 10-18 March 1989, the IPU Council endorsed the recommendation of the Executive Committee to create an IPU Ad Hoc Committee on Environment with the aim of studying environmental matters on a continuing basis, considering steps taken by parliaments and governments and encouraging national and international efforts towards sustainable development. It will be composed of nine members, six of whom will be selected on the basis of regional and geographic factors and three chosen among parliamentarians who are experienced in environmental questions and internationally known. It is proposed that the Committee hold its first meeting in Geneva early in 1990. Priority issues for study are: follow-up to the Global Convention on the Control of the Transboundary Movements of Hazardous Wastes; biological diversity (including action to protect biological property of a given country or region); and climatic change.

An Inter-Parliamentary Conference on Tourism, convened jointly by IPU and the UN World Tourism Organization (WTO), took place in The Hague from 10-14 April 1989 and concluded by approving a Hague Declaration on Tourism. Environmental protection was one of the participants' major concerns, and Principle III of the Declaration specifically refers to the concept of sustainable development and the Report. An annex to the Declaration contains the Specific Conclusions and Recommendations adopted by the delegates.

Representative SCHEUER. Thank you very much, Mr. MacNeill. We appreciate this very much. I'm very much interested in this particular aspect of your work whereby you are directing Cabinet officials and Cabinet Ministers to put the ecological and environmental measuring stick to development programs.

There has just been organized an interparliamentary organization called GLOBE, the Global Legislators Organization for a Balanced Environment. We hope that one of the functions of GLOBE will be to exchange information among decisionmakers.

And this is a pilot process. It seems to me that it would be totally appropriate for us to recommend that Cabinet officials and Ministers at departments, all of whom in parliamentary governments are elected members of parliaments, and, therefore, come under scrutiny, it seems to me that is a very obvious and clear area where we could pass on the recommendation that you have just made. That they apply that measuring stick in each country—the ecological and environmental measuring stick to their own development programs.

We'll be chatting with you as to the best way we can do that.

Thank you very much.

We'll now hear from Robert Repetto, who is presently director of the economic research program at the World Resources Institute.

Mr. Repetto has taught at the Harvard School of Public Health. He has been a distinguished associate professor of economics in population there.

He served as a consultant to every conceivable global financing agency—the World Bank, the Regional Development Banks, the OECD, the U.S. AID, the Rockefeller Foundation, and others.

We're delighted to have you here, Mr. Repetto. And we want to thank you for all the quiet help you've given us in organizing GLOBE and in organizing these hearings.

Please take 7 or 8 minutes and chat with us. Then, after we hear from Mr. Arnold, we'll have some questions for all of you.

STATEMENT OF ROBERT REPETTO, DIRECTOR, ECONOMIC RESEARCH PROGRAM, WORLD RESOURCES INSTITUTE

Mr. REPETTO. Thank you very much, Congressman Scheuer.

I think we've just heard such valuable testimony that so ably sets out the parameters of the problem and the implications that I would be perfectly content just to say it again.

And, fortunately, much of what I have to say merely particularizes Jim MacNeill's recommendations for the United States.

First, to address your problem of measuring sticks. One thing we can do that would help enormously to correct this compartmentalization of ecological sustainability and economic growth is to revise the definition of income and other macroeconomic aggregates on which we base all of our planning and policymaking.

The most fundamental definition of income, and you can get it right out of a textbook on economics, embodies the notion of sustainability. It's defined as the maximum amount that can be consumed this year without reducing potential consumption in years to come. That's sustainability.

Living beyond one's means by dipping into capital is ultimately unsustainable and that's why, when we measure economic growth, the first charge against output gross national product is a capital consumption allowance.

It's there because we need to estimate the investment required to keep the capital stock in tact.

What is left over is essentially national income. However, when we apply this concept, we use the most narrow concept of assets, excluding everything but physical plant and equipment. We exclude human resources and this distorts the way we measure and think about economic progress.

Natural resources are not recognized, and this is a fundamental measuring stick, as economic assets. Consequently, a country could cut down its forests, erode its soil, exhaust its fisheries, pollute its atmosphere, deplete its minerals, but measured income——

Representative SCHEUER. Destroy its wildlife and its tourism base.

Mr. REPETTO. Exactly.

And this leads to the false dichotomy between economic growth and economic potential. We have just completed a study using Indonesia, as an example, of how economic growth would look if we measured income in a way that's consistent with the definition of sustainability. And it makes a very large difference.

Our current framework seriously distorts the measures of success—income growth, capital formation, and productivity. These measurements underlie all of the macroeconomic analysis that's carried out by IMF, the World Bank, by the national planning agencies, by the AID. And this is, therefore, carried forward into policy.

I have attached a copy of this study to my prepared statement which shows these differences.

Now, we have an opportunity to change that. The U.N. system is now revising their system of national accounts, which practically all market economies follow. They only do this once every 20 years.

Unfortunately, they've already tentatively decided not to recommend any fundamental revisions of the system.

Representative SCHEUER. When you say the U.N.——

Mr. REPETTO. The U.N. Statistical Commission, Congressman Scheuer, and the U.N. Statistical Office, which have the responsibility.

They propose to relegate all natural resource accounting and all human resource accounting, for that matter, to a set of satellite accounts, printed in the back of the book and isolated from core definitions of income and economic growth.

Now, the United States, acting with other OECD countries, can still influence that decision. That would be an important, very feasible step in the right direction.

And, of course, there's a further step in that direction consistent with what Mr. MacNeill said.

We could adopt the same revised definition for our own national income accounting framework.

Representative SCHEUER. And what agency in our government would make that decision?

Mr. REPETTO. The Department of Commerce, Bureau of Economic Activities. We are represented on the Statistical Commission, by the way. We have a representative from OMB who sits on that.

Representative SCHEUER. On the U.N.'s. It seems to me that's something we ought to press both in the Statistical Commission and our own Commerce Department.

Mr. REPETTO. I agree. I'd like to endorse Mr. MacNeill's point that our southern neighbors are rightfully sensitive to criticism of their economic policies from the United States, especially if we're doing essentially the same thing ourselves.

And if the United States carried out a survey of its own policies looking for opportunities to make economic growth more sustainable, we'd find many opportunities.

Our relatively low energy prices, for example, have brought gains in energy efficiency to a halt, increased pollution, while undermining energy security.

Yet, we haven't been able to adopt a gasoline tax or any broader tax on fossil fuels. Domestic agricultural policies, despite the conservation program—generate crops or pluses while increasing chemical runoff, groundwater depletion, and soil erosion.

Yet, we haven't found a way to decouple farm income supports from pricing.

Our Federal water policy subsidizes low-value agricultural uses, wastes scarce western water in ways that aggravate increasing problems of drainage and soil salination.

Yet, we're losing an opportunity to revise the Bureau of Reclamation and Irrigation contracts.

Our Forest Service is expanding timber sales in national forests and can't cover direct growing and management costs. They justify that policy by claiming recreational and environmental side benefits. But, the alleged beneficiaries come here and testify to Congress to get the Forest Service to stop providing them with those benefits.

They even go to court.

Our cities are choking on solid wastes, yet Federal policy does little to encourage waste reduction recycling. Some of our policies, for example, postal rates that encourage bulk mailings and junk mail, actually enlarge the waste stream.

In each of these instances, it's possible to reduce the Federal deficit to raise overall economic opportunity and prevent damage to the environment and natural resources.

These are steps in the direction of sustainable economic growth.

If we look at our policies toward developing countries broadly, we'll find there's much we can do on that front, too, and some of it is fundamental. Long on sustainable development is inconceivable with population doubling every generation.

Most developing countries have recognized this and have adopted family planning and population programs. Yet, we're trying to impose an agenda on those countries for which we don't have even a majority at home.

We should be vigorously supporting the population programs and policies that developing countries have themselves adopted.

Representative SCHEUER. And, indeed, we're turning our back on the programs in which, traditionally, we have been the world lead-

ers, making knowledge and systems available to women of childbearing years in our own country to help them control their fertility and being a world leader in the same effort abroad, for a generation.

It's only in the last 10 years of the Reagan—I hope it will not be the Reagan-Bush era, but in the Reagan era, it's only since 1981 that we've turned our back, on our traditional role of helping people around the world control their fertility and achieve the timing and number of children that they desire.

To me, it's extremely ironic that in 1974, at the time we set out the U.N. population entity in Helsinki, or where was it? Bucharest, I guess, under a far more enlightened national administration than we've had in the last decade, the United States was urging upon those people that family planning had to be a quintessential element in their overall development programs.

And they were saying:

No, no, no, what we need is development. That's what will curb our population increase.

Then, by the time a decade had past, or a decade and a half, those countries were coming to us and saying:

You were absolutely right. We need family planning. Please help us.

And we were responding to them:

No, no, no, you were absolutely right. Development is the answer to your problem. You don't need family planning assistance.

That has to be one of the great ironies of all time.

Excuse me, Mr. Repetto. Please continue.

Mr. REPETTO. In many developing countries, there's little hope of relieving pressures on the remaining forests and marginal development of soils unless poor peasant households somehow gain access to more suitable agricultural land.

And responsible people in many developing countries recognize this; yet, political parties and governments that have espoused tenure reform are regarded as dangerously radical and probably Marxist, even though smallholder agriculture following tenure reform has been an extremely successful basis for developing in such non-Communist countries as Taiwan and South Korea.

We should be vigorously supporting it elsewhere. We decry the exploitation of natural resources, such as tropical forests; yet, developing countries that try to diversify their economies into labor-intensive manufacturing and agricultural products encounter serious trade barriers.

The economic future of the United States is linked to advanced products and technologies, not to labor-intensive manufacturers.

We should be eliminating those trade barriers, particularly non-tariff barriers, to imports of labor-intensive manufacturers from the Third World. How else are these countries going to absorb productively the increase in their labor force?

The prolonged debt crisis in much of the south has aggregated environmental destruction. Employment in the Southern Hemisphere has stagnated for the past decade; meanwhile, the labor force has grown by 30 percent.

The absorption of rural labor into more urban jobs has slowed down or stopped.

Where are these new workers going?

Some have joined the other economy, the urban informal sector, but real wages there have dropped by 25 or 50 percent.

The urban pool has slackened and the rural labor has piled up in rural areas, feeding a growing stream of rural-to-rural migrants heading toward the forest frontier or the upper watersheds.

Much of the increased burning of the Amazon during this decade can be traced back to the economic crisis. There's a bumper sticker attributed to Harvard President Derrick Bok, which says:

"If you think education is expensive, try ignorance."

We need one that says:

"If you think economic development is environmentally damaging, try economic stagnation."

There is a growing recognition that economic interests and the environmental security of the United States are affected by the destruction of natural resources in the south and that must be reflected in new forms of international cooperation.

A year ago, we at World Resources Institute were asked by U.S. AID, Canadian AID, and the United Nations Development Program to explore ways by which we and other developed countries could promote a revival of more sustainable development in the south through new financial and other forms of support.

Our draft report, what we titled "The International Conservation Financing Project," was recently presented to the sponsors. I've attached an executive summary to the prepared statement.

We found, of course, that there are many, many opportunities. I'd like to highlight just two very briefly. One is a new international environment facility addressing the problem of the need for increased aid, and aid flows.

We propose that bilateral and multilateral development institutions join with NGO's in a cooperative effort to overcome obstacles to increased funding of conservation or projects; that is, development projects aimed at protecting and restoring the use and sustainability of the natural resource base.

These kinds of projects are different compared to traditional infrastructure projects, many of which are environmentally damaging. These require more lengthy preparation, more detailed ecological information, adapted and flexible forms of execution, fuller involvement of local institutions and financing arrangements suitable to longer payout periods and noncommercial kinds of returns.

Some agencies, including AID, are supporting such projects, but the needs are on orders of magnitude greater than what is now being done.

In the international arena, some development agencies have lack of competence and lack of money while some potential funding sources lack experience.

I think much could be gained by pooling resources in a cooperative facility to expand project developments and cofinancing of such projects.

This is an area in which the U.S. Government could play a leading role.

Second, linking debt reduction to sustainable development. We've heard a lot about debt for nature swaps in Latin Amercia, retiring

commercial bank loans, channeling foreign donations to support conservation programs in host countries.

Up until now, the funds available through charitable contributions and NGO's have been limited, but there are opportunities to build on that using the debt reduction activities of the IMF and the NDG's, responding to the Brady plan.

These involve tens of billions of dollars, not tens of millions.

Representative SCHEUER. Does the Brady plan offer any significant hope of linking debt reduction to improved environmental behavior?

Mr. REPETTO. The link has to come through policy reform. The World Bank and the IMF have proposed providing money for debt reduction attached to structural adjustment and sectoral adjustment lending.

Those kind of policy-based loans aim to help developing countries restructure investment priorities and incentives affecting private behavior.

Representative SCHEUER. You say those are policies of the World Bank and the Regional Development Bank?

Mr. REPETTO. That's right.

Representative SCHEUER. Does the Brady plan support, encourage, and enhance that approach?

Mr. REPETTO. Yes, in the sense that the Brady plan has encouraged those institutions to engage in debt reduction, those institutions do it through the vehicle of policy-based lending.

It's an opportunity to move forward on the agenda that Mr. MacNeill has put forward of correcting policies that actively encourage the destruction of natural resources. Just as we have energy policies, forestry policies, and agricultural policies, and water policies that are economically inefficient and environmentally damaging, so do many developing countries.

Those countries, too, can reduce fiscal burdens, increase economic productivity and protect natural resources by improving and installing more appropriate incentives. And this is a powerful mechanism by which to do it.

We need to ensure that the IMF, the World Bank, and the Regional Development Banks take full account of natural resource and environmental implications of this structural and sectoral adjustment lending practices.

I can elaborate on those points in discussion, Congressman Scheuer.

That concludes my testimony.

[The prepared statement of Mr. Repetto, together with attachments, follows:]

PREPARED STATEMENT OF ROBERT REPETTO

I. An Operational Definition of Sustainable Development

The phrase "sustainable development" could easily become another hackneyed slogan, but the fundamental meaning given it by the World Commission on Environment and Development has important implications for economic policy both in developing countries and in our own. Sustainability means that economic activity should meet the needs and aspirations of the present without sacrificing those of the future. It means that the assets needed to generate future wellbeing must not be depleted to satisfy current consumption demands, but should increase. How else can the higher aspirations of a larger future population be met?

In any nation's portfolio of assets, there are not only financial claims and physical plant, but (perhaps more important) human resources and natural endowments. We have seen in the aftermath of war how quickly a disciplined and industrious

population can recover from the loss of its financial and tangible capital. Postwar economic development theorists such as Walt Rostow and Arthur Lewis greatly overemphasized the accumulation of invested capital as a source of growth. We have since recognized the importance of "human capital" -- an educated and healthy population. We can also see clearly that institutions are very important assets (or liabilities), by comparing progress between market and non-market systems, or between cohesive and torn societies.

We have also finally come to realize that natural resource endowments are crucial economic assets for most countries, and can be depleted or degraded by economic activity. Climate change threatens to impose severe economic loss. Pollution imposes economic costs totalling billions of dollars annually. In developing countries, forest destruction, soil degradation, loss of biological diversity, and depletion of other natural resources are reducing future income, employment, and foreign exchange earnings.

The definition of income found in textbooks of accounting and economics conveys this notion of sustainability. Income is defined as the maximum amount that can be consumed this year without reducing potential consumption in years to come. Living beyond one's means by "dipping into capital" is ultimately unsustainable. That's why in measuring economic growth the first

charge against gross national product is a capital consumption allowance, estimated as the investment required to keep the capital stock intact. What's left over is essentially national income.

Unfortunately, in applying this concept, we still use the most narrow concept of assets, excluding all but physical plant and equipment. This distorts the way we measure, and hence, think about economic progress. Physical plant is recognized as productive capital that must be maintained and enhanced if economic growth is to be sustained -- other resources are not. A country could cut down its forests, erode its soils, exhaust its fisheries, pollute its aquifers, and deplete its minerals, but measured income would not be affected as these assets disappeared. This leads to a dangerously false dichotomy between economic growth and environmental protection.

WRI has recently completed a study that shows how different economic performance would look if natural resources were treated as depreciable assets. Our current accounting framework seriously distorts the measurement of income growth, capital formation, and productivity. Since these measurements underlie all the macroeconomic analysis carried out by national governments, international development agencies, and private forecasters, the distortions are carried forward into economic and business policy. I have attached to this testimony a brief summary of that

study, called Wasting Assets: Natural Resources in the National Income Accounts.

The best option available to make the idea of sustainable development operational is to remove this anomaly from the national income accounting framework. It is quite feasible to treat natural resources as depreciable assets, as our case study has demonstrated. If depletion of natural resources can no longer masquarade as income growth, governments tempted to engage in environmental deficit financing will be less able to hide behind a reassuring screen of economic indicators. Policies that promote destructive and wasteful uses of natural resources will no longer be justified so easily as necessary for economic growth.

Fortunately, the United Nations is currently revising its system of national accounts, which most countries with market economies follow. There is an opportunity that comes only once in twenty years to make an important reform at minimal cost. Unfortunately, the UN Statistical Commission has already tentatively decided to recommend no fundamental changes in the current system, and wants to relegate all natural (and human) resource accounting to so-called "satellite accounts", isolated from the widely-used indicators. The U.S., acting with other OECD countries, can still influence this decision. As an important step in that direction, we can also adopt the same change in our own national income accounting system.

II. Toward Sustainable Development

This hearing is focussed on economic development in the Third World. Before looking southwards, however, we should look at our own policies. Our southern neighbors are rightfully sensitive to criticisms of their economic policies from the United States, if we are doing essentially the same thing. One suggestion the Brundtland Commission made is that every country should examine opportunities to make their own economic growth more sustainable. In our case, the opportunities are many:

- Our relatively low energy prices have stimulated demand and brought gains in energy efficiency to a halt, increasing pollution while undermining energy security. Yet, we haven't adopted a gasoline tax or broader tax on fossil fuels.

- Our domestic agricultural policies, despite the conservation reserve program, generate crop surpluses while increasing chemical runoff, groundwater depletion, and soil erosion. Yet, we haven't found a way to decouple farm income maintenance from price supports.

- Our federal water policy subsidizes low-valued agricultural uses of ever-scarcer Western water that aggravate increasing problems of drainage and soil

salinization. Yet, we are losing an opportunity to revise those Bureau of Reclamation irrigation contracts.

o Our Forest Service has expanded timber sales from national forests that cannot cover direct growing and management costs, justifying that policy by claiming recreational and environmental side-benefits that the alleged beneficiaries contest both in Congress and the courts.

o Our cities are choking on solid waste, yet federal action does little to encourage waste reduction or recycling, and such policies as postal rates that encourage bulk mailings even enlarge the waste stream.

In each instance, it is possible to reduce the federal deficit, raise overall economic productivity, and prevent damage to the environment and natural resources. These are steps toward more sustainable economic growth in this country.

There is much the United States can do to encourage more sustainable development in the Third World, if we look broadly at the world economy. Some of it is fundamental. Long-run sustainable development is inconceivable with population doubling every generation. Most developing countries have recognized this and adopted family planning and population programs. Yet, the

United States is trying to impose an agenda on those countries for which there is not even majority support at home. We should be vigorously supporting the population programs and policies developing countries have adopted.

In many developing countries there is little hope of relieving pressures on remaining forests and marginal upland soils unless poor peasant households somehow gain access to more suitable agricultural lands. Yet, political parties or governments that espouse tenurial reform are regarded as dangerously radical and probably Marxist. Smallholder agriculture following tenurial reform has been an extremely successful basis for development in such countries as Taiwan and Korea. We should be vigorously supporting it elsewhere.

We decry the overexploitation of natural resources, such as tropical forests, in developing countries, yet developing countries that try to diversify their economies into labor-intensive manufactures and temperate agricultural products encounter serious trade barriers. The economic future of the United States is linked to advanced products and technologies. We should eliminate trade barriers, especially non-tariff barriers, to imports of labor-intensive manufactures and temperate agricultural commodities from the Third World.

We must recognize the linkages between the world economy and the global environment. In many ways, the prolonged debt crisis in much of the South has aggravated environmental destruction. While income and employment in the Southern Hemisphere have stagnated for the past decade, the labor force has grown by 30 percent. The absorption of rural labor into more productive urban jobs has slowed dramatically. Where have these new workers gone then? Some have joined "the other economy", the urban informal sector, where real wage rates have dropped by 25 to 50 percent. But, since the urban "pull" has slackened, more labor has piled up in rural areas, feeding a growing stream of rural-to-rural migrants toward the forest frontier and to upper watersheds to slash or burn a subsistence holding. Much of the increased burning of the Amazon during this decade can be traced back to the economic crisis.

There is a bumper sticker attributed to Harvard's president, Derek Bok, that says, "If you think education is expensive, try ignorance." We need one that says, "If you think economic development is environmentally damaging, try economic stagnation."

There is growing recognition that the economic interests and environmental security of the United States are affected by the destruction of natural resources in the South. That should be reflected in new forms of international cooperation. A year ago

the World Resources was asked by USAID, the Canadian development assistance agency, and the United Nations Development Program to explore ways by which we and other developed countries could promote a revival of more sustainable development in the South, through new financial and other forms of support. Our draft report of the International Conservation Financing Project was recently presented to the sponsors, and the executive summary is attached to this testimony.

There are many opportunities. I'd like to highlight two very briefly:

The International Environmental Facility: We have proposed that bilateral and multilateral development institutions join non-governmental organizations in a cooperative effort to overcome obstacles to increasing funding of development projects aimed at protecting or restoring the natural resource base. Compared to conventional infrastructure projects, many of which are environmentally harmful, such conservation-oriented projects require lengthy preparation, adaptive and flexible execution, fuller involvement of local institutions, and financing arrangements suited to longer payoff periods and non-commercial returns. While some agencies, including AID, are supporting such projects, the needs are orders of magnitude greater than what is currently being done. In the international arena, some development agencies that have the competence lack funding, while

some potential funding sources lack experience. Much could be gained by pooling resources in a cooperative facility, for which several precedents exist in other development areas.

Linking Debt Reduction to Sustainable Development

Several well-publicized "debt-for-nature" swaps retiring commercial bank loans to Latin American countries have excited interest. Through this mechanism foreign donations have been channeled to support conservation programs (as opposed to land transfers or set-asides) in host countries. Although the funds available through charitable contributions are limited, there are important opportunities to build on this concept through the debt reduction activities of the IMF and the MDBs stimulated by the "Brady Plan", which involve tens of billions of dollars.

Just as in the US examples cited above, developing countries can conserve natural resources in developing countries while reducing fiscal burdens and raising economic productivity. In the South too, inappropriate energy, forestry, agricultural, and water policies and misdirected development spending are aggravating environmental problems and impeding development. Resource policy adjustment can help generate resources for renewed growth and debt reduction. Until now, these issues have figured little in World Bank policy-based lending, and not at all in IMF adjustment lending, despite the policy endorsement by the

Joint Ministerial Committee of their Boards of Governors (Development Committee, Environment, Growth, and Development, Washington, D.C. August, 1987). By including natural resource management issues in policy adjustment lending linked to debt reduction, these institutions can contribute strongly to environmentally and financially sustainable development.

Attachments: "Wasting Assets: Natural Resources in the National Income Accounts"

Executive Summary

WASTING ASSETS: Natural Resources in the National Income Accounts

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WORLD RESOURCES INSTITUTE
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Foreword

"Sustainable development" has been defined variously as living on the planet's income instead of depleting nature's capital, as meeting the needs of today's population without compromising the ability of future generations to meet theirs, and as the management of natural, human, and financial assets so as to increase long-term wealth and well-being. By whatever definition, sustainable development is clearly an important objective for societies.

National income accounts, the information framework that countries use to analyze the performance of their economies and to determine gross and net national product, ought to encompass the concept of sustainability. And, indeed, they do in certain respects. Man-made assets, including plant and equipment, are valued as productive capital, and their depreciation is charged against the value of national production. But this treatment of capital depreciation in national income accounting does not extend to natural resource depletion. The result is what Robert Repetto and his co-authors refer to in this report as a "dangerous asymmetry." As he notes, "A country could exhaust its mineral resources, cut down its forests, erode its soils, pollute its aquifers, and hunt its wildlife and fisheries to extinction, but measured income would not be affected as these assets disappeared."

When the index by which we try to measure improvements in living standards ignores the loss of natural resources and the services they provide, policymakers can get very misleading signals, as the results reported here for Indonesia show. Temporary improvements in consumption can be purchased by permanent losses in wealth and productive capacity.

Few people who aren't economists even know what the accounts are, much less how they are calculated. And yet, whenever quarterly GNP figures are released, policymakers invariably find themselves on the line: constituents, reporters, and financial analysts all want to know why the economy's performance is up, down, or unchanged. No economic law says that natural resources and the services they provide can't be included in national income accounts. Indeed, principles of both economics and ecology argue that they should be. But how?

Wasting Assets: Natural Resources in the National Income Accounts demonstrates that natural resources can be treated similarly to capital in national accounts, and it argues convincingly that these accounts should be revised. Repetto and his co-authors don't stop at building a tight theoretical case. Using data from Indonesia, they provide a concrete example of how the revised accounts would work and what signals the new results would give to those who make decisions about economic development.

This report complements several others that WRI has conducted that seek to bring economic

and environmental thinking together in a new synthesis. *The Forest for the Trees: Government Policies and the Misuse of Forest Resources* (Robert Repetto, WRI, 1988), *Money to Burn? The High Costs of Energy Subsidies* (Mark Kosmo, WRI, 1987), *Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems* (Robert Repetto, WRI, 1986), *Paying the Price: Pesticide Subsidies in Developing Countries* (Robert Repetto, WRI, 1985), and *Public Policies and the Misuse of Forest Resources* (Robert Repetto and Malcolm Gillis, Cambridge University Press, 1988) all show how misguided economic incentives cost governments huge sums and distort investment decisions while inviting environmental abuse and wasting natural resources. In addition, related work is now under way at WRI on the economics of sustainable agriculture and international conservation financing options.

For support for all these studies and WRI's research program in general, we are deeply grateful to the John D. and Catherine T. MacArthur Foundation. Additional much-appreciated support for this study also came from the World Bank.

James Gustave Speth
President
World Resources Institute

I. The Need for Natural Resource Accounting

A. Overview and Recommendations

Whatever their shortcomings, and however little their construction is understood by the general public, the national income accounts are undoubtedly one of the most significant social inventions of the twentieth century. Their political and economic impact can scarcely be overestimated. However inappropriately, they serve to divide the world into "developed" and "less developed" countries. In the "developed countries," whenever the quarterly gross national product (GNP) figures emerge, policy-makers stir. Should they be lower, even marginally, than those of the preceding three months, a recession is declared, the strategies and competence of the administration is impugned, and public political debate ensues. In the "developing" countries, the rate of growth of GNP is the principal measure of economic progress and transformation.

The national accounts have become so much a part of our life that it is hard to remember that they are scarcely fifty years old. They were first published in the United States in the year 1942. It is no coincidence that the period during which these measures have been available, with all their imperfections, has been the period within which governments in all developed and most developing countries have taken responsibility for the growth and stability of their economies, and during which enormous investments of talent and energy have been made in understanding how economies can be better managed. Forecasting the next few quarterly estimates of these statistics has become, with no exaggeration, a hundred million dollar industry.

The aim of national income accounting is to provide an information framework suitable for analyzing the performance of the economic system. The current system of national accounts reflects the Keynesian macroeconomic model that was dominant when the system was developed. The great aggregates of Keynesian analysis—consumption, savings, investment, and government expenditures—are carefully defined and measured. But Keynes and his contemporaries were preoccupied with the Great Depression and the business cycle; specifically, with explaining how an economy could remain for long periods of time at less than full employment. The least of their worries was a scarcity of natural resources. Unfortunately, as Keynesian analysis largely ignored the productive role of natural resources, so does the current system of national accounts.

In fact, natural resource scarcity played little part in 19th century neo-classical economics, from which traditional Keynesian and most

contemporary economic theories are derived. Gone were the dismal predictions of Ricardo, Malthus, Marx, and other earlier classical economists that industrial economies would stagnate or collapse because of rising rents and subsistence wages. In 19th century Europe, steamships and railroads were markedly lowering transport costs while foodgrains and raw materials were flooding in from North and South America, Australia, Russia, and the imperial colonies. What mattered to England and other industrializing nations was the pace of investment and technological change. The classical economists had regarded income as the return on three kinds of assets: natural resources, human resources, and invested capital (land, labor, and capital, in their vocabulary). The neo-classical economists virtually dropped natural resources from their model and concentrated on labor and invested capital. When these theories were applied after World War II to problems of economic development in the Third World, human resources were also left out on the grounds that labor was always "surplus," and development was seen almost entirely as a matter of savings and investment in physical capital.

There is a dangerous asymmetry today in the way we measure, and hence, the way we think about, the value of natural resources.

As a result, there is a dangerous asymmetry today in the way we measure, and hence, the way we think about, the value of natural resources. Man-made assets—buildings and equipment, for example—are valued as productive capital, and are written off against the value of production as they depreciate. This practice recognizes that a consumption level maintained by drawing down the stock of capital exceeds the sustainable level of income. Natural resource assets are not so valued, and their loss entails no debit charge against current income that would account for the decrease in potential future production. A country could exhaust its mineral resources, cut down its forests, erode its soils, pollute its aquifers, and hunt its wildlife and fisheries to extinction, but measured income would not be affected as these assets disappeared. Ironically, low-income countries, which are typically most dependent on natural resources for employment, revenues, and foreign exchange earnings are instructed to use a system for national accounting and macroeconomic analysis that almost completely ignores their principal assets.

A country could exhaust its mineral resources, cut down its forests, erode its soils, pollute its aquifers, and hunt its wildlife and fisheries to extinction, but measured income would not be affected as these assets disappeared.

Underlying this anomaly is the implicit and inappropriate assumption that natural resources are so abundant that they have no marginal value. This is a misunderstanding. Whether they enter the marketplace directly or not, natural resources make important contributions to long-term economic productivity and so are, strictly speaking, economic assets. Many are under increasing pressure from human activities and are deteriorating in quantity or quality.

Another misunderstanding underlies the contention that natural resources are "free gifts of nature," so that there are no investment costs to be "written off." The value of an asset is not its investment cost, but the present value of its income potential. Many companies valued by the stock market as worth many billions of dollars have as their principal assets

the brilliant ideas and inventions of their founders: the Polaroid Camera, the Apple Computer, the Lotus Spreadsheet, for example. These inspired inventions are worth vastly more than any measurable cost to their inventors in developing them and could also be regarded as the products of genius—free gifts of nature.

Common formulas for calculating depreciation by "writing off" investment costs (e.g., straight line depreciation) are just convenient rules of thumb, or artifacts of tax legislation. The true measure of depreciation, which statisticians have tried to adopt for fixed capital in the national accounts, is the capitalized value of the decline in the future income stream because of an asset's decay or obsolescence. (Usher 1980, pp. 104–105) Thus, in the same sense that a machine depreciates, soils depreciate as their fertility is diminished since they can produce only at higher costs or lower yields.

This difference in the treatment of natural resources and other tangible assets reinforces the false dichotomy between the economy and the "environment" that leads policymakers to ignore or destroy the latter in the name of economic development.

Codified in the United Nations system of national accounts closely followed by most countries, this difference in the treatment of natural resources and other tangible assets provides false signals to policymakers. It reinforces the false dichotomy between the economy and the "environment" that leads policymakers to ignore or destroy the latter in the name of economic development. It confuses the depletion of valuable assets with the generation of income. Thus it promotes and seems to validate the idea that rapid rates of economic growth can be achieved and sustained by exploiting the resource base. The result can be illusory gains in income and permanent losses in wealth.

Indeed, natural resource assets are legitimately drawn upon to finance economic growth, especially in resource-dependent countries. The revenues derived from resource extraction finance investments in industrial capacity, infrastructure, and education. A reasonable accounting representation of the process, however, would recognize that one kind of asset has been exchanged for another, which is expected to yield a higher return. Should a farmer cut and sell the timber in his woods to raise money for a new barn, his private accounts would reflect the acquisition of a new asset, the barn, and the loss of an old asset, the timber. He thinks himself better off because the barn is worth more to him than the timber. In the national accounts, however, income and investment would rise as the barn is built, but income would also rise as the wood is cut. The value of the timber, less that of any intermediate purchases (e.g., gas and oil for the chainsaw) would be credited to value added in the logging industry. Nowhere is the loss of a valuable asset reflected. This can lead to serious miscalculation of the development potential of resource-dependent economies by confusing gross and net capital formation. Even worse, should the proceeds of resource depletion be used to finance current consumption, then the economic path is ultimately unsustainable, whatever the national accounts say. If the same farmer used the proceeds from his timber sale to finance a winter vacation, he would be poorer on his return and no longer able to afford the barn, but national income would only register a gain, not a loss in wealth.

Many countries now heavily burdened with debt are resource-dependent: Mexico, Venezuela, and Nigeria are oil exporters, for example. Their national balance sheets before the debt crisis deteriorated substantially as they

drew down natural resource assets and piled up external debt, using the proceeds of both to finance consumption and subsidize investments of little or no economic value. A national accounting system that drew attention to their deteriorating asset positions might have alerted policy-makers to the need for policy changes and international lenders to the growing risks of further exposure.

The fundamental definition of income encompasses the notion of sustainability. In accounting and in economics textbooks, income is defined as the maximum amount that the recipient could consume in a given period without reducing the amount of possible consumption in a future period. (Edwards and Bell 1961; Hicks 1946) Business income is defined as the maximum amount the firm could pay out in current dividends without reducing net worth. This income concept encompasses not only current earnings but also changes in asset positions: capital gains are a source of income, and capital losses are a reduction in income. The depreciation accounts reflect the fact that unless the capital stock is maintained and replaced, future consumption possibilities will inevitably decline. In resource-dependent countries, failure to extend this depreciation concept to the capital stock embodied in natural resources, which are such a significant source of income and consumption, is a major omission and inconsistency.

This is not academic hairsplitting. For resource-based economies, evaluations of economic performance and estimates of macroeconomic relationships are seriously distorted by failure to account for natural resource depreciation. In this report, Indonesia is used as an example. Over the past 20 years, Indonesia has drawn heavily on its considerable natural resource endowment to finance development expenditures. Revenues from production of oil, gas, hard minerals, timber, and forest products have offset a large share of government development and routine expenditures. Primary production contributes more than 43 percent of gross domestic product, 83 percent of exports, and 55 percent of total employment. *(Table I.1.)* Indonesia's economic performance over this period is generally judged to have been successful: per capita GDP growth averaging 4.6 percent per year from 1965 to 1986 has been exceeded by only a handful of low and middle-income countries, and is far above the average for those groups. Gross domestic investment rose from 8 percent of GDP in 1965, at the end of the Sukarno era, to 26 percent of GDP (also well above average) in 1986, despite low oil prices and a difficult debt situation. (World Bank 1988)

Estimates derived from the Indonesian country case study, presented in more detail in Part II of this report, illustrate how much this evaluation is affected by "keeping score" more correctly. Table I.2 and Figure 1 compare the growth of gross domestic product at constant prices with the growth of "net" domestic product, derived by subtracting estimates of net natural resource depreciation for only three sectors: petroleum, timber, and soils. It is clear that conventionally measured gross domestic product substantially overstates net income and its growth after accounting for consumption of natural resource capital. In fact, while GDP increased at an average annual rate of 7.1 percent from 1971 to 1984, the period covered by this case study, our estimate of "net" domestic product rose by only 4.0 percent per year. If 1971, a year of significant additions to petroleum reserves, is excluded, the respective growth rates from 1972 to 1984 are 6.9 percent and 5.4 percent per year, for gross and net domestic product.

The overstatement of income and its growth may actually be considerably more than these estimates indicate since only petroleum, timber, and soils on Java are covered. Other important exhaustible resources that have been exploited over the period, such as natural gas, coal, copper, tin, and nickel have not yet been included in the accounts. The depreciation of other renewable resources, such as non-timber forest products and fisheries, is also unaccounted for. When complete depreciation accounts are available,

Table I.1. Direct Contribution of Primary Production (%)

	Share of GDP 1983–1987	Growth Rate 1983–1987	Share of Merchandise Export 1987/88	Share of Employment 1985
Renewable Resources	**24.2**	**3.2**	**30.4**	**54.6**
Agriculture	21.3	3.5	13.7	
—Food crops	(14.8)	(2.2)	(0.6)	
—Other crops	(4.0)	(6.4)	(12.3)	
—Livestock	(2.5)	(6.6)	(0.8)	
Fishing	1.7	0.6	2.3	
Forestry[a]	1.2	2.5	14.4	
Exhaustible Resources	**19.7**	**3.0**	**53.3**	**0.8**
Oil & natural gas[b]	18.5	2.9	47.7	
Other mining	0.8	5.6	5.6	
Total Primary Sectors	**43.9**	**3.1**	**83.7**	**55.4**

a. Logs, sawn timber and plywood.
b. Includes crude oil and condensates, natural gas, LNG and LPG, but excludes other oil products.

Source: Central Bureau of Statistics and Bank Indonesia.

they will probably show a greater divergence between the growth in gross output and net income.

Other important macroeconomic estimates are even more badly distorted. Table I.3 and Figure 2 compare estimates of gross and net domestic investment, the latter reflecting depreciation of natural resource capital. This statistic is central to economic planning in resource-based economies. Countries such as Indonesia that are heavily dependent on exhaustible natural resources *must* diversify their asset base to preserve a sustainable long-term growth path. Extraction and sale of natural resources must finance investments in other productive capital. It is relevant, therefore, to compare gross domestic investment with the value of natural resource depletion. Should gross investment be less than resource depletion, then, on balance, the country is drawing down, rather than building up, its asset base, and using its natural resource endowment to finance current consumption. Should net investment be positive but less than required to equip new labor force entrants with at least the capital per worker of the existing labor force, then increases in output per worker and income per capita are unlikely. In fact, the results from the Indonesian case study show that the adjustment for natural resource asset changes is large in many years relative to gross domestic investment. In 1971 and 1973, the adjustment is positive, due to additions to petroleum reserves.[1] In most years during the period, however, the depletion adjustment offsets a good part of gross capital formation. In some years, net investment was negative. A

Table I.2. Comparison of GDP and "NDP" In 1973 Rupiah (billions)

Year	GDP[a]	Net Change in Natural Resource Sectors[b]			Net Change	NDP
		Petroleum	Forestry	Soil		
1971	5,545	1,527	−312	−89	1,126	6,671
1972	6,067	337	−354	−83	−100	5,967
1973	6,753	407	−591	−95	−279	6,474
1974	7,296	3,228	−533	−90	2,605	9,901
1975	7,631	−787	−249	−85	−1,121	6,510
1976	8,156	−187	−423	−74	−684	7,472
1977	8,882	−1,225	−405	−81	−1,711	7,171
1978	9,567	−1,117	−401	−89	−1,607	7,960
1979	10,165	−1,200	−946	−73	−2,219	7,946
1980	11,169	−1,633	−965	−65	−2,663	8,506
1981	12,055	−1,552	−595	−68	−2,215	9,840
1982	12,325	−1,158	−551	−55	−1,764	10,561
1983	12,842	−1,825	−974	−71	−2,870	9,972
1984	13,520	−1,765	−493	−76	−2,334	11,186
Average Annual Growth	**7.1%**					**4.0%**

a. In constant 1973 Rupiah, billions. From the Indonesian Central Bureau of Statistics.
b. The flow of resources in each sector is elaborated in the sections on the specific resource later in the text. Positive numbers imply a growth in the physical reserves of that resource during the year.

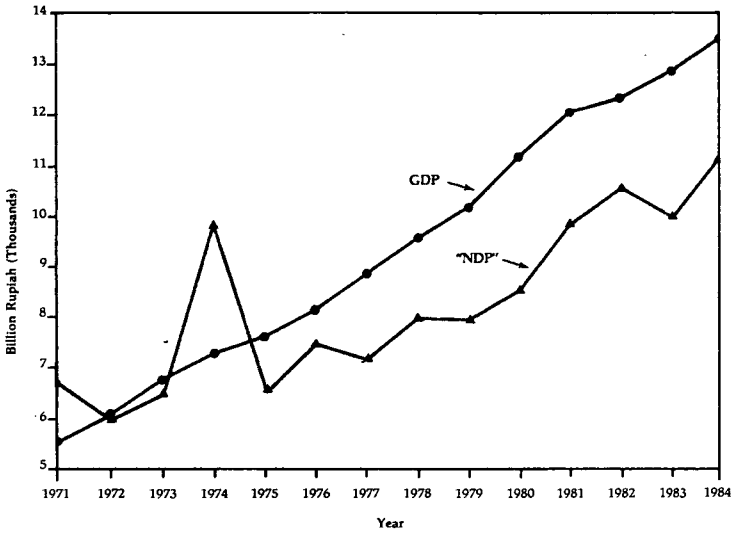
fuller accounting of natural resource depletion might conclude that in many years depletion exceeded gross investment, implying that natural resources were being depleted to finance current consumption expenditures.

Such an evaluation should flash an unmistakable warning signal to economic policy-makers that they were on an unsustainable course. An economic accounting system that does not generate and highlight such evaluations is deficient as a tool for analysis and policy in resource-based economies and should be amended.

The same holds true with respect to evaluation of performance in particular economic sectors, such as agriculture. Almost three-quarters of the Indonesian population live on the fertile but overcrowded "inner" islands of Java, Bali, and Madura, where lowland irrigated rice paddies are intensively farmed. In the highlands, population pressures have brought steep hillsides into use for cultivation of maize, cassava, and other annual crops. As hillsides have been cleared of trees, erosion has increased, now averaging over 60 tons per hectare per year, by our estimates.

Erosion's economic consequences include loss of nutrients and soil fertility from thin soils, and increased downstream sedimentation in reservoirs, harbors, and irrigation systems. Increased silt concentrations affect fisheries and

Figure 1. GDP and "NDP," in Constant 1973 Rupiah



downstream water users. Although crop yields have improved in the hills because farmers have used better seed and more fertilizers, the estimates presented in Part II imply that the annual depreciation of soil fertility, calculated as the value of the lost farm income, is about 4 percent of the value of crop production, which is as large as the annual production increase. In other words, these estimates suggest that *current* increases in farm output in Indonesia's uplands are being achieved almost wholly at the expense of potential *future* output. Since the upland population is unlikely to be smaller in the future than it is now, the process of soil erosion represents a transfer of wealth from the future to the present. By ignoring the future costs of soil erosion, the sectoral income accounts significantly overstate the growth of agricultural income in Indonesia's highlands.

Current *increases in farm output in Indonesia's uplands are being achieved almost wholly at the expense of potential* future *output.*

Table I.3. Comparison of GDI and "NDI"

Year	GDI[a]	Resource Depletion[b]	NDI
1971	876	1,126	2,002
1972	1,139	−100	1,039
1973	1,208	−279	929
1974	1,224	2,605	3,829
1975	1,552	−1,121	431
1976	1,690	−684	1,006
1977	1,785	−1,711	74
1978	1,965	−1,607	358
1979	2,128	−2,219	−91
1980	2,331	−2,663	−332
1981	2,704	−2,215	489
1982	2,783	−1,764	1,019
1983	3,776	−2,870	906
1984	3,551	−2,334	1,217

a. In constant 1973 Rupiah, billions. From the Indonesian Central Bureau of Statistics.
b. In constant 1973 Rupiah, billions. Includes depletion of forests, petroleum and the cost of erosion on the island of Java. These figures are explained fully in Part II.

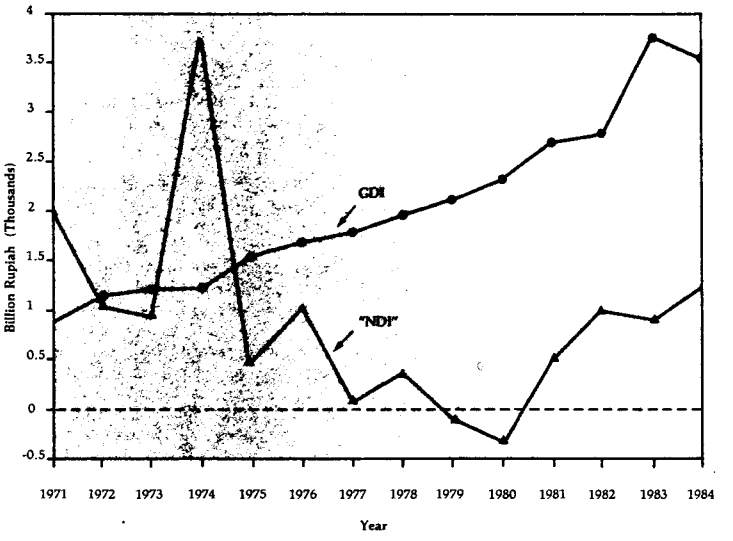
A considerable and growing body of expert opinion has recognized the need to remove this anomaly from the accounting framework by accounting for depreciation of natural resource assets like depreciation of other physical capital. In the words of a recent treatise on the measurement of economic growth, "Policymakers need, among other types of information, a set or sets of accounts which describe the significant dimensions of the system for which they are responsible ... a cogent argument can be made for the view that the present set of national accounts provides an increasingly deficient representation of the substantive economic activities taking place within the system, and that many of these deficiencies are capable of being remedied by using available data." (Juster 1973, pp. 26–27)

In June 1985, the member governments of the OECD adopted a "Declaration on Environment: Resources for the Future." They declared that they will "ensure that environmental considerations are taken fully into account at an early stage in the development and implementation of economic and other policies by ... *[inter alia]* ... improving the management of natural resources, using an integrated approach, with a view to ensuring long-term environmental and economic sustainability. For this purpose, they will develop appropriate mechanisms and techniques, including more accurate resource accounts." (OECD, 1986)

Our Common Future, the 1987 report of the World Commission on Environment and Development, stated, "Thus, figuring profits from logging rarely takes full account of the losses in future revenue incurred through degradation of the forest. Similar incomplete accounting occurs in the exploitation of other resources, especially in the case of resources that are not capitalized in enterprise or national accounts: air, water, and soil. *In all countries, rich or poor, economic development must take full account in its measurements of growth of the improvement or deterioration in the stock of natural resources."* (*Our Common Future,* p. 52)

Similarly, academic experts (Stauffer, 1983) and such international agencies as the OECD have recommended that capital consumption allowances be extended to natural resource assets, such as mineral deposits (OECD, 1986). The World Bank and the United Nations Environment Programme have emphasized the deficiencies in the current accounting system and have sponsored work on improvements. According to a recent Bank publication, "GDP is essentially a short-term measure of economic activity for which exchange occurs in monetary terms. It is of limited usefulness to gauge long-term sustainable growth, partly because natural resource depletion and degradation are being

Figure 2. GDI and "NDI," in Constant 1973 Rupiah



ignored under current practices." (Lutz and El-Sarafy 1988)

A number of OECD member governments, including Canada, France, Netherlands, Australia, and Norway, have carried on substantial statistical work programs to compile accounts on natural resource stocks and stock changes. France and Norway have made perhaps the most extensive official estimates, France's patrimony accounts have emphasized the development of physical accounts. (Weber 1983) Norway's resource accounts for energy and other significant economic resources have stressed integration with macroeconomic models and budgets. (Alfsen, Bye and Lorentsen 1987) There is a detailed estimate of the national balance sheet of the United States that includes values for timber and subsoil assets, and an important study of national balance sheets covering twenty countries by the same scholar. (Goldsmith, 1982, 1985)

Within the last few years, governments in developing countries, recognizing their natural resource dependence, have become interested in a more adequate accounting framework. The World Resources Institute is collaborating on

pilot studies with government research institutes and statistical agencies in Indonesia, Costa Rica, and the People's Republic of China. Other governments considering new work programs in natural resource accounting include Thailand, the Ivory Coast, and Argentina. Policy-makers in these countries recognize the need for a planning tool that more effectively integrates economic and ecological considerations.

In filling this need, the United Nations Statistical Office has an important role to play. The U.N. System of National Accounts provides a standard and model that, at least in its core flow accounts, is closely followed by most countries. The U.N. Statistical Office is also a worldwide source of expertise and guidance in the development of national income and other statistical systems.

The system of national accounts (SNA) published by the United Nations Statistical Office (United Nations 1968) is more complete with respect to natural resource accounting than are the accounting systems actually implemented by most national governments. The SNA provides for balance sheets that record opening and closing stocks, and sources of increase and decrease. Such accounts are included for reproducible tangible assets, such as tree plantations, and non-reproducible tangible assets, such as agricultural land and subsoil minerals. The criterion for inclusion in the SNA is whether the assets are privately owned and used in the commercial production of goods and services so that economic values can be established. Natural resources in the public domain, such as surface waters, atmosphere, and wilderness, are excluded on the grounds that the SNA deals with the market economy and that the economic values of natural resources outside the market system cannot readily be established.

For natural resource assets included in the SNA, the accounting framework provides for "reconciliation accounts" that link balance sheet and flow accounts. These revaluation accounts encompass changes in opening stocks due to changes in prices during the period, and due to physical changes such as growth, discoveries, depletion, extraction, and natural losses. The valuation principle endorsed by the United Nations for use in these accounts is market asset value, when possible. When direct asset value cannot be established, the U.N. guidelines endorse the economic asset-valuing principle discussed above: the present value of the expected future income stream obtainable from the resource is the measure of the resource's asset value.

The U.N. Statistical Commission, advised by a number of expert working groups, is currently considering changes in the SNA, as it does periodically. Dissatisfaction stems from many inconsistencies and omissions in the current system. For example, production of goods and services outside the enterprise sector, notably by households, is largely omitted. Also, along with natural resources, other kinds of capital assets, such as knowledge and the stock of skills possessed by the workforce are ignored. Furthermore, in the government sector, the goods and services produced are not directly measured, but are valued at their factor cost. These and many other deficiencies have led to a long agenda of suggested improvements.

Although deliberations will continue until 1991, the U.N. Statistical Commission has evidently already reached the decision that there should be no fundamental changes in the existing SNA. The existing accounting methodology is protected, in a sense, by its very inadequacy: wholesale reform is a large task, and improvement limited to just one aspect is hard to justify when so many other problems would still remain. Moreover, both at the national and international level, decisions regarding the accounting system are in the hands of the *producers* of statistics, not the users. The national income accounts are like sausages: there are many consumers, but few who want to know how they are put together. Partly for this reason, decisions are dominated by the

concerns of national income statisticians, who are typically handicapped by shortages of staff, budgets, and raw data. These statisticians are resistant to recommending changes when so much work remains to be done before the *existing* SNA can be fully implemented.

National income accounts are like sausages: there are many consumers, but few who want to know how they are put together.

With respect to depreciation accounts for natural resources, therefore, the expert committees of the U.N. Statistical Office have taken the position that countries should be encouraged to implement balance sheet accounts for reproducible and non-reproducible tangible assets and link those to conventional national income measures through "satellite accounts," as indicated in the present system. In other words, their position is that depletion accounts for natural resources should be calculated, but kept apart from the main tables. The measure of depreciation in the national income accounts should not be extended to include natural resources, and the present misleading indicators of economic performance should be maintained.

The rationale for this position is pragmatic: until more national statistical offices are capable of estimating depreciation accounts for natural resource assets, the core national income accounts should not be modified. Any estimates of natural resource balance sheets and depreciation should be displayed in ancillary tables, so that users can make their own evaluations.

Therefore, from the statistician's perspective, the amount of effort required to implement natural resource accounts is important. The Indonesian country case study was implemented partly to obtain first-hand information about the level of effort needed to prepare numerical estimates. The accounts presented in this report were prepared almost entirely by predoctoral and master's level graduate students. Enough information to make reasonable estimates was found to be already available, so that compilation and reorganization of data were the main tasks. In this pilot study, without prior experience, working solely with existing data (no fresh field surveys were conducted), without the access to data a government statistical office would have, researchers spent approximately 12 person-months mostly in the United States. This modest input generated estimates that shed substantial new light on Indonesia's growth performance over more than a decade.

Only if the basic measures of economic performance, as codified by the official national accounting framework, are brought into conformity with a valid definition of income will economic policies be influenced toward sustainability.

The importance of bringing such estimates into the main national income accounts, rather than relegating them to "satellite" or "reconciliation" accounts, is demonstrated by events of the past decade. While virtually all countries calculate national income accounts, few have implemented the United Nation's recommendations with respect to ancillary tables in the SNA because with limited resources they have had to "stick to the basics." Similarly, despite their recognized deficiencies, politicians, journalists, and even sophisticated economists in official agencies continue to use GDP growth as the prime measure of economic performance. (In the first statistical table of the World Bank's annual *World Development Report,*

for example, entitled, "Basic Indicators," the economic indicators are GDP, GDP growth per capita, and the rate of inflation.) Only if the basic measures of economic performance, as codified by the official national accounting framework, are brought into conformity with a valid definition of income will economic policies be influenced toward sustainability.

There is ample time before the revisions to the SNA are announced for the U.N. Statistical Office to explore fully the implications of extending the concept of depreciation to natural resource assets. It should use this time to prepare for that change. At the same time, key international economic institutions, such as the World Bank, other multilateral development banks, the IMF, and the OECD, should begin to compile, use, and publish revised estimates of net national product and national income, as this report has done. All these institutions should ready themselves to provide technical assistance to the growing number of national statistical offices that wish to adopt these changes and make such estimates for themselves.

B. Current National Income Accounting

1. Imputations and the Treatment of Depreciation

The market economy—goods and services exchanged for financial consideration—broadly limits the scope of national income accounts. For this reason, intra-household production and exchanges are excluded, except for subsistence agricultural production. Nonetheless, the accounts often do impute values to important economic activities that take place without any market transaction. For example, the rental value of owner-occupied housing is treated as if the owner rented the premises to himself. The criteria used to judge whether nonmarket activities should be included in national accounts are (1) whether they are directly comparable to production taking place in the market, and (2) whether their value can be reliably measured, given the statistical resources.

An imputed value of particular concern here is for the consumption of capital stock. The value of capital goods, such as structures and equipment, declines over time with use because of physical wear and obsolescence. This gradual decrease in the future productive potential of capital goods is reflected in the national accounts by a depreciation allowance that amortizes the asset's value over its useful lifetime. There are markets for some used capital goods, such as vehicles, from which depreciation factors can be estimated. Otherwise, amortization is a surrogate measure for the loss of income-generating capacity of older assets. Straight-line depreciation and other formulas are imputations for this loss of value.

Depreciation of tangible reproducible capital is subtracted from gross national product (GNP) in calculating the net national product (NNP) and national income. A nation must invest enough in new capital goods to offset the depreciation of existing assets if the future income-producing ability of the entire capital stock is to be preserved. Therefore, according to the definition of income given above, this capital consumption allowance must be excluded from total production. However, this procedure is applied only to structures and equipment, not to natural resources or other types of assets. NNP should provide a more useful measure of economic performance than GNP but generally receives less attention in economic policy planning. As currently defined and estimated to include only buildings and equipment assumed to depreciate at fixed rates, gross and net product tend to move closely together. However, ignoring or underestimating the deterioration or depletion of the capital stock can lead to economic policy errors with serious, long-term consequences.

2. Income Statements and Balance Sheets

A complete system of financial accounts consists of two parts, one (the *income statement*)

dealing with transaction flows over a period of time, and the other (the *balance sheet*) with stocks of tangible and financial assets at different points in time. The concepts of production, consumption, revenues and costs relate to transaction flows within accounting periods. The national economic accounts in which they appear are comparable to income statements in business accounting. In contrast, balance sheets comprise stocks or levels of assets, liabilities and net worth at the end of accounting periods. Flows and stocks are linked, in that flows are equal to differences between stocks, and that stocks are equal to accumulated past flows.

National balance sheets provide a picture of a country's tangible and financial wealth at different points in time, facilitating intertemporal and international economic structural comparisons. The evaluation of a nation's future potential for sustained income generation can be enhanced by the detailed analyses of national assets and liabilities, through the preparation of national balance sheets. In the United Nations' SNA, the importance of balance sheets and wealth estimates for economic analysis, are fully recognized, and the SNA includes models and an explicit recommendation to construct national balance sheets. However, while neither business firms nor households would ignore significant changes in their balance sheets, few national governments even calculate theirs.

At least in concept, the United Nations has endorsed accounting for certain natural resources. SNA specifically includes forests and subsoil assets (e.g., oil and gas reserves) in model national balance sheets. Two principal approaches to valuing assets have been endorsed for application to natural resources. These are (1) the use of values derived from market transactions in assets, and (2) the use of the discounted present value of estimated future income flows derived from the assets to be valued. For example, the SNA guidelines (United Nations 1977) suggest that the value of timber tracts should be based upon market data if available, taking account of timber type and the situation and character of the land. If there have been insufficient market transactions in timber to provide estimates, standing timber should be valued by discounting the future proceeds of selling the timber at current prices after deducting management and harvesting costs. An identical approach is suggested with respect to subsoil assets, using as a discount rate a rate of return "expected by investors in mining or quarrying enterprises."

Neither the United Nation's SNA nor the national income accounts of any country now integrates the treatment of natural resource between income and balance sheet accounts. Final sales to consumers are included on the product side; on the income side, the value added from resource extraction is included in wages and salaries, in rental incomes and in company profits. In other words, the *total* value of current production, net of purchased inputs, is imputed to current income.

There are no accounting entries in the flow accounts for depletion, growth (in the case of forests), discoveries (in the case of subsoil assets) or asset revaluation due to price changes. Only capital investments in durable structures and equipment used in the industry are subject to depreciation, not the resources themselves. There is no depreciation factor in the flow accounts to represent the loss of forests, the depletion of minerals, the erosion of soils, or the deterioration of water resources, even though these user costs impair the future income-generating capacity of those assets.

The U.N. recommends instead that these balance sheet valuation adjustments should flow through reconciliation accounts and not the current income accounts. The SNA guidelines suggest, for example, that reductions in the market value of land due to erosion be reflected in the reconciliation accounts. (United Nations 1977) An expert group of the United Nations has expressed general support for a calculation of the change in the value of proven subsoil mineral reserves that would

include allowances for both depletion and new finds, as well as the effects of price changes. This group recommended that the resulting adjustments also flow through the reconciliation accounts (United Nations 1980), leaving GNP and NNP unadjusted.

In arguing for keeping such asset revaluations in satellite accounts, the U.N. guidelines pointed out that large and sudden revaluations of subsoil asset values as a result of (1) extensive new discoveries; (2) changes in technology increasing the range of exploitable reserves; or (3) changes in market conditions could markedly affect estimates of current income if admitted into the flow accounts. This position ignores the fact that changes in technology or market conditions can equally affect the reproducible capital stock. Energy price shocks, for example, first made most older heavy industrial equipment economically worthless because at high energy prices those plants could not produce at a profit. The same fluctuations in energy markets led to drastic inflation, then deflation, in real estate values in oil-producing regions, such as Texas. The income accounts were insulated from these changes in asset values only because depreciation rates are estimated at constant "book" values, a procedure equally applicable to natural resource assets. The impact of capital consumption allowances for natural resources on the national income accounts would depend, as it should, entirely on the importance of natural resources to the particular economy.

In essence, reconciliation accounts provide a means of recording changes in the value of net assets between successive measurement dates *without having to show any effect on the income of the intervening period.* Recording these adjustments in reconciliation accounts is likely to minimize their consideration in national policy analysis. Therefore, while it is significant that the United Nations has specifically endorsed the principle of valuing natural resource assets and asset changes in the system of national accounts, the procedure they have recommended would still leave the income account seriously biased as an estimate of economic performance.

C. The Scope of Natural Resource Accounting

A number of developed countries have proposed or set up systems of environmental accounts, including Norway, Canada, Japan, the Netherlands, the United States, and France. These systems have been reviewed in detail and evaluated for the United Nations Environment Programme by Weiller (1983) and Friend (1983). While natural resources take priority in Norway and France, pollution and environmental quality have been the focus in the United States and Japan. The approaches of Canada and the Netherlands combine elements of both approaches.

In both Norway and France, extensive systems of resource accounting have been established to supplement their economic accounts. The Norwegian system of natural resource accounting and the past decade's experience with it has recently been described. (Alfsen, Bye, and Lorentsen, 1987; Garnasjordet and Saebo, 1986) Accounts have been compiled for "material" resources, such as fossil fuels and other minerals, such "biotic" resources as forests and fisheries, and such "environmental" resources as land, water, and air. The accounts are compiled in physical units of measurement, and not integrated with the national income accounts. However, resource accounts, especially those for petroleum and gas, have been expressed in value terms for use in macroeconomic planning and projection models maintained by the Central Bureau of Statistics.

The French natural patrimony accounts are intended as a comprehensive statistical framework to provide the authorities with the facts and data they need to monitor the state and changes in "that subsystem of the terrestrial ecosphere that can be quantitatively and qualitatively altered by human activity."

(Corniere, 1986) They are conceptually broader than the national income accounts: material and energy flows to and from economic activities form only a subset of the accounts. (Commission Interministerielle des Comptes du Patrimoine Naturel, 1983) Methodology and empirical estimates have been under development since 1971, and they now cover the same range of resources as Norway's: non-renewables, the physical environment, and living organisms. The basic accounting units are physical, with provision for monetary valuation of stocks and flows that are marketed or contribute directly to market production. (Weber, 1983)

The construction of such frameworks for the compilation of environmental statistics may well encourage decision-makers to consider the impact of specific policies on the national stock of natural resources. However, a physical accounting approach *by itself* has considerable shortcomings. On the one hand, it does not lend itself to useful aggregation. Aggregating wood from various species of trees in physical units (cubic meters) obscures wide differences in the economic value of different species. Aggregating reserves of a mineral in physical units (tons) obscures vast differences in the value of different deposits, due to grade and recovery cost. On the other hand, maintaining physical accounts in disaggregated detail results in a mountain of statistics that are not easily summarized or used.

A further problem is that accounts maintained in physical units do not enable economic policy-makers and planners to understand the impact of economic policies on a nation's natural resources and thereby to integrate resource and environmental considerations into economic decisions—presumably, the main point of the exercise. While the information from the physical resource accounts undoubtedly facilitates the assignment of monetary values to balances and transaction flows (as will be described in this paper) from the perspective of *economic* policy, it is only an intermediate step. (Theys, 1984) Yet, there is no conflict between accounting in physical and economic units because, as the Indonesian case study shows, physical accounts are necessary prerequisites to economic accounts. If the measurement of economic depreciation is extended to natural resources, physical accounts are inevitable by-products.

There is no conflict between accounting in physical and economic units because physical accounts are necessary prerequisites to economic accounts. If the measurement of economic depreciation is extended to natural resources, physical accounts are inevitable by-products.

Notwithstanding these points, there are limits to monetary valuation, set mainly by the remoteness of the resource in question from the market economy. Some resources, such as minerals, enter directly. Others, such as subsurface water, are extensively used as inputs to market production, and although they are rarely bought and sold, values can be readily imputed. Others, however, such as noncommercial wild species, do not contribute directly to production and can be valued in monetary terms only through quite roundabout methods involving numerous, somewhat questionable, assumptions. While methodological and empirical research into the economic value of resources that are remote from market processes is to be encouraged, common sense suggests that highly speculative values should not be included in official accounts.

In industrialized countries experiencing increasingly acute problems of pollution and congestion while becoming less dependent on agriculture, mining, and other forms of primary production, the focus of attention has

been on "environmental" rather than natural resource accounting. Since Nordhaus & Tobin (1973) proposed their "measure of economic welfare" as an alternative to GNP, several different approaches to the development of more comprehensive systems of national income accounting have been described that go well beyond the scope of natural resource accounting described above. An excellent recent survey of these approaches is available. (Eisner, 1988) Each reflects their authors' particular concerns (e.g., Daly, in press; Hueting 1980, 1984; Peskin 1980; Peskin & Peskin 1976, 1978). For example, Herfindahl & Kneese (1973) considered how GNP might be modified by the costs and benefits associated with pollution and its abatement. Others have proposed general systems to account for the impacts of economic activities on the quality of the environment more broadly defined.

Problems with the current framework are obvious since they lead to bizarre anomalies. If toxic substances leak from a dumpsite to pollute soils and aquifers, measured income does not go down, despite possibly severe impairment of vital natural resources. If the government spends millions of dollars to clean up the mess, measured income rises, other things equal, because such government expenditures are considered to be purchases of final goods and services. If industry itself undertakes the cleanup, even if under court order, income does not rise because the same expenditures are considered to be intermediate production costs if carried out by enterprises. If the site is not cleaned up, and nearby households suffer increased medical expenses, measured income again rises because household medical expenses are also defined as final consumption expenditures in the national income accounts.

Although the system that gives rise to such results is widely regarded as faulty, there is little consensus on the remedy. Suggested approaches can initially be classified into those involving physical accounting and those that attempt to establish monetary values. The physical approach rests on a straightforward extension of input-output analysis to keep track of "deliveries" of various material from various resource stocks to producing and consuming sectors, and "deliveries" of materials from producing and consuming sectors to various receiving bodies in the environment. (Leontief, 1970; Kneese, Ayres, & d'Arge, 1970) Thus, for example, each industrial sector's discharges of waste materials to water, land, and air are estimated, along with each sector's use of water, primary raw materials, land, and other natural resources.

This approach conceptually straightforward and empirically feasible, has the virtue of bringing common economic models of "production" and "consumption" into approximate accord with the physical laws of nature. Moreover, the data thus organized provides an important intermediate step toward approaches that do involve estimation of monetary values. However, the plausible assumption of approximate linearity in the relation of waste generation to production and consumption activities cannot be carried over to the effects of emissions on environmental quality, or to the effects of environmental quality on human welfare. Both of these linkages are often highly non-linear, due to thresholds and chemical or biological interactions.

Establishing monetary accounts for changes in environmental quality is by no means so straightforward. While all would agree in principle that a good environment yields a continuing flow of beneficial goods and services, valuing those benefits is complex. For one thing, the existing accounts already reflect some of those values, but not others, so that there is the danger of double-counting along with that of omitting important elements of income. Agricultural output, yields, and income, for example, already reflect the environmental inputs of sunshine and precipitation, which make purchased inputs more productive. Increased concentrations of ozone and other air pollutants reduce agricultural yields and thus diminish measured income in the existing accounts. Environmental deterioration, insofar as it raises current production costs or reduces

productivity, is already reflected in the accounts of the enterprise sector.

The glaring omission is the direct value of environmental quality or quality changes to the household. In principle, the damages to individuals from increasing pollution, congestion, and noise can be estimated by measuring willingness to pay, lost productivity, or needed defensive expenditures. Despite a large body of research literature on methodological and statistical problems, the task would be formidable if attempted on a national scale and remains in the realm of research rather than accounting.

The notion of "defensive" expenditures is elusive, since spending on food can be considered a defence against hunger, clothing a defence against cold, and religion a defence against sin.

On the other side of the ledger, there are problems—although perhaps not so serious—in improving the accounting of expenditures undertaken to prevent or remedy environmental damages. These problems can be brought into focus by assuming that households and enterprises are forced to spend more and more as the economy grows to maintain a constant level of environmental quality. (Juster, 1973) One anomaly might be addressed by treating such expenditures as intermediate purchases when undertaken by households and governments, as they now are when undertaken by enterprises. However, this immediately raises the broader question of treating as intermediate expenses a wide range of outlays by governments and households that have the basic function of maintaining productivity (including, for example, traffic control, health maintenance, and so on). The notion of "defensive" expenditures is elusive, since spending on food can be considered a defence against hunger, clothing a defence against cold, and religion a defence against sin.

Another difficulty is in establishing the boundary between outlays to maintain environmental quality and those undertaken for other purposes. A household's purchase of a water filter, or a firm's installation of a water treatment plant, might be readily identified. However, a household's move to another region with a superior environment, or a firm's adoption of an intrinsically low-residuals process technology would probably not.

There has been little consensus on the principles or quantification of proposals for broader environmental quality accounting so far, though the discussion has helped highlight the importance of incorporating environmental protection and effective natural resource management in national economic planning. However, for most developing countries and other resource-based economies, it is more relevant to think of natural resources as productive assets than as consumer goods. The first priority is to account for those disappearing assets in a way that gives due emphasis to the costs.

D. Setting Up Natural Resource Accounts

1. Physical Accounts

Natural resource physical stocks and any changes in those stocks during an accounting period can be recorded in physical units appropriate to the particular resource. The basic accounting identity is that opening stocks *plus* all growth, increase or addition *less* all extraction, destruction, or diminution *equals* closing stocks. Although the following discussion refers to oil and gas reserves and timber stocks as examples, the principles are applicable to many other resources.

Oil and natural gas resources, the former measured in barrels and the latter in barrel-equivalents, consist of identified reserves and other resources and identified reserves can be divided into proven reserves and probable reserves. Proven reserves are the estimated

quantities of oil and gas that geological and engineering data indicate with reasonable certainty to be recoverable from known reservoirs under existing market and operating conditions—that is, prices and costs as of the date the estimate is made. Probable reserves are quantities of recoverable reserves that are less certain than proven reserves. Thus, one limit on the stock of reserves is informational. Additional proven reserves can usually be generated by drilling additional test wells or undertaking other exploratory investments to reduce uncertainty about the extent of known fields. The boundary between reserves and other resources is basically economic. Vast quantities of known hydrocarbon deposits cannot be extracted profitably under current conditions. They are thus known resources, but cannot be counted as current reserves, though price increases or technological improvements might transform them into reserves in the future.

For other mining industries, geological characteristics tend to be known with more certainty, so there is less distinction between proven and probable reserves but a sharp division between economic reserves and total resources. Many minerals are present at very low concentrations in the earth's crust in almost infinite total amounts. (Goeller & Weinberg, 1984) Technological changes in mining and refining processes have markedly reduced the minimum ore concentrations that can profitably be mined, correspondingly expanding mineral reserves.

A similar framework is applicable to sub-soil deposits of water in available aquifers, except that accounting for changes in stocks must take into consideration the annual recharge. Accounting for water *quality* changes encounters problems that illustrate the limitations of physical accounting. Quality changes can be reflected in economic valuation rather readily, if they affect treatment costs or the economic uses to which water can be put. However, the numerous dimensions of quality, reflecting contamination by many other substances in varying concentrations and combinations, makes the construction of discrete physical categories difficult.

Changes in oil and gas stocks may be classified under various headings. Landefeld & Hines (1982) include under additions to reserves: "discoveries," the quantity of proven reserves that exploratory drilling finds in new oil and gas fields or in new reservoirs in oil fields; "extensions," increases in proven reserves because of subsequent drilling showing that discovered reservoirs are larger than originally estimated; and, "revisions," increases in proven reserves because oil or gas firms acquire new information on market conditions or new technology. Extensions of and revisions to oil and gas reserves have historically been significantly larger than new discoveries. Landefeld & Hines (1982) point out that reserve statistics generally produce very conservative estimates of the total resource stocks that will ultimately enter the economic system. Soladay (1980) estimated that actual production from new U.S. fields and reservoirs was over seven times the amount initially reported as discovered.

Reserve levels fall because of extraction and downward revisions. In the United States, oil and gas companies are required by the Securities and Exchange Commission to disclose net annual changes in estimated quantities of oil and gas reserves, showing separately opening and closing balances; revisions of previous estimates (from new information); improved recovery (resulting from improved techniques); purchases and sales of minerals in place; extensions and discoveries; and, production. (FASB 1977)

The accounting framework for timber resources in physical units could be expressed in hectares, in tons of biomass, or in cubic meters of available wood (Weber 1983), though the last is probably the most important economic measure. As in the case of minerals, the total resource is larger than the economic reserve since a substantial part of the total stock of standing timber in any country cannot be profitably harvested and marketed with current technologies and market conditions.

Additions to the timber stock can originate from growth and regeneration of the initial stock, and from reforestation and afforestation. Reductions can be classified into production (harvesting); natural degradation (fire, insect infestations, etc.); and, deforestation by man. Separate accounts might be established for different categories of forests—for example, virgin production forests, logged (secondary) forests, protected forests, and plantations. In temperate forests, where species diversity is limited, timber stocks are further disaggregated by species.

Physical accounts can be constructed along similar lines for agricultural land. Land and soil maps and classification systems are used to disaggregate land into productivity categories. Changes in stocks of each land category within a period reflect various phenomena: conversion to non-agricultural uses; conversion to lower productivity classes through physical deterioration by erosion, salinization, or waterlogging; and conversions to higher productivity classes through physical improvements by irrigation, drainage, and other investments. A set of physical accounts for agricultural land would record stocks of land at each accounting date by productivity class, and flows among classes and to other land uses according to cause.

Similarly, physical accounts can be set up for other biological resources, such as wildlife or fish populations. The principles are essentially those of demography. Additions to initial populations are attributed to fertility, estimated from reproduction rates and the size of the breeding population, and inmigration. Subtractions from stocks are attributed to natural mortality, estimated from age-specific or general mortality rates, harvesting operations, other special sources of mortality, and outmigration.

2. *Valuation Principles*

The concept of economic rent is central to natural resource valuation. Economic rent is defined as the return to any production input over the minimum amount required to retain it in its present use. It is broadly equivalent to the profit that can be derived or earned from a factor of production (for example, a natural resource stock) beyond its normal supply cost. For example, if a barrel of crude oil can be sold for $10 and costs a total of $6 to discover, extract, and bring to market, a rent of $4 can be assigned to each barrel.

Rents to natural resources arise from their scarcity and from locational and other cost advantages of particular stocks. These rents are distinct from monopoly rents, which increase returns to a factor of production beyond its opportunity cost by restricting supply through market power or government action. In principle, rents can be determined as the international resource commodity price less all factor costs incurred in extraction, including a normal return to capital but excluding taxes, duties and royalties. Thus, the economic rent is equivalent to the net price.

This is the same concept of rent that appears in a Ricardian scarcity model, which assumes that resources from different "deposits" will be supplied at a rising incremental cost until profit on the marginal source of supply is completely exhausted. In this Ricardian model, rents arise on relatively low-cost, infra-marginal sources of supply.

It is also equivalent to a user cost in a Malthusian scarcity model, which assumes that a homogeneous exhaustible resource is exploited at an economically efficient rate, such that the profit on the marginal amount brought to market is equal to the expected return derived from holding the asset in stock for future capital gain. (Hall & Hall 1984) In such a Malthusian model, if the resource is being extracted at an efficient rate, the current rent on the last unit of resources extracted is thus equal to the discounted present value of future returns from a unit remaining in stock.

As Ward (1982) has pointed out, the gross operating surplus of the extractive sector in the SNA, represented by the sum of the profits

made by all the different enterprises involved in resource extraction activities, does not represent true rewards to factors of production alone but also reflects rents from a "one time only" irredeemable sale of a non-renewable natural asset. By failing to measure an appropriate depletion allowance, conventional national accounting procedures allocate a disproportionate share of current income flows to present generations at the expense of future generations. The basic definition of income as the amount that can be consumed without becoming worse off is clearly being infringed as the value of the asset base declines.

Ward presents the sad exemplary tale of Kiribati, the small atoll republic of the Solomon Islands, which depended throughout the 20th century on its phosphate mines for income and government revenues. While the mines ran, gross domestic product was high and rising, but the mining proceeds were treated as current income rather than as capital consumption. When the deposits were mined out in the 1970s, income and government revenues declined drastically because far too little had been set aside for investment in other assets that would replace the lost revenues.

It would seem reasonable to apply this argument, not only to all soil and subsoil assets, but also to tropical forests which, though theoretically renewable, are being removed without adequate provision being made for their replacement in many areas. In forest economics, the concept of "stumpage value" is very close to that of economic rent. Stumpage value represents timber sale proceeds, less the costs of logging, transportation, and processing. Better quality and more accessible timber stands will command a higher stumpage value.

Asset transactions in natural resources, such as competitive auction sales of rights to extract timber or minerals, closely follow estimated stumpage values or rents, with allowance for risk. Because holders of those rights can usually hold the resources in stock or bring them to market immediately, the current rent or stumpage value tends to reflect the present value of expected future net income that can be derived from them.

This principle is readily extended to other resources: agricultural land can be valued directly on the basis of its current market worth, or indirectly as the present value of the future stream of net income, or annual rent, that can be derived from it. The value of subsurface irrigation water deposits can be estimated from market transactions in "water rights," or by comparing the value of agricultural land overlaying a usable, known, aquifer with that of otherwise equivalent land without subsurface water. Alternatively, it can be estimated as the present value of future rents, calculated as the difference between the costs (per cubic meter) of supplying the water for irrigation and the incremental net farm income attributable to the use of the water for irrigation. The value of a fishery could be estimated, in principle, as the maximum amount of revenue that a government authority could collect in bids from potential fishermen for the rights to participate in the catch. Alternatively, it could be estimated as the present value of the net income fishermen could derive from the catch under optimal regulation. In a world of frictionless, competitive markets, these valuation methods would yield the same results.

If adjustments to national income accounts for natural resource stock changes are to attain broad acceptance, a credible standard technique for valuing natural resources must be adopted that can be applied to various resources by statisticians in different countries.

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for valuing natural resources must be adopted that can be applied to various resources by statisticians in different countries. That method must be as free as possible from speculative estimates (about future market prices, for example) and must depend on underlying data that is reasonably available to statistical agencies.

Landefeld & Hines (1985) have recently compared the three principal methods discussed above for estimating the value of natural resource stocks: 1) the present value of future net revenues; 2) the transaction value of market purchases and sales of the resource *in situ;* and 3) the net price, or unit rent, of the resource multiplied by the relevant quantity of the reserve.

The present value method requires that future prices, operating costs, production levels, and interest rates be forecast over the life of for example, a given oil field, after its discovery. The present value of the stream of net revenue is then calculated, net revenue representing the total revenue from the resource less all extraction costs. Soladay (1980) extends the present value method by attempting to take into account the upward revisons in estimates of reserves that typically occur subsequent to the initial discovery. The United Nations Statistical Office has recommended use of the present value method when market values for transactions in resource stock are not available. (United Nations 1979)

The net price method applies the prevailing average net price per unit of the resource (current revenues less current production costs) to the physical quantities of proved reserves and changes in the levels of proved reserves. Landefeld and Hines make the important point that while the net price method requires only current data on prices and costs, it will be equivalent to the other two methods if output prices behave in accordance with long-run competitive market equilibrium. "Equilibrium in natural resource markets (where the net price rises in accordance with the rate of return on alternative investments) produces the interesting result that depletion as measured by changes in the present value of the resource equals depletion as measured by the net price method." (Landefeld & Hines 1985, p.14) The assumption here is derived from the theory of optimal depletion of exhaustible resources, that resource owners will tend to arbitrage returns from holding the stock into future periods with returns from bringing it immediately to market, adjusting current and future supplies until price changes equate those returns. (Dasgupta, 1982) When expected future increases in the net price take place at a rate equal to the return on alternative investments, these increases would therefore be eliminated in the calculation of the net present value of future cash flows. (Miller & Upton, 1985)

A number of recent studies (Boskin et al. 1985; Landefeld & Hines 1982, 1985; Soladay 1980; Ward 1982; Lutz and El-Sarafy 1988, Devarajan and Wiener 1988) have considered the issues associated with valuing the discovery and use of depletion of exhaustible natural resources in measures of national income and wealth.

In the private sector, financial accounting and reporting for petroleum- and mineral- producing companies has been debated for many years in the United States by the accounting profession, regulatory agencies, industry groups, and the companies themselves. The U.S. Securities and Exchange Commission (SEC) and Financial Accounting Standards Board (FASB) have given extensive consideration to the appropriate accounting and financial reporting for publicly traded corporations involved in extractive activities. The debate was initially focussed on the two widely different methods of reserve valuation used by companies, the full cost method and the successful efforts method. (FASB 1977) Each was based upon the costs of exploration and development actually incurred, but without reflecting the market value of reserves or annual changes in reserves to which the company has rights of ownership. Believing with ample justification that neither method provided sufficient information to

stockholders, the SEC proposed a new method of reserve recognition accounting (SEC 1978) that valued proven oil and gas reserves according to the discounted present value of the stream of future income at current prices and costs. Following further debate on the issue, however, SEC abandoned this method of accounting since the burden of producing the information was considered to outweigh its usefulness to users of financial statements. (SEC 1981)

The FASB recently considered means by which companies could provide information about future cash flows from oil and gas reserves as supplemental information, outside the financial statements. (FASB 1982) They evaluated the alternatives of fair market value, discounted future net cash flows, and a "standardized measure" of discounted net cash flows. Fair market value was rejected on the basis that relatively few exchanges of oil and gas mineral interests take place, and the geological characteristics of each property are unique and thus incomparable. The use of discounted future net cash flows, based on estimated future prices and costs, production timing, and an enterprise-specific discount rate as a surrogate for fair market value, was also rejected since such subjectively based calculations could not provide sufficiently comparable and verifiable information for financial reporting. The Board settled on a standardized measure of discounted net cash flows. Future net cash flows result from subtracting future development and production costs (and tax expenses) from future cash inflows relating to proved oil and gas reserves, using prices and unit costs as of the end of the reporting year. A discount rate of 10 percent is specified. The FASB points out that the standardized measure cannot be considered an estimate of fair market value but should reflect some of the key variables that affect fair market value—such as changes in reserve quantities, selling prices, production rates, and tax rates. Thus, the private accounting profession, after lengthy consideration, has adopted a valuation method based on the net price approach.

E. Integrating Natural Resources into the National Accounts

Income accounts for natural resources can be developed directly from accounts expressed in physical units by assigning appropriate monetary values to stock levels and changes. Net changes in the value of stocks are attributed to current year additions (discoveries, net revisions, extensions, growth or reproduction) less deductions (degradation, deforestation, or depletion) plus any price changes of the resource during the year, as illustrated in Table I.4. This framework is applicable with suitable specification to a wide variety of resources.

If the primary objective were only the national balance sheet presentation of natural resource accounts, the example shown in Table I.4 would be relatively straightforward. The net value of the resource increased by $155 ($255–$100) during the year and net national wealth also increased by $155.

To adjust gross national product to a net basis, economists have a number of options. If the only desired adjustment to income were to reflect resource *depletion*, then net national product would be reduced by $32, using the average valuation rate of $1.60 per barrel. If *all* the physical changes in the resource base were netted, yielding a decrease of 15 physical units, NNP would be reduced by $24, at the same average valuation. However, if the gain in value of the opening stock due to price changes were also treated as current income, NNP would be increased by $155, the difference between the two balance sheets.

In other words, alternative adjustments are possible, depending on the objective. Treating unrealized capital gains and losses due to price changes as income is consistent with the definition of income given above, since the capital gain during the year could be consumed without reducing future potential consumption below what it would have been at the original price level. However, accounting conventions

Table I.4. Example of Resource Inclusive National Acounting System

	Physical Units	Unit Value	Value ($)	Basis of Calculation
Opening Stock	100	1.00	100	
Additions:				
Discoveries	20	1.60	32	
Revisions (Net)	(30)	1.60	(48)	
Extensions	15	1.60	24	
Growth*	0	1.60	0	
Reproduction*	0	1.60	0	
Reductions:				
Production	(20)	1.60	(32)	
Deforestation*	0	1.60	0	
Degradation*	0	1.60	0	
Net Change	(15)	1.60	(24)	
Revaluations:				
Opening Stock	—	—	200	100 × (3.00−1.00)
Transactions	—	—	(21)	15 × (3.00−1.60)
Closing Stock	85	3.00	255	

Note: Example of a natural resource account as it might appear in national economic accounts. The resource unit value (based on international commodity prices less factor costs incurred in extraction or production) is assumed to be $1.00 at the beginning of the year, $3.00 at the end of the year, and to average $1.60 during the year.

The total increase in the value of the resource over the period shown is equal to $155 ($255−$100). The methodology recommended in this paper would result in a downward adjustment to net national product of ($24). The remaining net change in total value of $179 ($155 + $24 or $200 − $21) would be recorded in a revaluation reserve and have no impact on income of the current period.

Items marked * are specific to forest resources; all other categories are applicable to subsoil minerals, e.g., oil and gas.

now in use for physical plant and equipment value assets at "book value" rather than replacement cost: they *do not* reflect changes in asset values in current income accounts.

The United Nations (1977, 1980) has suggested that all changes in the value of natural resource stocks due to new finds, price changes, and depletion should be excluded from the income accounts. At the opposite extreme, Eisner (1980, 1985) has argued that capital revaluations in excess of those generated by general price rises should be included in measures of income and capital accumulation.

Accordingly, the money value of all capital gains in excess of those necessary to keep the real value of capital intact should be included in income. Eisner (1980) extends this argument to propose the inclusion of capital gains arising from the discovery of new resources in income, and the exclusion of resource depletion from income.

International resource commodity prices are subject to dramatic fluctuations over comparatively short time periods because price elasticities of demand and supply are often small in the short run. Including unrealized capital gains from natural resource price changes in current income could lead to significant swings in income between successive periods in resource-dependent countries. However, natural resource price swings (such as the energy price shocks) also markedly affect the value of plant, equipment, and real estate that are specific to those natural resource sectors.

The procedures illustrated here, which incorporate the net price method (Landefeld & Hines 1982, 1985), include only the value of *physical* resource stock changes in national income. This procedure is consistent with current asset-accounting practices. In addition, it is more readily implemented since, for most natural resources, information on stock changes due to extraction or discovery is more accurate than information on the size and composition of the total stock. At the end of each accounting period, the physical units comprising the opening balance of natural resource stocks have been revalued at the net price prevailing at the end of the period. The revaluation adjustment (which, in the example shown in Table I.4, equals $200) has been recorded in a revaluation reserve and therefore has no effect on the current period's income. The net physical change (15 units) is valued at the average net price prevailing during the period and is used to adjust NPP downwards by $24. The remaining revaluation adjustment, which arises from the difference between average and closing prices applied to the net physical change in resource stocks ($21) is recorded in the revaluation reserve as an unrealized capital gain, with no impact on income.

If national accounts are adjusted to show income at constant prices, thereby eliminating the effects of general inflation, the adjustment to income ($24) should be deflated by an appropriate price index. As a result, only real wealth increases or decreases will be reflected in measured national income.

Preliminary resource accounts in physical and value terms for tropical timber, petroleum, and soil resources in Indonesia from 1970 to 1984 illustrate this methodology. The net changes in resource values from physical sources (for example, excluding price revaluations) implied by these tables were reflected in the summary tables and figures presented earlier to illustrate the usefulness of such calculations in macroeconomic evaluation. The resource accounts are preliminary, in that they have not been endorsed by official Indonesian statistical or economic agencies, but represent a non-governmental research effort that drew on published and some unpublished statistical sources. Efforts are currently under way in cooperation with the Ministry for Environment and Population and a consortium of universities in Indonesia to revise these accounts and to extend the methodology to other resource sectors.

Details of the estimates are provided in Part II of this report.

Note

1. It may seem anomalous that in 1971 and 1973 depreciation was a negative number, that is, net capital consumption was *added* to gross domestic product and investment. The reason for this is that the value of additions to petroleum reserves in these years were considerably larger than all categories of depletion combined, leading to "negative" depreciation.

   One way of resolving this apparent anomaly would be to account separately for additions and subtractions from natural resource assets. Real capital gains (as distinct from those resulting from price changes) can be accounted for as gross income and gross capital formation. This is consistent with our earlier definition of income, because additions to resources during the current year augment the amount that *could* be consumed currently without reducing potential consumption in future years. This is obvious in the case of forest growth, but less obvious for mineral discoveries, since current discoveries may leave less to be discovered later on. However, insofar as additions to mineral reserves reflect advances in the technology of exploration or extraction, the total potential resource base will have expanded.

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II. The Indonesian Resource Accounts

A. Timber Resource Accounts, 1970–1984

Preliminary accounts in physical and value terms for Indonesia's timber resources were estimated using the methodology explained in Part I. The accounts do not represent the full value of Indonesia's *forest* resources, which yield such important non-timber commodities as rattan, oils, resins, foodstuffs, and pharmaceutical products, and which also provide important ecological services. In principle, the values of non-timber forest commodities enter into gross domestic product, though in practice they are greatly underestimated. Exports alone of non-timber products reached U.S. $120 million in 1982. Full accounting for deforestation would include the present value of foregone future income from these non-timber forest products and services. Indonesian forests are mostly equatorial rainforests and tropical semi-deciduous *(dipterocarp* and mixed *dipterocarp)* forests, but also include swamp and mangrove forests along the coasts of Sumatra and Kalimantan and small areas of peat forests. Before World War II, timber production was concentrated on Javanese teak plantations, but after 1967 timber extraction increased rapidly from extensive primary lowland rainforests in Kalimantan, Sumatra, Sulewesi, and Irian Jaya. Indonesia joined Malaysia and the Philippines as Southeast Asia's leading log exporters, accounting together for 80 percent of world tropical hardwood exports. Indonesia's share of world exports rose from 1 percent in 1964–66 to a peak of 31 percent in 1979–81, when timber was the country's second largest export commodity in terms of gross receipts. After 1980, government restrictions to promote domestic processing reduced log exports, and replaced them with increasing volumes of lumber and plywood.

All Indonesian natural forests are state-owned and administered by the Ministry (formerly Directorate General) of Forestry. While the basic forestry law acknowledges the traditional rights of indigenous communities, in practice these *adat* rights are honored more in the breach than in the observance. On the Outer Islands, management and harvesting of most tracts are contracted to private companies, subject to regulation under the Basic Forestry Act of 1967, which prescribes good timbering and ecological practices. Up till now, the forestry agencies have been unable to enforce these prescriptions effectively. Virtually all concessionaires have nominally adopted the Indonesian Selective Cutting System, which specifies minimum tree sizes harvested and numbers, spacing, and size classes of residual trees per hectare, along with the allowable cut, but few actually follow it faithfully.[1] Forest management and policy in Indonesia have posed difficult development problems.[2]

1. The Physical Accounts

While stock estimates at different points in time provide consistency checks, an estimate of the physical growing timber stock was essential for only one benchmark year during the period. Stocks for the remaining years were computed from the respective annual net additions and reductions, for which estimates (of varying quality) were available.

Estimates of the total forest land area vary considerably among sources. An estimate for 1985 by the Directorate General of Forestry, presented in Table II.1, puts the total forest area at 143 million hectares, nearly three-quarters of Indonesia's total land area. However, this estimate included land within classified forest boundaries designated as "conversion forest," much of which had already been deforested. A 1981 FAO study *(Table II.2)* gives a figure of 158.2 million hectares, of which 113.9 million are closed forests.[3] A more recent assessment by the Land Resources Development Center and the Ministry of Transmigration, using aerial photographs dating mostly from the early 1980s, roughly agree with FAO totals for the islands already covered. A regional breakdown shows that only 1 percent of forest land is in the densely populated Inner Islands of Java and Bali, while Sumatra, Kalimantan, Irian Jaya, and Sulewesi account for 90 percent.

a. *Growing Stock*

Estimates of the total growing stock are derived from concession surveys carried out in the 1970s and from more recent provincial surveys. Although such inventories, carried out at

Table II.1. Indonesian Forest Resources: Department of Forestry Classification 1985 (million hectares)

1. **Total Land Area**		**193.6**
2. **Total Forest Area** *		**143.0**
3. **Elements of Forest Area** *		
a. Protection Forest		30.3
b. Nature Conservation and Tourism Forest		19.0
c. Production Forest (available for commercial harvesting)		64.0
i) Limited Production		(30)
ii) Permanent Production		(34)
d. Production Forest that may be converted to non-forest purposes		30.0
4. **Area Awarded to Concessionaires or in Process of Award**		**65.4**
a. Area under Concession (holders of Forest Exploitation rights)		52.2
b. Areas under Forestry Agreements (last step prior to award of rights)		13.2
* Total Rain Forest Area	82.2	
Total Swamp Forest Area	12.0	
Total Secondary Forest Area	14.6	
Other Forest Area	34.2	

Sources: Forest Area: 1985 Departamen Kehutanan, Draft Long-Term Forest Plan (Jakarta, January 1985, p. 17). Concession Areas: P.T. Data Consult, 1983.

Table II.2. Indonesian Forest Resources FAO Classification, 1980 and 1985 (million hectares)

	1980	1985	Indonesia as % of all Southeast Asia, 1985
Total Area, Natural Woody Vegetation	**158.2**	**157.1**	n.a.
A. **Closed Forests**[a]	**113.9**	**110.9**	61.8
1. Productive Forests[b]	73.7	67.7	58.5
a. Undisturbed Forest	38.9	33.0	56.6
b. Logged Forest	34.8	34.7	68.6
2. Unproductive Forest[c]	40.2	43.2	19.7
a. For Physical Reasons	34.7	n.a.	n.a.
b. For Statutory Reasons (parks, reserves)	5.4	n.a.	n.a.
B. **Open Forest**[d]	**3.0**	**2.8**	n.a.
C. **Fallows**[e]	**17.4**	**19.5**	n.a.
D. **Shrub Formations**	**23.9**	**23.9**	n.a.

a. Closed forests are those that have not been recently cleared for shifting cultivation or heavily exploited. In closed forest formations, tree crowns, underlayer and undergrowth combine to close off most of the ground from light so that continuous grass cover cannot develop.
b. Productive forests are those from which it is both physically and legally possible to produce wood for industry.
c. In unproductive forests, timber is not exploited for statutory reasons, or because harvesting is infeasible due to difficult terrain or stand conditions.
d. Open forest formations are marked by continuous grass cover on the ground.
e. Fallow refers to secondary vegetation following the clearing of forests.

Source: Food and Agriculture Organization of the United Nations, Forest Resources of Tropical Asia, Rome, FAO, Tropical Forest Assessment, 1981, p. 40, pp. 211-237, 277-313, 391-416.

different times and by different methods, aren't fully comparable, they have been made as consistent as possible through cross-checking and adjustment. The measure of stocking volume used is *'volume over bark'* (VOB): gross volume in m^3 per hectare over bark of free bole (from stump or buttresses to crown point of first main branch) of all living trees more than 10 centimeters in diameter at breast height.

Regional VOB values were obtained in the FAO study by comparing results from sample areas with more complete data from the Malaysian

national inventory.[4] Stocking rate estimates of 323 m^3/ha for virgin forests (49 percent), 204 m^3/ha for logged forests (17 percent), and 198 m^3/ha for unproductive forests (34 percent) were applied to Sumatra and Kalimantan. These estimates were reduced by 15 percent for Sulawesi, Maluku, and Nusantenggara, and by 25 percent for Irian Jaya. Estimated stocking rates are then applied to data on forested areas by island and category. The total growing stock in natural forests at the end of 1980 comes to 24,248 million cubic meters, an average stocking rate of 212.9 m^3 per hectare.

A 1980 closing stock estimate of 24,248 million m^3, reflecting the VOB measure, has been included in the timber resource accounts for natural forest. This includes 10,311 million m^3 of virgin forests, 6,911 million m^3 of logged forests, and 7,026 million m^3 of unproductive forests.

Another measure, *'volume actually commercialized'* (VAC), describes the "volume under bark of logs commercially exploitable actually extracted from the forest," and it has been estimated only for virgin productive forests where the volume extracted per hectare is generally well-known. The average volume of commercial timber remaining in logged-over forests is difficult to estimate. VAC has been estimated at 20 m^3/ha for Irian Jaya, 25 m^3/ha for Sulewesi, and 45 m^3/ha for Sumatra and Kalimantan. Compared to VAC measures in Malaysia and the Philippines, these rates are low, reflecting the more selective logging practices in Indonesian forests. The value actually commercialized depends in part on the system of forest taxes and royalties, which influences the degree to which concessionaires limit harvesting to the most valuable trees. The average annual commercial production during the years 1974–80 was actually 40 m^3/ha.

Government-sponsored plantation programs implemented by the Directorate for Reforestation, the parastatal timber company, and timber concessionaires now cover significant areas in most provinces. Plantations established by concessionaires in response to financial incentives are largely pine, and many are of questionable commercial value. The Directorate's plantations include fodder and fruit trees and have had a lower survival rate.

Estimates of the area and volume of forest plantations are uncertain, partly due to unreliably reported survival rates on planted areas. The United Nations Food and Agriculture Organization estimated that "successfully established and reasonably stocked" plantations had a total estimated area of 1,918,000 ha (1,446,000 industrial and 472,000 non-industrial) in 1980.[5] The stocking of plantations has been assumed to be at an average rate of 100 m^3/ha, yielding 192 million m^3 of growing stock at the end of 1980. This figure has been added to the natural forest stocks to derive the 1980 resource account closing balance of 24,440 million m^3 of standing timber.

b. *Growth and Reproduction*

An average annual increment in volume of all trees in the forest can be expected only from disturbed or managed forests since undisturbed forests have reached their climax equilibrium. No detailed information on growth rates of disturbed natural forests is available for Indonesia, but estimates for *dipterocarp* forests elsewhere in the region suggest annual growth in commercial species between 1 and 2 m^3/ha/year.[6] Commercial growth in the forests of Sulewesi and Irian Jaya, where stocking rates are relatively low, must be lower. Another FAO study indicates an annual net increment of 1.3 m^3/ha.[7] The 34.6 million ha of logged forests were estimated to carry a timber volume of 6,911 million m^3 at an average stocking level of 200 m^3/ha. This study assumes a growth rate of 1.5 m^3/ha for these forests, yielding an annual increase in volume of 51.9 million m^3, which corresponds to an annual biomass increment of 0.75 percent. This figure has been used in the timber resource accounts.

An estimate of annual increase in plantation timber volume can be developed from the

plantation species' growth rates (expressed as the mean annual increment at rotation age) and the distribution of industrial plantation areas by species reported by the FAO, as follows:[8]

Species	Area of Established Industrial Plantation (1980) (thousand ha)	Mean Annual Increment (M.A.I.) (m^3/ha/year)
Tectona grandis	861	8.5
Pinus merkusii	390	18.0
Others	195	n.a.
	1,446	11.5*

*Approximate weighted average M.A.I. based on *Tectona grandis* and *Pinus merkusii* only.

FAO (1981) estimates that 542,000 ha of the industrial plantation area of 1,446,000 ha (i.e., 37.5 percent) was established during 1976–80. The physical stock of industrial plantations at the end of 1976 can therefore be estimated as the remaining 904,000 ha. Assuming the same rate of increase in non-industrial plantations, the 1976 total plantation physical stock can be estimated as 1,199,000 ha (62.5 percent of 1,918,000). The growth in plantation area for the remaining years during the study period (1970–82) has been estimated by assuming a linear growth rate, and the volume change by applying the annual growth rate of 11.5 m^3/ha/year calculated above.

c. *Harvesting*

Figures for the total log harvest are reported by the Directorate General of Forestry in the annual report on Indonesian forestry statistics. They may be underestimates, due in part to considerable log smuggling and underinvoicing of exports to avoid export restrictions, taxes, and royalties. The recorded harvest rises to a peak of more than 25 million m^3 in 1979 and 1980, then declines due to export restrictions and domestic processing requirements. Alternative World Bank estimates, not incorporated here, place the annual harvest in the 1980s at about 25 million m^3 per year. The log output is composed of *meranti, kerning, ramin, teak,* and a few other species, extracted predominantly from Kalimantan and Sumatra during the period reviewed. These harvest figures are entered directly into the physical accounts.

d. *Deforestation and Degradation*

Deforestation denotes transfers of forest lands to other uses, including shifting and permanent cultivation, reservoirs, and other infrastructure. The area deforested annually in Indonesia is the highest in the region, due mainly to agricultural conversion. The national transmigration program settled 50,000 families from the Inner Islands on Sumatra and Kalimantan between 1974 and 1978, each on 5 hectares of land, and moved about 300,000 households between 1979 and 1984. Between 1980 and 1986, the government cleared about 800,000 hectares of land for transmigrants, of which perhaps 600,000 was logged or secondary forest. In addition, about 330,000 hectares of land still forested were allocated to transmigrants and will probably have been cleared by the end of the decade. (World Bank, 1987) Land clearance by spontaneous migrants is thought to be of the same order of magnitude as clearance by sponsored transmigrants. Other planned deforestation, largely in designated "conversion forests" for estate crops and other development projects, is estimated at about 100,000 hectares per year in the 1980s. (World Bank, 1987)

An estimated 10 to 12 million people on the Outer Islands subsist by shifting cultivation, largely on Kalimantan, Sumatra, Sulewesi, and Malaku. Most of the area affected has been reduced to poor secondary forest and scrub or converted to grassland. An estimated 20 percent of the total land area in Kalimantan has been affected by shifting cultivation, and 14 percent in Irian Jaya. Expansion of shifting cultivation is most rapid in logged productive

forest and slowest in unproductive closed forest, due to differences in accessibility.

Taking into account all causes, an FAO study estimated that 9.27 million hectares were deforested between 1950 and 1977, at annual rates of 550,000 ha/year during the 1970s and rates of 600,000 in 1981 and 1982.[9] Estimates for the mid-1980s compiled by a recent World Bank assessment suggest a higher figure of over 700,000 hectares annually, but the more conservative FAO figure is used in the timber resource accounts. If a stocking rate of 200 m^3/ha (the average stocking rate for secondary forests) is used, annual volume losses of 110 and 120 million m^3 are implied for the 1970s and 1980s respectively.

Degradation refers to forest deterioration due to such natural disasters as fires, earthquakes, and pests, and due to destructive exploitation of forest resources in logging operations, grazing, and fuelwood collection. Intensive logging in Indonesia has been estimated to damage up to 40 percent of the residual trees. Logging damage has been estimated through a residual balance equation that equates the difference between stocking rates on virgin and logged forest to harvest removals and logging damage. The resulting estimate of 79 m^3 per hectare is consistent with the figure of 40 percent of volume remaining after harvest. This calculation yields a ratio of 1.98 m^3 damaged for every cubic meter harvested, and this ratio is assumed in the accounts to hold in each year.

Fires are also an important factor. The El Niño perturbation in 1982–1983 provoked severe drought, and led to disastrous forest fires in Kalimantan and neighboring Sabah in 1983–84, especially in logged-over areas littered with dead trees and branches. The damaged area in Kalimantan has been estimated at 800,000 ha of primary lowland rainforest, 550,000 ha of peat forest, and 1,200,000 ha of selectively logged primary forest. In addition, 750,000 ha of swidden area was affected, bringing the total to 3,700,000 ha. (Prance 1986) Sampled mortality rates in the burned area averaged 60 percent for small trees and 25 percent for those greater than 30 cm./dbh. Making the most conservative assumption that only 25 percent of timber resources in the areas burned were lost, the fire still cost over U.S. $3.5 billion in timber assets.

Based on results of a consultant study, fires in the preceding five years consumed an average of 60,000 hectares, mostly in secondary forests. Taking this rate to represent normal fire losses in other years adds 14 million m^3 in annual timber losses to the accounts.

e. *Summary of Physical Accounts*

These categories constitute the principal sources of increase and decrease in Indonesia's forest resources. Together with the 1980 benchmark estimates of growing stock, they permit construction of the physical accounts presented in Table II.3 for the years 1970 to 1984. They imply a cumulative net decrease in growing stock of 1,866 million m^3, about 7.2 percent of the total standing timber resource in 1970. Losses due to deforestation and degradation appear to have been several times greater than those due directly to timber harvests, but it must be remembered that logging roads increased access for settlers and accelerated forest conversion. Throughout the period, direct harvest volume appears to be less than total annual growth, but when associated logging damages are also considered timber operations have resulted in losses that exceeded growth. Since the growth of commercial species is estimated to be less than 1 m^3 per hectare, selective cutting has unambiguously reduced the forest in value.

2. The Value Accounts

a. *The Measure of Economic Rent*

The relevant measure of economic value to be applied to these changes in the physical resource base is the value of the standing timber prior to any value added by processing. Timber's economic rent corresponds to its

Table II.3. Forestry Accounts 1970–1984

	1970	1971	1972	1973	1974
PHYSICAL UNITS (million cubic meters)					
Opening Stock	25,773.1	25,672.5	25,562.7	25,445.8	25,303.1
Additions					
Growth	51.9	51.9	51.9	51.9	51.9
Reforestation	1.3	3.4	5.5	7.6	9.7
Reductions					
Harvesting	10.0	13.8	16.9	26.3	23.3
Deforestation	110.0	110.0	110.0	110.0	110.0
Logging Damage	19.8	27.3	33.4	51.9	46.0
Fire Damage	14.0	14.0	14.0	14.0	14.0
Net Change	−100.6	−109.8	−116.9	−142.7	−131.7
Closing Stock	25,672.5	25,562.7	25,445.8	25,303.1	25,171.4
UNIT VALUES (US$/m³)					
FOB Export Price	10.90	15.10	17.10	29.30	41.60
Costs	4.90	6.80	7.90	13.18	18.72
Primary Rent	6.00	8.30	9.20	16.12	22.88
Secondary Rent	3.00	4.15	4.60	8.06	11.44
MONETARY ACOUNTS (US$ millions)					
Opening Stock	—	108,335.7	149,346.6	164,910.4	287,546.3
Additions					
Growth	155.7	215.4	238.7	418.3	593.7
Reforestation	0	0	0	0	0
Reductions					
Harvesting	60.0	114.5	155.5	424.0	533.1
Deforestation	330.0	456.5	506.0	886.6	1,258.4
Logging Damage	59.4	113.3	153.6	418.3	526.2
Fire Damage	42.0	58.1	64.4	112.8	160.2
Net Change	−335.7	−527.0	−640.8	−1,423.4	−1,884.2
Revaluation[a]	—	41,537.9	16,204.5	124,059.3	120,609.6
Closing Stock	108,335.7	149,346.6	164,910.4	287,546.3	406,271.7

a. The Revaluation category accounts for changes in the value of the overall stock which are due only to differences in the rental rates.

Table II.3. (cont.) Indonesian Forestry Accounts

PHYSICAL ACCOUNTS (million cubic meters)	1975	1976	1977	1978	1979
Opening Stock	25,171.5	25,062.6	27,940.6	24,818.4	24,692.3
Additions					
Growth	51.9	51.9	51.9	51.9	51.9
Reforestation	11.8	13.8	15.9	18.0	20.1
Reductions					
Harvesting	16.3	21.4	22.2	24.2	25.3
Deforestation	110.0	110.0	110.0	110.0	110.0
Logging Damage	32.2	42.3	43.8	47.8	50.0
Fire Damage	14.0	14.0	14.0	14.0	14.0
Net Change	−108.8	−122.0	−122.2	−126.1	−127.3
Closing Stock	25,062.6	24,940.6	24,818.4	24,692.2	24,565.0
UNIT VALUES (US$/m³)					
FOB Export Price	26.40	44.70	47.50	46.70	85.21
Costs	11.88	20.12	21.38	21.05	29.84
Primary Rent	14.52	24.58	26.12	25.65	55.37
Secondary Rent	7.26	12.29	13.06	12.82	27.68
MONETARY ACCOUNTS (US$ millions)					
Opening Stock	406,271.7	256,848.6	432,898.5	457,956.5	447,586.3
Additions					
Growth	376.8	637.9	677.8	665.6	1,436.9
Reforestation	0	0	0	0	0
Reductions					
Harvesting	236.7	526.0	579.9	620.7	1,400.9
Deforestation	798.6	1,351.9	1,436.6	1,410.8	3,045.3
Logging Damage	233.8	519.9	572.0	613.0	1,384.3
Fire Damage	101.6	172.1	182.8	179.6	387.6
Net Change	−993.9	−1,932.0	−2,093.5	−2,158.5	−4,781.3
Revaluation[a]	148,429.2	177,981.9	27,151.5	−8,211.7	518,669.0
Closing Stock	256,848.6	432,898.5	457,956.5	447,586.3	961,474.0

Table II.3. (cont.) Indonesian Forestry Accounts

PHYSICAL ACCOUNTS (million cubic meters)	1980	1981	1982	1983	1984
Opening Stock	24,565.0	24,440.0	24,334.5	24,238.8	24,001.3
Additions					
Growth	51.9	51.9	51.9	51.9	51.9
Reforestation	22.1	24.2	26.3	29.6	35.3
Reductions					
Harvesting	25.2	16.0	13.4	15.2	16.0
Deforestation	110.0	120.0	120.0	120.0	120.0
Logging Damage	49.8	31.6	26.5	30.0	31.6
Fire Damage	14.0	14.0	14.0	153.8[b]	14.0
Net Change	−125.0	−105.5	−95.7	−237.5	−94.4
Closing Stock	24,440.0	24,334.5	24,238.8	24,001.3	23,906.9
UNIT VALUES (US$/m³)					
FOB Export Price	106.93	95.84	100.59	78.75	93.15
Costs	34.24	37.93	41.00	43.31	51.23
Primary Rent	72.69	57.91	59.59	35.44	41.92
Secondary Rent	36.34	28.95	29.79	17.72	20.96
MONETARY ACCOUNTS (US$ millions)					
Opening Stock	961,474.0	1,256,046.9	996,266.8	1,020,959.6	601,049.0
Additions					
Growth	1,886.3	1,502.8	1,546.4	919.7	1,087.8
Reforestation	0	0	0	0	0
Reductions					
Harvesting	1,831.8	926.6	798.5	538.7	670.7
Deforestation	3,998.0	3,474.6	3,575.4	2,126.4	2,515.2
Logging Damage	1,810.0	915.0	789.6	531.6	662.3
Fire Damage	508.8	405.4	417.1	3,870.9	293.4
Net Change	−6,262.3	−4,218.8	−4,034.2	−6,148.3	−3,053.8
Revaluation[a]	300,835.2	−255,561.3	28,727.0	−413,762.7	109,775.0
Closing Stock	1,256,046.9	996,266.8	1,020,959.6	601,049.0	707,770.2

b. The value for fire damage in 1983 is made up entirely of estimates for the Kalimantan fire, assuming mortality rates of 25%.

"stumpage value," the market value of standing trees. With full knowledge of the resource and competitive bidding, this is the maximum amount potential concessionaires would pay for harvesting rights. Since the Indonesian government has not administered its forest resource so as to recover a large fraction of these rents from concessionaires, stumpage value must be estimated by the net price method described earlier—by subtracting costs of extraction and transportation to the port from the export value of the timber.

The export value has been measured directly by the free on board (f.o.b.) export unit value, which is simply the ratio between gross export receipts and the volume of log exports. This figure is a conservative estimate of timber value because log exports were considerably underinvoiced throughout the period to avoid export taxes. This value is applied to timber extracted for domestic processing as well since it is the relevant measure of economic opportunity cost.

Published information on extraction and transportation costs were sparse. Average production cost estimates were available for 1973 and for 1980.[10] Deducting these total cost estimates from the respective weighted average f.o.b. price per m^3 of exported logs (the 'export unit value') yielded estimates of average stumpage values or rents per m^3 for those two years for logs actually harvested. In 1973, this method produced a rent figure of $\$16.15/m^3$, based on an f.o.b. unit export value of $30.34 less a production cost estimate of $14.19 (for E. Kalimantan). These calculations are given in Table II.3. For both benchmark years, unit rents equal 53–55 percent of f.o.b. export unit values. Rents for the period 1970–78 and 1983–84 have been estimated by assuming that the same relation held for other years in those periods. Thus, unit rents are assumed to be 55 percent of f.o.b. value in each year. The 1979–82 f.o.b. values, production costs, and rents have been taken directly from a detailed study of rents and rent capture covering those years.[11]

Domestic processing of roundlogs into sawnwood and plywood for export dissipated *potential rent* from the roundlog harvest during 1979–83 because restrictions on log exports protected inefficiencies in Indonesia's wood-processing industries. The potential rent obtainable from roundwood at the time of harvesting, equivalent to that on log exports, is therefore a more valid economic measure of depletion costs for the timber resource than the rents actually earned.

The rental value of harvested timber and mature virgin forest stands from which future commercial extraction can be anticipated cannot be applied without modification to the remaining elements of the timber accounts—reforestation/afforestation, deforestation, and degradation—which refer only to secondary forests. The value of each cubic meter of timber initially harvested from an area of virgin forest may be anticipated to exceed that of the remaining timber and of subsequent harvests from the logged-over forest. This implies that lower rent values should be assigned to changes in timber resource levels that arise from growth, deforestation, or degradation in secondary forests.

However, subsequent harvests will typically not exhaust the stumpage value in secondary forests, in part because trees worth less than the royalties and taxes that would be due on them will never be harvested. For example, if such charges total $20 per cubic meter, rational concessionaires will never deliberately harvest trees with a lower stumpage value, even though those trees are not economically worthless.

For commercial species, one indicator of stumpage values in secondary forests can be derived from the rotation period between successive harvests, which is set to allow stands to regenerate. In the Indonesian selective cutting system, the prescribed period between harvests is thirty-five years. Immediately after logging, the present value method implies that the resource rent on the residual stand is the

discounted present value of the income from the next harvest thirty-five years in the future. Since secondary forests contain stands last harvested varying numbers of years ago (from one to thirty-five), an average of such present values yields an estimate of the resource rents for commercial species in secondary forests. This estimate must then be adjusted for the distribution of trees between commercial and non-commercial species. Applying this reasoning to the Indonesian case in the absence of extensive data, results in an estimate of an average resource rent in secondary forests equal to approximately one-half that of the timber harvest. This estimate has been applied to the physical accounts for stocks, regeneration, deforestation, and degradation of secondary forests.

The value of changes in plantation timber levels (reforestation/afforestation and harvesting) has been estimated as zero because plantation investments in Indonesia have not been shown to yield more than a normal rate of return on investment. In fact, a normal rate of return may be a generous estimate of their profitability to date. Further, the proportion of the total harvest originating from plantations is small and has been provisionally estimated as zero. In summary, physical stocks have been valued as follows:

Virgin forests	Primary rent (PR)
Logged forests	Secondary rent (PR × 0.50)
Protection forests	Secondary rent (PR × 0.50)
Plantations	Zero

B. Indonesian Petroleum Resource Accounts, 1970–1984

Indonesia's geological situation at the intersection of several continental plates may account for the vast reserves of oil and natural gas in the region. In 1849, there were reports of oil seepages in West Java, but it wasn't until 1871 that exploratory wells were drilled and 1885 that commercial production began. Between 1880 and 1930, seven of the fourteen major basins were discovered, and by 1965 three more large fields were found, including the Minas field in Central Sumatra—the region's largest.

After 1966, technological developments and political stabilization encouraged exploitation of offshore oil resources. Rising production and world oil prices in the early 1970s led to boom conditions, which were dampened by the revelation in 1974 of serious financial mismanagement by the state oil company, PERTAMINA. After several years of reduced exploration while foreign oil company contracts were renegotiated and Indonesia's oil-related businesses were reorganized, development resumed in 1978 and accelerated during the second oil boom. After 1982, falling oil prices led to a downward trend in investment.

Most experts believe that all major fields have been discovered and further exploration will yield no great surprises. Future production prospects are apparently mediocre, given that proven reserves of 9.7 billion barrels in 1984 were enough for only another 18 years at the 1984 production rate of about 500 million barrels per year. Production is already declining in most major oilfields, and estimates of undiscovered reserves range from 10 to 40 billion barrels.[12] Significant natural gas production began only in the 1970s, however, after the Minas field was found, and production since then has grown sharply. Indonesia's vast gas resources are found in more remote regions of the archipelago and remain largely unmapped. Current proven reserves exceed 12.7 billion barrels of oil equivalent (BOE) and possible reserves are estimated at 45 billion barrels. The huge Arun gas field alone has estimated reserves of 2.7 billion BOE, and the recently discovered Natuna field may have twice that much.[13] (Resource accounts for natural gas are not included in this report, due to paucity of data on output, reserves, and production costs, but will be constructed for future analysis.)

Oil has accounted for more than 50 percent of export earnings and government revenues

since 1967, and it has financed rapid growth in investment and consumption expenditures. In the 1980s, falling oil prices and growing domestic consumption sharply reduced export receipts. The Indonesian government has responded by devaluing the currency to promote other exports and by reducing domestic petroleum subsidies to restrain domestic consumption and improve government finances.

PERTAMINA remains responsible for oil and gas development, but with powers more limited than they were before 1975. Over 90 percent of exploration and production is contracted to foreign oil companies. Early contracts exchanged exploration and production concessions for royalty payments. In the early 1960s, new "contract of work" agreements were introduced, under which the government holds title to the oil and collects a share of profits rather than royalties. Most current production is under production-sharing contracts that require the contractor to pay a bonus when the agreement is signed, spend a specific amount on exploration within a stipulated period, supply 25 percent of output to PERTAMINA at cost plus $0.20 (formerly $0.30) per barrel, and pay an additional amount such that the net worth of the oil is split according to negotiated ratios between PERTAMINA and the oil company. PERTAMINA's share ranges from 65 to 88 percent.

1. The Physical Accounts

Petroleum resources are divided into identified and undiscovered reserves. Identified reserves are subdivided into *proven reserves*, those that can be recovered under current economic and technical conditions, and *probable reserves*, those estimated to exist on the basis of engineering and geological data that are obtained with current operating practices. Undiscovered reserves are surmised to exist on the basis of broad geologic theory and experience. By definition, since only proven reserves have a positive rental value (their net price exceeds their estimated recovery cost), only proven reserves enter the resource accounts.

Additions to reserves in the physical accounts consist of discoveries (reserves found in new reservoirs by exploratory drilling) and upward adjustments of reserve estimates in existing reservoirs because of new information or changed technological and economic conditions. *Subtractions* from reserves are attributable to extractions, downward adjustments to proven reserves, and other depletion losses, such as oil spills. *(See Table II.4.)*

Within this framework, data on flow items are more reliable than stock estimates because Indonesia's exploration and extraction is closely monitored by other members of OPEC and by the international oil community. Data on Indonesia's proven reserves is sketchy and of limited reliability, in part because such information is treated as sensitive by the government. Reported revisions to reserves seem also to be influenced by companies' strategic interests. In most years, they closely parallel reported production to keep total reserves stable. While significant discoveries were reported during the period, upward and downward revisions of reserve figures were negligible. This differs significantly from typical experience in other oil-producing regions, where, as discussed earlier, upward revisions add substantially to initially reported reserve figures. Moreover, in years of sharp oil price hikes, which ought to have made more oil economically recoverable, reported reserves did not increase. However, in 1974, in the wake of changes in U.S. tax law and Indonesian contracts favorable to exploration activities, reported reserves increased sharply.

For these reasons, the net changes in resources that correspond to resource depletion within the national income accounting framework are more useful than the valuation and revaluation of total resource stocks. Even data for the flow items are not without problems. Production data are probably understated, since Indonesia, as a member of the OPEC cartel, has been obliged to limit production below the amount it would wish to sell. Undeclared production is primarily in the form of condensate

Table II.4. Petroleum Accounts 1970–1984

PHYSICAL ACCOUNTS (million barrels)	1970	1971	1972	1973	1974
Opening Stock	9,000	9,957	11,774	12,054	12,389
Additions					
Discoveries	1,269	2,143	676	824	1,762
Upward Revisions	0	0	0	0	0
Depletions	312	326	396	489	502
Net Change	957	1,817	280	335	1,260
Closing Stock	9,957	11,774	12,054	12,389	13,649
UNIT VALUES (US$/barrel)					
FOB Export Price	1.70	2.21	2.96	3.73	10.80
Production Costs	0.50	0.79	0.78	0.80	1.74
Rent/barrel	1.20	1.42	2.18	2.93	9.06
MONETARY ACCOUNTS (million US$)					
Opening Stock	—	11,948.4	16,719.1	26,277.7	36,299.8
Additions					
Discoveries	1,522.8	3,043.1	1,473.7	2,414.3	15,963.7
Upward Revisions	0	0	0	0	0
Depletions	374.4	462.9	863.3	1,432.8	4,548.1
Net Change	1,148.4	2,580.2	610.4	981.5	11,415.6
Revaluation	—	2,190.5	8,948.2	9,040.6	75,944.6
Closing Stock	11,948.4	16,719.1	26,277.7	36,299.8	123,659.9

oil, which is extracted at the rate of about 100,000 barrels a day.

The physical accounts show the net resource flow, or change in the petroleum reserve, in millions of barrels per year. Depletions, essentially extraction, peaked in 1977 and 1978. Net resource flows were positive during the early 1970s, as reported discoveries exceeded depletion, but have been negative through the latter part of the period.

2. *The Value Accounts*

Petroleum resources are valued by the net price method, defined as the market price less all factor costs of extracting the resource and bringing to the point of sale. The alternative

Table II.4. (cont.) Indonesian Petroleum Accounts

PHYSICAL ACCOUNTS (million barrels)	1975	1976	1977	1978	1979
Opening Stock	13,649	13,342	13,261	12,742	12,246
Additions					
Discoveries	170	469	94	101	76
Upward Revisions	0	0	2	0	1
Depletions	477	550	615	597	581
Net Change	−307	−81	−519	−496	−504
Closing Stock	13,342	13,261	12,742	12,246	11,742
UNIT VALUES (US$/barrel)					
FOB Export Price	12.60	12.70	13.63	13.63	13.98
Production Costs	2.36	2.14	1.49	1.52	1.96
Rent/barrel	10.24	10.56	12.14	12.11	12.02
MONETARY ACCOUNTS (million US$)					
Opening Stock	123,659.9	136,622.1	140,036.2	154,687.9	148,299.1
Additions					
Discoveries	1,740.8	4,952.6	1,141.2	1,223.1	913.5
Upward Revisions	0	0	24.3	0	12.0
Depletions	4,884.5	5,808.0	7,466.1	7,229.7	6,983.6
Net Change	−3,143.7	−855.4	−6,300.6	−6,006.6	−6,058.1
Revaluation	16,105.8	4,269.5	20,952.3	−382.2	−1,102.1
Closing Stock	136,622.1	140,036.2	154,687.9	148,299.1	141,138.8

method—estimating the present value of future net income from the field—requires estimates of recoverable reserves, production costs, future output prices, and interest rates that are not available. As with timber, the market price is measured as the f.o.b. export price, which is also the opportunity cost of sales on the domestic market. The unit cost panel in the resource accounts gives the f.o.b. export price for 1970–84 in U.S.$ per barrel.

The factor costs of developing, extracting, and transporting a barrel of oil are estimated for the same time period by dividing the total annual expenditures for exploration and development of the contracting companies by their total annual production.[14] More detailed data on costs per barrel are calculated by the companies and submitted to PERTAMINA in accordance with contract provisions, but are sensitive and not publicly available. The cost

Table II.4. (cont.) Indonesian Petroleum Accounts

	1980	1981	1982	1983	1984
PHYSICAL ACCOUNTS (million barrels)					
Opening Stock	11,742	11,306	10,943	10,631	10,181
Additions					
Discoveries	141	223	172	71	67
Upward Revisions	0	0	0	0	0
Depletions	577	586	484	521	517
Net Change	-436	-363	-312	-450	-450
Closing Stock	11,306	10,943	10,631	10,181	9,731
UNIT VALUES (US$/barrel)					
FOB Export Price	28.11	35.83	35.74	34.75	31.94
Production Costs	3.80	5.50	8.59	9.15	7.64
Rent/barrel	24.31	30.33	27.15	25.60	24.30
MONETARY ACCOUNTS (million US$)					
Opening Stock	141,138.8	274,848.9	331,901.2	288,631.6	260,633.6
Additions					
Discoveries	3,427.7	6,763.6	4,669.8	1,817.6	1,628.1
Upward Revisions	0	0	0	0	0
Depletions	14,026.9	17,773.4	13,140.6	13,337.6	12,563.1
Net Change	-10,599.2	-11,009.8	-8,470.8	-11,520.0	-10,935.0
Revaluation	144,309.2	68,062.1	-34,798.7	-16,478.1	-13,235.3
Closing Stock	274,848.9	331,901.2	288,631.6	260,633.6	236,463.3

estimates used in this exercise are reasonable approximations, according to industry experts. PERTAMINA, which accounts for less than 10 percent of production, was excluded for lack of data, so the implicit assumption is that PERTAMINA's cost structure equals the average for the industry. Exploration costs are treated as current production costs in this exercise while taxes and royalties are not treated as production costs.

The difference between unit revenues and costs gives the resource rent per barrel of oil. It rises sharply over the period in response to increases in petroleum prices. Since 1985, average rents per barrel have declined even more sharply than world oil prices have. This rent is divided between the contractors and the government in accordance with the terms of the various production contracts in force. The reduction in government rental receipts from

petroleum has forced a sharp curtailment in development expenditures.

The final monetary accounts presents the values of stocks and flows in current dollar figures. They are analogous to the value accounts given for forest resources: they value the net additions to and subtractions from the resource base in terms of the relevant economic rent. In the petroleum sector, the sharp swing from positive to negative value flows stems from the fact that extractions began to exceed apparent additions to reserves at the time when the unit value of the resource was rising sharply. From 1980 to 1984, the annual net resource depletion on petroleum account exceeded U.S. $10 billion, an amount that is significant relative to annual GDP growth and annual gross fixed capital formation. Treating this net depletion of a limited natural resource asset as current income rather than asset depreciation must seriously distort perception and analysis of Indonesia's economic performance.

C. Indonesia's Soil Account: Java

Soil erosion has both physical and economic effects. Removing part of the topsoil and depositing it elsewhere lowers the agricultural potential and economic value of the eroded land. The loss of potential future farm income is equivalent to the depreciation of an economic asset. Besides the on-site costs of soil erosion are off-site or downstream costs, such as siltation of reservoirs and irrigation systems, harbors, and other waterways.

1. Estimates of Soil Erosion in Physical Terms

Comprehensive data on soil erosion in Indonesia are not available, so estimates were based on erosion models. (The relevant determinants of soil erosion are the topography, climate, soil characteristics, and land uses of the specific areas affected.) Among the data available with which to estimate erosion rates are maps at the scale 1:1,000,000 of three variables that play a major role in determining erosion rates—soil types and slope, rainfall erosivity and land use.

The soil map used for this study (FAO, 1959) combines soil types with topography to create 25 soil classes:

—five classes of soils on level to undulating land, with dominant slopes under 8 percent (units 01-05);
—eleven classes of soils on rolling to hilly land, with dominant slopes from 8-30 percent (units 06-16); and
—nine classes of soils on hilly to mountainous land, with dominant slopes over 30 percent (units 17-25).

(Areas of soil types by province are included in Annex Table A.1.)

The kinetic energy released as raindrops strike the ground contributes to soil erosion. Bols (1978) has prepared a map of Java based on correlations of a measure of the kinetic energy of storms with annual rainfall data, which is available for most of Java over an extended period. Eleven rainfall erosivity classes are mapped at a scale of 1:1,000,000. (Area estimates for each erosivity class are shown in Annex Table A.2.) In 1985 the Ministry of Forestry produced a land use map of Java, which distinguishes five types of land use (or vegetation cover) that influence erosion rates:

—Areas of *sawah* (irrigated ricefields), including fishponds. These areas are characterized by low erosion rates; in fact, in large areas sedimentation prevails over erosion;

—Areas of *tegal* (dryland farming), mostly on sloping uplands where erosion rates are very high;

—Areas of natural and planted forest, including perennial plantation crops where erosion is slight;

—Degraded forest areas, including areas of shifting cultivation and degraded *pekarangan* (home gardens) where erosion is moderate to high; and

—Wetlands, where erosion is low.
(See Table II.5.)

Aggregate land use data of questionable reliability are also available for Java from the Central Bureau of Statistics. *(See Table II.6.)* The mapped areas of *sawah* exceed the Central Bureau of Statistics figures for every province, totalling about one third more land for the whole of Java. The Forestry Ministry map is based in part on aerial photos that can measure *sawah* area accurately. Provincial discrepancies for *tegal*, on which erosion is more severe, range from 80 to 177 percent of CBS estimates, but for Java as a whole average only 11 percent.

Given these discrepancies, the estimates of per hectare erosion rates were based on the forestry map, which could be matched spatially with the other elements of the soil erosion model. However, because the Central Bureau of Statistics estimates for land uses other than *sawah* appear to be somewhat more reliable in the aggregate, this data is used in the final economic calculations.

The three maps described above were converted to digital form and analyzed using the Geobased System by the World Bank's Environmental Operations and Strategy Division.[15] Essentially, the procedure overlays the three maps to estimate land areas by 1,375 possible combinations of slope and soil type, erosivity, and land use. The analysis also divided Java along provincial boundaries to generate 5,500 possible combinations.[16]

The estimates of actual erosion rates corresponding to each of the possible combinations were based on actual measurements under given conditions of plant cover or cropping when possible, supplemented by judgments based on erosion elsewhere under comparable conditions. Several recent projects on Java have yielded valuable data on actual erosion of uplands. These include the successive UNDP/FAO Projects in the upper Solo watershed, the USAID Project in the Citanduy watershed, the Dutch-sponsored projects in the upper Brantas (Kali Konto), and the Upland Agricultural Projects of Jogyakarta and the Jratunseluna watersheds financed by USAID and the World Bank. Other erosion data have been collected by the Soils Department of the Agricultural University in Bogor, by the Soil Research Centre in Bogor, and by the Watershed Management Centre in Solo.

Table II.5. Land Use on Java ('000 ha)

Land Use	West Java	Central Java	Jogyakarta	East Java	Java
Sawah	1,350	1,380	121	1,752	4,603
Forest	542	731	4	1,222	2,499
Degraded Forest	299	34	—	53	386
Wetlands	—	29	—	103	132
Tegal	2,546	1,127	210	1,401	5,283
TOTAL	4,737	3,301	335	4,531	12,903

Source: Calculated from Ministry of Forestry (1985)

Table II.6. Comparison of Land Use Estimates ('000 ha)

Sawah Area Estimates	CBS	Ministry of Forestry	Model as Percent
West Java[a]	1,215	1,350	110
Central Java	1,023	1,380	135
Jogyakarta	64	121	191
East Java	1,199	1,752	146
JAVA	3,501	4,603	131
Tegal Area Estimates[b]			
West Java	1,440	2,546	177
Central Java	1,366	1,127	82
Jogyakarta	196	210	107
East Java	1,744	1,401	80
JAVA	4,747	5,283	111

a. Including D.K.I. Jakarta.
b. House compound and surroundings and bareland/border/shifting cultivation.

Estimates of annual soil loss by soil type and land use for Java's four provinces are presented in Annex Tables A.3–A.6. Table II.7 shows *tegal* suffers by far the greatest per hectare and total soil loss. On a per hectare basis, soil loss is highest on *tegal* land on West Java, followed by *tegal* on Central Java. The soils of East Java are least subject to erosion.

If it is assumed that geologic erosion, the rate of soil loss that occurs without human intervention, is similar to that which occurs under forest cover, incremental erosion due to human intervention can be estimated by the difference between per-hectare loss on forestland and on *tegal*. On average, each hectare that is deforested and brought into agricultural production causes the loss of an additional 133 metric tons annually. In the calculations that follow, no attempt is made to segregate the costs of man-made erosion.

2. Estimates of the Economic Costs of Erosion

Erosion reduces the availability and concentration of plant nutrients and alters soil structure in ways that affect water availability and root growth. Subsoil weathering may partially replace these soil elements over the long term.[17] Erosion's impacts on productivity depend on soil type and crop. Some soils contain most of their organic matter in the top few centimeters. In other soils, nutrients are dispersed over the whole soil profile. In addition, such demanding crops as tobacco suffer more drastically from nutrient loss than non-demanding crops—cassava, for example. This study distinguishes two groups of rainfed food crops:

—sensitive crops (maize, soybeans, groundnuts, green beans, and dryland rice)
—insensitive crops (cassava).

Table II.7. Predicted Soil Loss By Region and Land Use (metric tons per hectare and hundred thousand metric tons)

	West Java		Central Java		Jogyakarta	
	per ha	total	per ha	total	per ha	total
Tegal	168.1	4,279	145.8	1,643	108.1	227
Forest Land	10.3	56	5.3	39	5	0.2
Degraded Forest	100.3	300	38.2	13	0	0
Sawah	0.8	11	0.4	6	0.4	0.5
TOTAL	98.1	4,647	52.0	1,701	68.0	227

	East Java		JAVA	
	per ha	total	per ha	total
Tegal	87.2	1,221	139.5	7,370
Forest Land	4.4	54	6.0	150
Degraded Forest	50.9	27	88.3	341
Sawah	0.3	6	0.5	23
TOTAL	29.5	1,308	61.7	7,883

Few studies of erosion effects on yields are available for Indonesia. From scanty experimental data, yield-erosion relationships have been estimated for the study's 25 soil types and two crop groups, as shown in Tables II.8 and II.9. Soil losses of less than 15 tons/ha/yr are estimated to result in no yield loss.[18] Applying these estimates of productivity loss to the areas of the different soil types under *tegal* yields estimates of the extent and severity of physical yield loss. *(See Tables II.10 and II.11.)* This procedure predicts average yield losses of 6.8 percent per year for sensitive crops and losses of 4.3 percent per year for insensitive crops. Among provinces, Jogyakarta is the most severely affected, followed in descending order by West, East, and Central Java.

These predicted yield declines can only cautiously be compared with actual yield trends for dryland crops, which have consistently risen, despite erosion, because of continued intensification of farming practices. From 1972 through 1983, upland rice, maize, and cassava yields on Java increased on average by 4.3, 4.7, and 2.8 percent per year, respectively. (Roche 1987) However, fertilizer use on maize increased from 38 kg/ha to nearly 106 kg/ha and on cassava from 8 kg/ha to more than 16 kg/ha. (Central Bureau of Statistics) Labor costs have also been rising on upland crops. (Roche 1987) The release and rapid adoption of high-yielding maize varieties may also have masked declines in the productivity of the resource base.[19]

Table II.8. Productivity Loss Estimates as a Result of Soil Erosion for Major Soils of Java

I. For Maize, Soybeans, Groundnuts

Soil Loss (tons/ha/year)	Soil Types			
	1, 17	2, 3, 4, 6, 9, 16	5, 8, 10, 11, 12, 15, 18, 20, 21, 25	7, 13, 14, 19, 22, 23, 24
0–15	0.00	0.00	0.00	0.00
15–60	0.02	0.03	0.05	0.07
60–250	0.03	0.05	0.08	0.10
250–600	0.04	0.07	0.10	0.12
Over 600	0.05	0.09	0.12	0.15

As the results of erosion, farm output and income have fallen in some regions without major changes in farm practices; some farmers have been induced to change cropping patterns and input use; and, in extreme cases, land has been withdrawn from cultivation. McIntosh and Effendi (1983) cite the example of the upper Citanduy Watershed, where farmers grow corn, upland rice, and cassava on better soils. As erosion becomes more severe, rice is replaced by peanuts, and on nearly depleted soils only cassava is grown.

Whatever the response, farm revenues decline as crop output falls, but costs may not. Erosion may lead some farmers to work harder and purchase more fertilizer to make up for productivity losses, while costs for harvest labor, crop transport, and other inputs might decrease. Available farm budget data suggest that costs that would fall along with output account for a small share of farm production costs, so erosion lowers net farm income and eventually leads to the adoption of less profitable crops.

To account for adjustments in cropping systems, a variety of farm level data for Java's provinces were used to develop sets of representative farm budgets.[20] The budgets published by Roche were updated to 1985 prices, adjusted to reflect yield changes by

Table II.9. Productivity Loss Estimates as a Result of Soil Erosion for Major Soils of Java

II. For Cassava

Soil Loss (tons/ha/year)	Soil Types			
	1, 17	2, 3, 4, 6, 9, 16	5, 8, 10, 11, 12, 15, 18, 20, 21, 25	7, 13, 14, 19, 22, 23, 24
0–15	0.00	0.00	0.00	0.00
15–60	0.01	0.02	0.03	0.05
60–250	0.02	0.03	0.05	0.06
250–600	0.03	0.05	0.07	0.08
Over 600	0.04	0.07	0.10	0.12

Table II.10. Area and Severity of Estimated Erosion-Induced Productivity Losses on Tegal on Java

	Annual Productivity Loss as a Percent of Current Total Productivity[a]				
	0%	2%	3%	5%	7%
			Area ('000 ha)		
West Java	512	3	27	417	22
Central Java	190	1	120	216	3
Jogyakarta	19	0	26	0	0
East Java	194	45	91	128	67
JAVA	914	49	264	762	92

	Annual Productivity Loss as a Percent of Current Total Productivity				
	8%	10%	12%	Total Area	Average Productivity Loss (%)
			Area ('000 ha)		
West Java	429	802	351	2,563	7.0
Central Java	168	366	61	1,126	6.4
Jogyakarta	47	118	0	209	7.8
East Java	481	408	0	1,413	6.6
JAVA	1,125	1,693	412	5,312	6.8

a. Productivity loss based on maize.

Note: All values do not sum exactly due to rounding.

using the Central Bureau of Statistics and Malang data, and then used to estimate the effects of yield losses on net farm incomes. Insofar as can be determined, the farm budgets are consistent with land values and rental rates for *tegal*.

Table II.12 summarizes the cropping systems for each region and provides an estimate of their relative occurrence. These farming systems appeared to be marked by a large proportion of fixed costs. Costs categories in the Central Bureau of Statistics that seem most likely to vary with output are harvesting labor and transportation. These variable costs were assumed to decline in proportion to cassava yield declines, while yields of maize and other more sensitive intercropped cultivars declined further. Consequently, farm income declines linearly as erosion increases, at rates that vary by cropping system and by region.

The estimated loss in farm income from a 1-percent decline in yield depends on both the basic profitability of the cropping system and the importance of fixed production costs. On the assumption that the farming systems are distributed independently of rates of productivity decline, in Table II.12 the costs of a 1-percent decline in productivity for each cropping system and the predicted weighted average yield declines are applied to the *tegal* areas allocated to each cropping system. These costs are for only a single year. But, the appropriate economic measure of soil depletion is the present value of losses in farm income in current and future years.

Table II.11. Area and Severity of Estimated Erosion-Induced Productivity Losses on Tegal on Java

	Annual Productivity Loss as a Percent of Current Total Productivity[a]				
	0%	1%	2%	3%	5%
			Area ('000 ha)		
West Java	512	3	27	417	451
Central Java	190	1	120	216	171
Jogyakarta	19	0	26	0	47
East Java	194	45	91	128	548
JAVA	914	49	264	762	1,217

	Annual Productivity Loss as a Percent of Current Total Productivity				
	6%	7%	8%	Total Area	Average Productivity Loss (%)
			Area ('000 ha)		
West Java	659	144	351	2,563	4.4
Central Java	201	165	61	1,126	4.1
Jogyakarta	118	0	0	209	4.7
East Java	394	14	0	1,413	4.1
JAVA	1,371	322	412	5,312	4.3

a. Productivity loss based on cassava.

Note: All values do not sum exactly due to rounding.

If soil loss is recurrent and exceeds soil formation, productivity losses occur with each successive net loss of soil depth. The correct measure of the cost of the initial episode of erosion is the capitalized value of the infinite stream of productivity losses associated with that episode. Loss of productivity associated with future erosion should be charged against income when it occurs.

On Java, erosion is clearly a recurrent phenomenon, and productivity losses are permanent. As productivity falls, land eventually goes out of production, and its production value falls to zero. Current and future technical change that raises farm productivity has no effect on these losses unless technical change is faster on good soils or, on the contrary, is driven to compensate for erosion losses. If the former holds true, as is likely, the cost of erosion is larger than estimated above.

The one-year costs of erosion have been capitalized to obtain a total present value of future losses of Rp 539 billion (U.S. $484 million). To put this figure into perspective, Table II.13 shows the approximate value of output of six major rainfed crops at 1983/84 prices. The *one-year* costs of erosion are about 4 percent of the annual value of dryland farm output, and they are of the same order of magnitude as annual recorded *growth* in agricultural production in the uplands. Thus, despite apparently healthy growth, upland farming on Java has

Table II.12. Costs Due to Soil Erosion for Various Cropping Systems on Java

Cropping System	Crops	Estimated Proportion of Tegal (%)	Area[a] ('000 ha)	Estimated Current Net Income (Rp/ha)[b]	Weighted Production Loss (%)[c]	Annual Cost of a One Percent Productivity Decline (Rp/ha)	Single Year Cost (million Rp)	Capitalized Cost (million Rp)
West Java								
I	Cassava, Corn Upland Rice & Legumes	58	835	139,496	4.4	4,309	15,831	158,310
II	Cassava, Corn & Upland Rice	27	389	49,531	4.4	3,616	6,186	61,860
III	Pure Stand Cassava	15	216	1,279	4.4	1,563	1,485	14,850
Total Tegal		100	1,440	95,039	4.4	3,718	23,508	235,080
Central Java								
I	Intercropped Corn & Cassava	57	779	6,698	4.1	800	2,555	25,550
II	Intercropped Corn, Cassava & Legumes	43	587	10,183	4.1	937	2,255	22,550
Total Tegal		100	1,366	8,196	4.1	859	4,810	48,100

a. Based on Central Bureau of Statistics. *See* Table II.6.
b. Net income equal to returns to land and management.
c. Based conservatively on rates for land cultivated in Cassava. Annual productivity loss for sensitive crops ranges from 6.8 to 7.8 percent.

Source: Adapted from Roche 1984, Central Bureau of Statistics, and data provided by the Agroeconomic Survey, Bogor. *See* Magrath, Arens, 1987.

Table II.12 (cont.)

Cropping System	Crops	Estimated Proportion of Tegal (%)	Area[a] ('000 ha)	Estimated Current Net Income (Rp/ha)[b]	Weighted Production Loss (%)[c]	Annual Cost of a One Percent Productivity Decline (Rp/ha)	Single Year Cost (million Rp)	Capitalized Cost (million Rp)
Jogyakarta								
I	Intercropped Corn & Cassava	57	112	8,220	4.7	1,011	532	5,320
II	Intercropped Corn, Cassava & Legumes	43	84	11,279	4.7	1,047	416	4,160
Total Tegal		100	196	9,531	4.7	1,026	948	9,480
East Java								
I	Intercropped Corn & Cassava Level Tegal	30	523	298,327	4.1	4,926	10,567	105,670
II	Intercropped Corn & Cassava Terraced Hillsides	30	523	58,130	4.1	2,876	6,169	61,690
III	Pure Stand Cassava Level Tegal	20	349	145,005	4.1	3,746	5,357	53,570
IV	Pure Stand Cassava Terraced Hillsides	20	349	27,806	4.1	1,816	2,597	25,970
Total Tegal		100	1,744	141,499	4.1	3,453	24,690	246,900
TOTAL TEGAL			4,747	83,649	4.3	2,686	53,956	539,560

Table II.13. Comparison of the Value of Output of Six Major Rainfed Crops to the Cost of Erosion (million rupiah)

	West Java	Central Java	Jogyakarta	East Java	JAVA
Dry Rice	46,533	18,194	12,682	26,358	103,767
Maize	21,809	123,596	15,061	262,981	423,447
Cassava	81,041	109,148	22,410	134,962	347,561
Sweet Potatoes	22,191	12,131	542	15,331	50,195
Peanuts	44,916	56,475	18,340	74,615	194,346
Soybeans	17,807	45,398	37,664	124,171	225,040
Total	234,297	364,942	106,699	638,418	1,344,356
Cost of Single Year Erosion Loss	23,508	4,810	948	24,690	53,956
Capitalized Value of Erosion Losses	235,080	48,100	9,480	246,900	539,560
Single-year Erosion Cost as a Fraction of Value of Agricultural Output	0.10	0.01	0.01	0.04	0.04

been on a treadmill: each current increment in production is offset by an equal but unrecorded loss in soil productivity.

The capitalized losses in future productivity are approximately 40 percent of the annual value of upland farm production. If erosion losses are regarded as the cost of obtaining the current year's livelihood from vulnerable upland soils, then these estimates show the bargain to be harsh. Nearly 40 cents in future income is sacrificed to obtain each dollar for current consumption. Whether such a bargain can be sustained is open to question, but ignoring the heavy costs of current farming practices unquestionably overstates dryland agricultural income.

The methodology and data used in estimating erosion costs produced results for a single year, 1985. Benchmark data for other years were not available. To extrapolate the results crudely to other years in the period under review, a double indexation procedure was used. First, physical erosion rates were indexed to the area under *tegal*. Since such other factors as topography, soil type, and climate remained constant throughout the period or varied randomly, physical erosion rates varied systematically only with changes in land use, of which

conversion to annual cropping is the most important. (In fact, the area in upland crops changed little.) Then, the costs of given rates of erosion were indexed to dryland crop prices on the assumptions that 1) cropping patterns and practices changed little, and 2) net farm income remained a constant proportion of farm revenues. While these assumptions cannot be readily verified with existing data, indexation does at least correct for the general inflationary rise in farm prices during the period. *(See Table II.14.)*

Erosion simply moves soil particles from one place to another. The deposition of sediment on *sawahs* renews their fertility. More commonly, however, the off-site effects of soil erosion are negative. Silt clogs irrigation channels and ports, and it lowers the capacity of water-storage reservoirs.

Only a crude attempt was made to estimate the magnitudes of such costs as the increased expenditures needed to dredge waterways and clean irrigation channels.[21] These additional annual costs due to upstream erosion appear to be in the range of U.S. $15-50 million, an order of magnitude less than on-site productivity losses. Moreover, such costs already enter the national income and product accounts as additional government expenditures. This illustrates another anomaly of the current

Table II.14. Estimates of Erosion Losses 1971–1985

Year	Total Tegal in Java[a]	Per ha. Cost of a 1% Loss in Productivity[b]	Average Productivity Loss on Cultivated Area (%)	Single-year Cost of Erosion (mill. Rp.)	Capitalized Cost of Erosion (mill. Rp.)
1971	4,377	312.42	4.3%	5,880	58,800
1972	3,988	354.90	4.3	6,086	60,860
1973	4,777	471.77	4.3	9,691	96,910
1974	4,484	692.40	4.3	13,350	133,500
1975	4,232	781.63	4.3	14,224	142,240
1976	3,642	894.66	4.3	14,011	140,110
1977	3,982	1,019.92	4.3	17,464	174,640
1978	4,522	1,100.44	4.3	21,398	213,980
1979	4,111	1,288.32	4.3	22,774	227,740
1980	4,123	1,485.14	4.3	26,330	263,330
1981	4,356	1,610.40	4.3	30,164	301,640
1982	3,319	1,843.01	4.3	26,303	263,030
1983	4,081	2,308.24	4.3	40,506	405,060
1984	4,416	2,540.85	4.3	48,248	482,480
1985	4,747	2,686.00	4.3	53,956[c]	539,560

a. In thousands of hectares. Based on estimates of dryland crops in Java from Central Bureau of Statistics, Jakarta 1972-1984.
b. Current rupiah per hectare. The 1985 value is based on detailed budget analysis. Values for 1971-1984 are derived using indices of crop prices faced by farmers and the assumption that the ratio between revenue and the cost of a 1% productivity loss remained constant.
c. Value does not sum exactly due to averaging.

income-accounting system since these erosion costs enter with a positive sign—as *additions* to national income. Although the expenditures are made to prevent even greater damages from siltation, they are entered as additions to income and the production of goods and services because the expenditures are incurred by households and the government and are therefore defined as final expenditures. Were such "defensive" expenditures subtracted from the value of final output, Indonesian national income would be roughly $30-$100 million lower in each year.

D. Concluding Remarks

Three general points will suffice here:

First, these estimates were prepared with a modest expenditure of time and money, drawing entirely on data source and information already available, mostly in published sources. Estimation required some interpolation between benchmark years and extrapolation from samples of limited coverage, but such techniques are already common in national income accounting.

Second, the results require a significant reassessment of Indonesia's economic performance during the period, and they bring to light aspects of the sustainability of Indonesia's economic growth strategy that would not be readily apparent from the conventional national income accounting framework.

Third, efforts to improve the accuracy and coverage of such resource accounts are entirely complementary to efforts to improve the information base for better resource management. For example, the Government of Indonesia, with external assistance, is embarking on a new inventory of timber resources that will increase the accuracy of forest resource accounts and also provide better guidance in allocating timber concessions, delineating protected forest areas, siting transmigration projects, and other resource management decisions. The same kinds of data needed for resource accounting are essential for effective resource management.

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Annex

ANNEX A.1. Soils on Java Based on Slope and Soil Characteristics ('000 ha)

Soil Type	West Java	Central Java	Jogyakarta	East Java	JAVA
1	8	49		2	57
2	712	562	41	971	2,323
3	61	20	5	14	77
4	36	259	3	210	540
5		27			29
6			22	54	77
7	171	349	18	211	753
8	45			13	24
9	11	164		149	400
10	646	400		190	1242
11	67				91
12	223	10		4	237
13	174				174
14	308	36	82	111	738
15		200	3	153	359
16				26	21
17	116	175	60	259	609
18		7		451	481
19				12	13
20	537	384		309	1,210
21	149	198		227	571
22	582				582
23	722	131			850
24	6	202	34	196	425
25	160	128	66	608	979
TOTAL	4,737	3,301	335	4,170	12,868

Source: Calculated from FAO (1959).

ANNEX A.2. Areas of Java Subject to Alternative Levels of Erosivity ('000 ha)

Erosivity Level	West Java	Central Java	Jogyakarta	East Java	JAVA
1				115	104
2	314	151	10	1,178	1,632
3	644	377	170	2,178	3,360
4	757	902	89	436	2,217
5	771	696	48	367	1,882
6	872	459	17	196	1,546
7	670	302		96	995
8	575	249		47	867
9	21	111		3	135
10		43			36
11		13			13
TOTAL	4,625	3,304	334	4,612	12,788

Source: Calculated from Bols (1978).

ANNEX A.3. Predicted Soil Losses From Tegal By Region and Soil Type ('000 metric tons)

Soil Type	West Java	Central Java	Jogyakarta	East Java	JAVA
1	0	20	10	0	20
2	632	398	38	531	1,599
3	49	40	18	19	126
4	114	194	9	153	469
5	0	0	0	0	0
6	0	0	352	891	1,242
7	9,482	11,776	178	5,278	26,715
8	88	0	0	0	88
9	445	424	0	953	1,821
10	11,222	6,672	0	412	18,306
11	1,251	0	0	0	1,251
12	4,156	91	0	8	4,255
13	948	0	0	0	975
14	40,122	3,484	7,259	19,911	70,775
15	0	9,724	0	4,985	14,710
16	0	0	0	294	294
17	2,123	7,594	856	3,894	14,467
18	0	309	0	11,006	11,315
19	0	0	0	592	592
20	47,146	52,024	0	20,790	119,960
21	21,227	30,495	0	4,694	56,416
22	93,831	0	0	0	93,831
23	159,716	6,317	0	0	166,033
24	6,372	21,618	5,052	14,967	48,008
25	28,939	13,095	8,906	32,754	83,695
TOTAL	427,863	164,274	22,668	122,132	736,963

ANNEX A.4. Predicted Soil Loss from Sawah by Region and Soil Type ('000 metric tons)

Soil Type	West Java	Central Java	Jogyakarta	East Java	JAVA
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	2	0	2
7	29	30	4	7	70
8	3	0	0	0	3
9	1	9	0	5	15
10	71	43	0	3	118
11	11	0	0	0	11
12	5	0	0	0	5
13	111	0	0	0	111
14	0	1	0	30	31
15	0	108	2	37	147
16	0	0	0	0	0
17	128	99	41	91	358
18	0	6	0	132	138
19	0	0	0	0	0
20	244	196	0	95	535
21	63	5	0	8	76
22	164	0	0	0	164
23	112	5	0	0	117
24	0	57	0	91	148
25	148	21	3	83	255
TOTAL	1,091	580	51	582	2,304

ANNEX A.5. Predicted Soil Losses from Forest Land on Java by Region and Soil Type ('000 metric tons)

Soil Type	West Java	Central Java	Jogyakarta	East Java	JAVA
1	0	0	0	0	0
2	2	3	0	0	5
3	0	0	0	0	0
4	0	1	0	0	1
5	0	0	0	0	0
6	0	0	0	2	2
7	0	81	0	18	99
8	0	0	0	2	2
9	0	6	0	2	8
10	86	78	0	7	171
11	0	0	0	0	0
12	0	2	0	0	2
13	0	0	0	0	0
14	0	0	1	176	177
15	0	40	0	194	234
16	0	0	0	0	0
17	0	47	0	178	225
18	0	7	0	174	181
19	0	0	0	17	17
20	0	431	0	779	1,210
21	0	857	0	1,404	2,261
22	2,705	0	0	0	2,705
23	2,851	257	0	0	3,108
24	0	1,860	0	2	1,862
25	0	261	27	2,419	2,708
TOTAL	5,644	3,931	28	5,376	14,979

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ANNEX A.6. Predicted Soil Losses from Degraded Forest on Java by Region and Soil Type ('000 metric tons)

Soil Type	West Java	Central Java	Jogyakarta	East Java	JAVA
1	0	2	0	1	3
2	0	0	0	1	1
3	0	0	0	0	0
4	0	0	0	0	1
5	0	1	0	0	0
6	0	0	0	0	0
7	0	588	0	0	588
8	0	0	0	0	0
9	0	0	0	14	14
10	626	0	0	0	766
11	0	140	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	895	895
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	62	62
19	0	0	0	0	0
20	0	539	0	1,000	1,539
21	0	52	0	277	339
22	15,899	0	0	0	15,899
23	13,033	0	0	0	13,033
24	0	0	0	90	90
25	482	0	0	347	829
TOTAL	30,041	1,333	0	2,688	34,062

Notes

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15. Rounding errors in the Geobased System program result in minor discrepancies in area estimates. Consequently, columns and rows may not add exactly. The errors introduced in this way are insignificant.

16. West Java, Central Java, D.I. Jogyakarta, and East Java, D.K.I. Jakarta was included in West Java.

17. For discussion of the impact of erosion on various dimensions of productivity see Pierce and others (1983).

18. It also takes, at least partially, into account the omission of plant cover and conservation practices in the erosion model.

19. For authoritative treatments of maize and cassava production systems in Indonesia, see, respectively, Mink, Dorosh and Perry (1987) and Roche (1984).

20. Crop budgets for many rainfed crops and years are compiled by the Central Bureau of Statistics (CBS) from large sample surveys. They omit family labor, which typically exceeds hired labor use on Java, but probably best depict the aggregate structure of production cost. Because they are available for current years, they were used to identify variable and fixed costs. Data from the Survey Agro Ekonomi (Agro-economic Survey) was also compared with the budgets prepared by Roche (1983, 1984). Roche's budgets, based on detail surveys of small samples of farmers throughout Java, include information on family and hired labor, purchased inputs and yields. Data from the Malang Institute for Food Crops (MARIF) (Brotonegoro, Laumans and Stavern 1986) were used to adjust Roche's budget to make it more representative of East Java as a whole. The MARIF data shows that Kediri Kabupaten has yields between 40 and 175 percent higher, depending on crop, than the average for East Java. In addition fertilizer use in Kediri is almost double that of the rest of East Java.

21. More detail is available in W.B. Magrath and P.L. Arens, "The Costs of Soil Erosion on Java: A Natural Resource Accounting Approach," unpublished paper, World Resources Institute, November 1987. (Forthcoming as World Bank Environment Department Working Paper).

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World Resources Institute

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The World Resources Institute (WRI) is a policy research center created in late 1982 to help governments, international organizations, and private business address a fundamental question: How can societies meet basic human needs and nurture economic growth without undermining the natural resources and environmental integrity on which life, economic vitality, and international security depend?

Two dominant concerns influence WRI's choice of projects and other activities:

The destructive effects of poor resource management on economic development and the alleviation of poverty in developing countries; and

The new generation of globally important environmental and resource problems that threaten the economic and environmental interests of the United States and other industrial countries and that have not been addressed with authority in their laws.

The Institute's current areas of policy research include tropical forests, biological diversity, sustainable agriculture, energy, climate change, atmospheric pollution, economic incentives for sustainable development, and resource and environmental information.

WRI's research is aimed at providing accurate information about global resources and population, identifying emerging issues and developing politically and economically workable proposals.

In developing countries WRI provides field services and technical program support for governments and non-governmental organizations trying to manage natural resources sustainably.

WRI's work is carried out by an interdisciplinary staff of scientists and experts augmented by a network of formal advisors, collaborators, and cooperating institutions in 50 countries.

WRI is funded by private foundations, United Nations and governmental agencies, corporations, and concerned individuals.

INTERNATIONAL CONSERVATION FINANCING PROJECT

- EXECUTIVE SUMMARY -

The environmental problems facing policy-makers today are unprecedented. Until recently, air pollution, deforestation, the spread of deserts, and loss of biological diversity may have appeared as distant, isolated threats, having little impact upon domestic economic growth. But, current evidence has created increasing political awareness that mismanagement of natural resources is profoundly changing the natural systems that support the world economy.

Because these problems are global, international cooperation will be essential for devising and implementing strategies to maintain the earth's natural resource base. Developing countries --many of which are already struggling to meet the needs of their burgeoning populations and to service their external debts-- are going to need substantially more capital to carry out conservation measures. In the spirit of the Brundtland Commission's definition of sustainable development, this study defines conservation as maintaining natural resources as the basis for meeting the needs of current and future generations. While unmet conservation financing needs in developing countries are difficult to gauge precisely, indications are that as much as $20-50 billion will be needed per annum over the next decade.

Through increased cooperation, existing institutions can effectively mobilize greater flows of capital from the industrialized to the developing economies for projects that promote better management of natural resources. Much of the cooperative efforts to date have depended on steady flows of official development assistance, which currently exceed $40 billion per year. Development assistance agencies have started to take steps to ensure that their projects promote sustainable resource use. They can do still more to prevent ecological degradation by formulating comprehensive policies to ensure that critical ecosystems are not sacrificed, by assuring that conservation is integrated as an essential component into development, local institutional capabilities are build up, and environmentally unsound projects and policies are dismantled.

Investments in conservation, like investments in education, health, and infrastructure have long-term economic benefits that can be difficult to quantify. Because conservation generally has a long payback period, public, as well as private sector investors tend to avoid financing conservation projects. Yet, innovative business strategies, coupled with government incentives and regulations, can lead to increased private sector investment in conservation. Timber traders concerned about depletion of primary tropical forests are now willing to fund programs that promote sustainable tropical forest management; and financial intermediaries are starting to create incentives for increasing foreign direct investment in conservation. In addition, studies have shown that, if properly managed, nature-based tourism can substantially benefit local communities,

governments, private sector investors, and the protected areas themselves.

Debt-for-Nature swaps constitute a new conservation financing instrument. It has involved the exchange of heavily discounted commercial debt for local currency commitments to conservation programs in Bolivia, Costa Rica, Ecuador, and the Philippines. Because these swaps rely on donations of private debt or purchases on the secondary market by non-governmental organizations, the amount swapped thus far has been small (less than $100 million) in comparison to the overall Third World debt burden ($1.3 trillion). Nonetheless, swaps have leveraged substantial additional funds for cash-poor natural resource agencies and non-governmental organizations.

Just as businesses must draw up coherent strategies to gain access to capital, so too governments must formulate strategies and action plans to attract international financing for conservation. Several planning exercises have already led to increased donor support and coordination for conservation activities on the national level. For instance, tropical forestry action plans have been completed for 16 countries, and at least 34 more are now in preparation for other countries. Action plans and strategies can also promote badly needed research into the classification and sustainable utilization of biological resources outside the narrow band of species now exploited.

Given the magnitude of the unmet conservation financing needs in the developing world and the urgent need for action to stem the loss of productive potential, complementary initiatives may be needed to fill the gap that existing institutions --as currently structured-- cannot address quickly enough. This study proposes four new initiatives that appear promising.

I. An International Environmental Facility (IEF)

To overcome the obstacles to increased conservation financing, the creation of an International Environmental Facility --exclusively devoted to furthering the preparation and financing of conservation projects-- deserves consideration. More specifically, IEF would pursue these goals by 1) identifying --in collaboration with governments, bilateral aid agencies, MDBs, and others-- the unfunded conservation needs in the Third World; 2) helping to generate well-selected and designed conservation projects by arranging project preparation ("pre-investment") funding; and 3) helping to arrange co-financing, including guarantees, for overall project packages from a variety of existing sources. Essentially, IEF would be a jointly financed inter-agency facility of the OECD's bilateral development agencies and MDBs, that would collaborate with relevant U.N. agencies, Third World governments, and NGOs. An appropriate target might be $3 billion in projects for the first five years, administered by a staff of 100, budgetted at $10 million annually by the fifth year.

II. A Pilot Investment Program for Sustainable Resource Use: "Ecovest"

The private sector's contribution to conservation is essential because it has immense managerial, technological, and financial capabilities. Intermediation similar to that provided by an investment bank is needed to gather long-term capital, spread risks, arrange access to technology, and improve incentives for investments in such activities as wildlife utilization, sustainable forest management, the development of forest products other than timber, sustainable mariculture, etc. It is proposed that one or more pilot investment funds or "Ecovests" be set up, the size of which would be determined after a more detailed study of suitable projects and capital sources. A reasonable target might be $25 to $75 million, which could be effectively invested over three to five years. Capital could be obtained from such sources as development assistance programs, foundations, existing development banks, socially oriented investment funds, and private portfolio investors.

III. Sustainable Resource Management and Debt Reduction

In many Third World countries, economic stagnation and balance-of-payment pressures imposed by the debt crisis have exacerbated natural resource degradation. After prolonged attempts to deal with the debt crisis in conventional financial and macroeconomic terms, policy-makers are searching for innovative approaches to debt reduction that may allow for large-scale improvements in natural resource management. For example, aid agencies are increasing the funding available for purchasing discounted debt to support larger debt-for-nature schemes; donor governments are considering bilateral debt conversion into grants or local currency instruments for financing soil and water conservation; and the sectoral policy reforms that lead to improved natural resource management can boost fiscal revenues, which in turn can be used to buy back discounted debt at secondary market rates with the help of guarantees provided by the World Bank and other lending agencies.

IV. A Global Environment Trust Fund Financed by Levies on Greenhouse Gases

Industrial countries are responsible for a high percentage of the greenhouse gases that have already accumulated in the atmosphere. Adapting to global warming and slowing the pace of climate change will require broad international cooperation and substantial funding, especially in the developing countries. Governments should seriously consider creating a World Environment Fund to support programs to slow down the accumulation of greenhouse gases and help to maintain ecosystems. The Montreal Protocol on Substances that Deplete the Ozone Layer was an important step toward reducing CFC emissions and provides an opportunity for governments to capture a portion of the revenues that will accrue to CFC producers as supply contracts. Another possible revenue source is a carbon tax on various fuels graduated in proportion to how much carbon dioxide each releases. Any charges on greenhouse gases will encourage energy efficiency in the use of fossil fuels and a more rapid adoption of alternative energy sources and CFC substitutes. Preliminary studies suggest that a charges on greenhouse gases will generate billions of dollars in additional revenue. Part of these funds should be managed by an international body with broad representation such as the United Nations Development Programme or the U.N. Trusteeship Council.

Representative SCHEUER. Thank you very much, Mr. Repetto.

Now we'll hear from Mr. Steven Arnold, director of the international development program in the School of International Service of the American University.

Mr. Arnold has worked closely with AID to develop professional training for its midlevel professionals. He has done a significant amount of work evaluating the effectiveness of development organizations, particularly NGO's, on the question of sustainability.

We're delighted to have you here, Mr. Arnold.

Please take such time as you need. I repeat for you all that your prepared statement in full will be printed in the record.

STATEMENT OF STEVEN H. ARNOLD, DIRECTOR, INTERNATIONAL DEVELOPMENT PROGRAM, SCHOOL OF INTERNATIONAL SERVICE, AMERICAN UNIVERSITY

Mr. ARNOLD. Thank you, Congressman Scheuer.

I'd like to add that I applaud your foresight, as do the rest of us, I think, in calling these hearings. In some ways, it may seem a little unusual that the Joint Economic Committee is moving into the area of sustainability in Third World countries.

But I think it's becoming increasingly clear to most everyone that what happens in the Third World obviously comes back and has a terrific impact upon us, and particularly on our national security.

In particularly, the issue of sustainability brings to a national focus a great number of concerns that people have been having for a number of years.

And I think that, in many ways, the Brundtland report is not only the most visible, but also the best piece that has come out in the 1980's dealing with the issue of sustainability, and putting it in a very thoughtful perspective.

The problem I think with the idea of sustainability, is that the word is so inclusive in some ways that has become an enormous tent in which a number of people are able to be included with a variety of different interests, viewpoints, and ideas.

Now, in some ways, this is an advantage. You can have biologists talking to economists for the very first time. You can get people who are macroplanners trying to meet with people at the local levels.

But, at the same time, it also means that you get a number of different people who see it in very different ways. For example, sometimes, you get environmental people looking at it in terms of environmental protection or conservation.

You get other people seeing it in terms of conservation of financial resources.

Congressman Scheuer, you yourself, in reading the Wall Street Journal presentation, showed how clearly people look at sustainability, on the one hand, as the idea that the rain forest is the lungs of the world; on the other hand, it's also a problem, at least in the short term, of sustaining the livelihood of some very poor people who are driven, in a sense, to try deforestation to sustain their own lives.

Representative SCHEUER. Mr. Arnold, I could take a case where I would say to the Third World:

I agree with you. The tropical rain forests belong to you. It's your heritage. It's your resource.

We like to think it's a priceless global resource, too. But, for the purposes of this discussion, let's assume it's your resource.

From your point of view, you're better off harvesting your tropical rain forests on a sustainable yield basis because then you'll provide jobs, you'll provide income, you'll provide careers, you'll provide family sustenance for an infinity of time.

It will be a permanent productive resource for your country. But, if you decide you want to kill the goose that laid the golden egg like a kid who sticks a straw into a glass of chocolate soda, you can suck all those rain forests out in 10 years and export them to Japan and America, hardwood for furniture.

And what is left for your country and for your people?

I think we can prove to the developing countries themselves that managing their resources on a sustainable yield basis, be they wildlife to support tourism, as in Kenya and Tanzania, be they forest resources as in Brazil and Indonesia and Costa Rica, be they grasslands or grazing lands or croplands, as in Sub-Saharan Africa, it's in their economic, their proven identifiable, statistically verifiable economic interest to harvest those resources on a sustainable yield basis.

And for the purpose of that argument, I'm willing to yield the argument that this is a priceless global heritage.

That may ring a little hollow on their ears, when their environmental problems, as they describe them to us, are starvation, illiteracy, disease, and malnutrition.

Don't you feel in reference to the JEC's mission, we can justify these policies of sustainable yield, resource exploitation or resource harvesting, we can justify that in the economic interests of each of these developing countries?

Mr. ARNOLD. I don't disagree with that. I think Mr. Repetto's work in particular is going to be immensely valuable in doing that.

The Brundtland Commission also shows very clearly that, in the long term and, in general, we all benefit. That's the conceptual idea.

But, the other issue is a political issue, which is, in the short-term and immediate cases, there are some people who lose and some people who win.

And I think that's a very, very tough kind of issue. So, in order for the sustainability question really to become a powerful organizing framework, to really do what it has to do, it has to solve two problems simultaneously.

The first problem is conceptual.

How do we in a sense try to relate and integrate all of these different areas that need to be addressed?

The Brundtland report does this absolutely brilliantly.

The other side is the political organizational side. And that is, given the fact that we can now conceptualize how things interconnect, then what do we do with the issue of the tough, political question of what do we do tomorrow? What do we do today in this particular situation? This is where it gets much, much more difficult.

That is where, in fact, I think that both Mr. Repetto and Mr. MacNeill have been illustrating cases from Canada, from the United States and from Brazil where, in the short-term immediate case, it is much more difficult to orchestrate the kind of political coalitions that are necessary to do this.

Part of it is an institutional problem. It has already been recognized, for example, that the environmental issues should be dealt with in one place. But in fact, this very committee has one subcommittee which deals with environment and, yet, some discussions on environment are also appearing in this subcommittee at the same time.

So it's two separate subcommittees within the Joint Economic Committee, both of which are dealing with environmental questions.

The idea is that there's an integrative issue that works conceputally, but organizationally speaking, we have difficulty in pulling that together.

So that's my concern. It's not that I'm against the issue of sustainability at all. I'm just trying to figure out how do we move from the conceptual to the political.

Let me add just a couple of other comments.

The political issues that seem to me to be some of the most crucial would be:

The first issue is the question of whether growth is really possible?

And I think, even within the discussions within the Brundtland Commission, as I understand it, although, of course, I was not there, this was a major area of discussion: How much growth really is possible and on what terms?

Clearly, if you're talking in terms of political coalitions, the smaller the possibility of growing, the greater the effort to pull people on board. I would think that both Mr. MacNeill and Mr. Repetto have stated, and I would certainly agree that we're talking here about pulling together a global coalition. That is, that people in this country have to worry about these issues equally as much, and perhaps more than the people in the poor countries.

Second, if we're talking about the other issue of growth, it's the issue of the question of what actually is to be sustained.

Here we have a number of different tradeoffs. Even more important than this perhaps is the third issue of who gets to decide. Here we had some very interesting discussion going on as to who are in fact the people who would make the decision as to what is to be sustained and what is not to be sustained, and how these policies would be put in place.

Here I think is where a number of the private voluntary organizations and other members of the nongovernmental community might have a rather different perspective from some of the things that would be seen from a more global perspective.

This is not to say that they're inconsistent, but there have been a number of interesting efforts in the operating area where the Inter-American Development Bank is working most currently, where they're trying for the first time to put together a kind of coalition of people who include indigenous people, the government, the international community, and others, to try to put together

some kind of a strategy in which all of those people are being considered, and not simply having it mandated from one small group.

This, I think, particularly given the fact that development is a costly process, is a rather important issue to consider.

I can add more in my testimony later, but I think that's all for the present.

Thank you.

[The prepared statement of Mr. Arnold follows:]

PREPARED STATEMENT OF STEVEN H. ARNOLD

Mr. Chairman and Members of the Subcommittee:

I appreciate your invitation to present my views in this series of hearings on Sustainable Development and Economic Growth in the Third World, which focuses this morning on the issue of defining the concept of sustainability and using it as a guide for policy and action.

This issue may appear to some to be an unusual one for your subcommittee to address in such depth. But what these hearings reflect, I think, is a recognition of the growing concern world wide that current development programs may not be sustainable, and that this can seriously affect the national security interests not only of Third World nations but of the United States itself. As we prepare to enter not only a new century but a new millennium, many mainstream Americans, ranging from members of the Audubon Society to the newly formed WorldWise 2000, see the next decade as

critical in determing, perhaps irrevocably, the direction of our own future and that of our children. And, while "high politics" issues such as nuclear war and military strategy remain troubling, of equal concern are the emerging economic and environmental issues which will have an equivalently powerful impact upon our way of life. It is in this context, then, that the question of sustainable development needs to be considered.

Sustainability in one form or another has always been an objective of Third World development. What is new, however, is the increasing concern from many quarters that this is not being achieved. The Report of the World Commission on Environment and Development (Brundtland Report) is only the most visible of many recent studies documenting problems of sustainability at all levels: a large majority of development projects and programs seem unable to create long-term benefits or institutions that last beyond direct donor involvement; many Third World nations appear locked into a vicious cycle of economic decline, increasing poverty, and environmental degradation; and the world as a whole now seems to be facing both financial and ecological problems uprecedented in scope and seriousness.

Given such concerns, it is hardly surprising that the question of sustainability now dominates virtually every aspect of the international development debate. Many now consider this an opportunity to revitalize development thinking and action by elevating this concern with sustainability to the status of the central organizing concept of a revised development approach, providing important new insights and reformulating goals and stratgegies for all levels of activities, from the local to the global.

But is this use of the concept of "sustainability" itself sustainable?

The inclusive nature of the concept is a potential advantage, and has brought together, often for the first time, biologists and economists, rich and poor nations, macro planners and local communities to deal with development problems. But such inclusivity can be a weakness as well as a strength. While it has been relatively easy to gather support for the concept of sustainability at a rhetorical level, there is the danger that the term has become so inclusive that it runs the risk of becoming a meaningless catch phrase, cynically regarded by development professionals as simply one more form to fill out in the project cycle.

To evolve into a truly effective organizing concept for guiding policy and action, the idea of sustainability must meet two criteria: Conceptually, it needs to offer major new insights to help visualize, relate and reassemble the various pieces of the development puzzle. Organizationally, it needs to offer the promise of enabling crucial coalitions to firm in order to create the power and will to carry out the strategies envisioned. How well does the concept of sustainability measure up to these criteria?

The Sustainability Vision

The idea of sustainable development is not yet formulated into a precise theory or even an approach, but is more an evolving vision representing the coming together of concerned individuals representing a variety of concerns, disciplines, interests and political pressures. Given this multiplicity of origins, the definitions of sustainability are many, depending on the nature of the problem addressed. Some, for example, are concerned largely with environmental protection, conservation of species, or resource management. Others focus on problems of financial solvency. Some

map out global trends and strategies, while others argue for self-reliant sustainability at the national or local level. Some approaches tend to be sector-specific, examining, for example, what appear to be the characteristics of sustainable agricultural systems, or energy use. Others conceptualize sustainability more generally in terms of human carrying capacity, or the maximum population size that a given environment or land area can support on a continuing basis. Sustainability can also be seen in terms of a society or culture, in terms of its ability to persist despite outside pressures, and some see it in terms of institution-building to improve local, national or even international "capacity."[1]

Policy discussions also use the idea of sustainability, with similarly inconsistent and potentially conflicting views or objectives. For example, many donors seem to define sustainability in terms of the willingness of recipients to take over financial responsibility for various donor-funded development projects and programs, while recipients, often burdened with debt, may see sustainability more as a problem of maintaining and even increasing the flow of external donor resources to avoid further reductions in living standards.

Part of the conflict may be explained as much by different interests as by different visions. For example, while an ecologist may see, from a global perspective, that the Amazon is part of world system to purify the air and conserve endangered species, the President of Brazil may regard it as part of the national patrimony, with any attempts at outside regulation regarded as a threat to the sustainability of the principle of national sovereighty. The Minister of Finance may see the rainforest as the part of the solution to financial sustainability, by promoting cash cropping or

logging to earn foreign exchange to pay the foreign debt. Meanwhile, the indigenous population sees the rainforest as the home where they sustain their way of life, while the poor nearby may see it as a source of land for subsistence farming. Wealthier individuals may see it as an opportunity for investments in cattle ranching or farming to preserve their life style, while the Minister of Planning and Minister of Defense may regard it as a relatively deserted space that needs to be populated and protected to sustain their borders and provide space for a rapidly growing population.

Given these differing views and interests, how effective is the sustainability vision at integrating issues and establishing priorities, forging consensus when possible and resolving conflicts when necessary? The embryonic nature of this vision makes any conclusions necessarily preliminary, but it is possible to chart what appear to be its emerging strengths and contributions, as well as some potential weaknesses.

At its most general level, the essence of the sustainability vision appears best captured in the Brundtland Report, which suggests that sustainable development should "ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." Much of the attractiveness of this vision lies in its holistic scope. While it does make the case that the relationship between people, the environment, and the transformation of nature must be placed closer to the center of any development approach, it also represents a sharp break with the previous "environmentalist" strategies. Instead of being a plea to include specific environmental concerns, the sustainability vision offers what amounts to a major reconceptualization of the development problem, to explain how such factors as environmental difficulties,

financial dilemmas, political issues, institutional change, and training strategies, interact to endanger or promote sustainability at all levels and across all regions and sectors. In the words of the Brundtland Report, "Ecology and economy are becoming ever more interwoven--locally, regionally, nationally, and globally--into a seamless net of causes and effects." The environment is not promoted as "a sacred shrine to be protected, but a collection of resources upon which all development is based." Effectively managing such resources is essential to future prosperity; or, put another way, "Sustainable development is not about making development environmentally sound. It is about making development developmentally sound."[2]

This holistic vision provides two important potential advantages. First, it helps to make more tangible the concept of "interdependence", with many of the studies of sustainability, guided by a systems approach based on some of the earlier ecological and global futures literature, providing specific examples of ways in which the world is indeed interconnected in innumerable essential and often unexpected ways. Equally important, the sustainability vision has begun to unite under one banner forces which formerly had often been in opposition. The sustainability perspective has managed to recast the environmental debates, so that many in the Third World now see environmental concerns to be as pressing as do the citizens of rich nations, if for different reasons. And in rich nations, such as the United States, the dramatic union of the development and environmental movements in the past few years clearly illustrates the extent to which such ideas as development, poverty alleviation, and environmental protection are now seen more as mutually reinforcing rather than as competing goals.

Within this effort to create a holistic, unifying vision, the sustainability approach is built upon several sets of concerns which serve both as critiques of present practice, and as priority areas that need to be addressed. First and most important, this vision stresses a new kind of equity--an "equity between generations." While it may seem to be commonsense that we should plan for the future, the essence of the sustainability vision is that we are failing to do so, and that our children will inevitably pay the consequences. Creating an appropriately future-oriented approach will require major changes, since it is widely agreed that decision-making in both the private and public sector presently tends to focus on immediate problems and short-term results rather than long-term benefits. A crucial problem, therefore, is to work to create institutions and incentives that encourage more long-term calculations, focusing for example not on maximizing present benefit, but considering, as the Iroquois have traditionally done, the impact of today's action upon the "sixth generation."

A second concern is that current development practice overemphasizes the ability of human beings to understand and control nature, when in fact there is a high degree of uncertainty about both the functions and value of the natural environment for the social system. Not only does the sustainability vision recommend more humility, but, more concretely, it makes two specific recommendations. First, given such uncertainty it is essential to maintain and enhance the "resiliency" of the system and its ability to adapt to unforseen circumstances and external shocks--or as one observer puts it, to "minimize regrets" rather than maximize output.[3] Central to this strategy is the maintenance of diversity of both the literal

and figurative gene pool, be it in crop varieties, institutions, or cultures. Second, this approach also cautions that the capital created by human beings may not necessarily replace all the functions of capital produced in nature. As a result, it cautions against the depletion of "natural capital" as leading to potentially serious and unforseen consequences.

Third, the sustainability vision expresses strong concerns that the market price system, as presently established, often seriously undervalues many items (such as the natural resource base) which are essential to support sustainable development. This concern has led to a variety of competing suggestions, ranging from moving towards a "freer" market to becoming more interventionist. However, the main thrust appears to be represented by the efforts of a variety of organizations, from the World Resorces Institute to the World Bank, to find ways to modify development practices or to change the national income accounts in order to reflect more accurately the true costs, including those that in the past have tended to be treated as "free goods."

Fourth, this approach also has a particular concern regarding the relationship of the poor, especially poor women, to the development process. While the concern with limits and carrying capacity does lead to a reawakening of a strong interest in the problem of population growth and its relationship to environmental degradation, the sustainability approach also attempts to go beyond "blaming the victim" for degrading environmentally fragile areas, and goes to considerable lengths to show how the reduction of poverty, population growth, and environmental degradation are complementary rather than competing objectives. Following this theme, the sustainability

vision remains cautiously optimistic, rather than Malthusian, in its prognosis for the future.

Finally, this vision also raises the concern that politico-military views of security and the national interest which tend to dominate current thinking are far too narrow. Future prospects for national prosperity and world peace, it is argued, will now become far more dependent upon "sustainability" issues, such as population, environment, and poverty, rather than on the balance of power or the composition of military forces. This new view of security and the national interest offers the opportunity for a fundamental rethinking of current strategies, permitting, for example, a serious analysis of major shifts of resources from military to development, justfied in terms of hard-nosed realities rather than utopian dreams.

Remaining Questions

The sustainability vision does appear to have considerable potential as an organizing concept. Not only does its systems perspective provide the possibility for relating a wide set of issues and problems over space and time, but it has brought together a broad set of interests ranging from environment and development to human and cultural rights. Equally important, it helps to place development issues front and center on the national agendas of rich as well as poor nations, by clearly revealing to the powerful their potential vulnerability as well as responsibility. But while sustainability has the opportunity to become one of those transendental terms which can serve as the cornerstone for action without

the need for further specification, it still seems that those operating under its banner are presently proceeding as if consensus exists, when in fact a number of questions remain unanswered. For the vision to continue to evolve, at least three areas stand out in need of attention:

First, while there is a general agreement that development and environment are mutually reinforcing, there is less unanimity about the issue of growth. The Brundtland Report, for example, argues that growth can continue in ways that enhance the environment, but this was a highly controversial point in the discussions. Further, it stands in strong contrast to other respected members of the sustainability movement who are far less optimistic that growth, at least as currently conceptualized, is compatible with sustainability. Resolution of this question is essential not only conceptually, but also politically; without the prospect of growth the development coalition becomes much less stable since it would need to face the uncomfortable prospect of recutting the pie rather than making it bigger.

This raises the second issue: what, exactly, is to be sustained? Scarcities require tradeoffs; further, all those advocating "sustainable development" are, implicitly or explicitly, arguing that some things (e.g. oppressive political systems, the status of women, the role of the market system) must be changed in order to promote sustainability. To what extent need there be consensus on such changes? For example, while most suggest that a basic goal is to sustain individuals, a minority would suggest that the goal is in fact to sustain the species which may require the sacrifice of some individuals. Further, most suggest that the diversity of traditional cultures is a good thing, but this is in direct conflict with

others who suggest that enhanced productivity demands a shift towards modern values and practices. Finally, most would agree that the sustainability should be above the level of bare subsistence, but how much above? Are levels of living of the rich nations still acceptable, or will some reduction be necessary to ensure the sustainat lity of others? If so, how can this be conceptualized in a way which allows the development coalition to continue with a broad base of support?

This raises the third issue. Who will make the decisions regarding what is to be sustained, and on what terms? Interdependence does not necessarily mean mutual benefit, and how decisions are made may have an important impact on the distribution of benefits and costs. The rhetoric of the sustainable development vision makes it clear that the poor should benefit, and an important part of this movement (e.g. the ecodevelopmentalists) explicitly emphasize the need for small-scale, self-reliant approaches. At the same time, however, the major events which tend to capture the imagination of the powerful and rich tend to be the global issues, which bring with them a sense of urgency that increases the temptation to apply macro-level "solutions" without the "luxury" of wide-spread consultation. But if the poor are cut out of the process, is there any guarantee that, rhetoric aside, the costs of change will not be increasingly shifted in their direction? What types of ideas and institutional processes need to be added to the vision of sustainable development to ensure that the poor are involved in more than name? One advantage of a multi-level systems approach characteristic of the sustainability vision would be to demonstrate that the active support of the poor is essential to the long-term success of any program. But how then

does one move from this to the creation of organizations and contexts to permit this to happen?

At this early stage there is no unified solution, but a number of promising avenues are being explored. One of the most important tasks is to be able to calculate more accurately the costs of present development strategies, based on the increasing understanding of the extent to which natural resources are limited rather than infinite. For example, the work to revise national income accounts currently underway in institutions such as the World Bank, the Conservation Foundation, and World Resources Institute needs to be continued and expanded. Furthermore, Americans need to become increasingly aware of the new realities of world interdependence so that we can make more enlightened policy choices. A variety of organizations, such as the Global Tomorrow Coalition, seem to be making a helpful contribution to this educational effort, and, judging from recent developments, the government does appear more focused on ecological issues than earlier in this decade. But in spite of new data, good intentions, and education, institutional changes to enable policy-makers to take a more integrated and long-term perspective are essential. In this regard, the interest of this Committee in the interconnection between Third World development and the U. S. national interest is a most encouraging sign, but this can be seen only as a beginning of a more fundamental shift if it is to have a profound effect. Finally, if the poor are to be considered in reality as well as rhetoric, it is essential that they be given more control and responsibility for their own situation--which requires major changes in the political structures of many Third World nations, as well as in some practices of international donors.

In summary, the mixture of local, national and world-wide crises we currently encounter provides both opportunities and problems for organizing a new development effort under the concept of sustainability. The general vision that is required to conceptualize all of the problems provides valuable insights, but it runs the two risks: that of over-generalization which is adequate for the rhetoric of conferences but less satisfactory as a guide to practical action; or that of paralysis in which the problems seem so interconnected and overwhelming that there appears no place to start Nevertheless, the vision of sustainability now provides us with the opportunity to place development, for the first time in years, back on the national agenda, to be treated as a major issue by an increasingly large and powerful set of interests. The challenge now is to extend this vision to ensure that it is not trivialized or, worse, used as one more way to legitimize the exploitation of the weak and vulnerable in the name of global interest and solidarity.

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1. For a brief description of some alternative definitions, see Becky Brown, et.al., pages 714-7.

2.Timberlake.

3.Goodland, p. 4.

Representative SCHEUER. Mr. Jolly, your timing was absolutely perfect.

We are delighted to welcome you here today.

Mr. Richard Jolly has served as deputy director of programs in UNICEF since 1982. And in this capacity, he's involved in UNICEF programs in over 100 countries around the world.

He's worked on UNICEF's strategy for child survival and development. He's participated in missions to Sri Lanka, Kenya, Zambia, and brings us a powerful message today.

We're very happy to have you here, Mr. Jolly. We'd ask you to take 7 or 8 minutes to make your positive case. Just chat with us informally. Your prepared statement, as prepared, will be printed in its entirety in the record.

STATEMENT OF RICHARD JOLLY, DEPUTY EXECUTIVE DIRECTOR, PROGRAMS, UNITED NATIONS CHILDREN'S FUND [UNICEF]

Mr. JOLLY. Thank you very much, Congressman Scheuer. My timing is not perfect because I wish I had been here and not in some other part of the building, being able to listen to Mr. Repetto, Mr. MacNeill, and Mr. Arnold.

I think, from what I have just seen, that Mr. Repetto has evidenced many of the themes that I will try to present briefly on behalf of UNICEF, closely related to this broader conception of the environment.

I have not chosen to begin with a formal definition of environment or a sustainable development, but to illustrate the important human dimensions of that by referring to some of the recent development experience.

Representative SCHEUER. Mr. Jolly, as a foreigner, you might be amused at an incomparable statement by a member of our U.S. Supreme Court, who told us that:

"He couldn't exactly and precisely define pornography, but he sure as hell knew it when he saw it."

Mr. JOLLY. Thank you. [Laughter.]

I won't ask for you to elaborate. I will though remark that when I was an adviser to the Parliamentary Committee in Britain on Overseas Aid and Development and I tried to get the distinguished American professor, Hollis Chenery, as a witness, I was told that, under British law for Parliament, the so-called Mother of Parliament, that there was no possibility of inviting a foreigner to give evidence.

I am honored that the American Congress takes a broader view.

Congressman Scheuer, thank you formally for this opportunity to appear before you this morning on behalf of UNICEF and to examine the links between the debt crisis, economic and human development, and sustainable development, including the state of the environment.

UNICEF's recent State of the World's Children Report, issued last December, states:

> For almost 900 million people, approximately one-sixth of mankind, the march of human progress has now become a retreat. In many nations, development is being thrown into reverse. And after decades of steady economic advance, large areas of the world are sliding backward into poverty.

Throughout most of Africa and much of Latin America, average incomes have fallen by 10 to 25 percent in the 1980's. The average weight for age of young children, a vital indicator of normal human growth, is falling in many of the countries for which figures are available. In the 33 poorest nations, spending per head on health has been reduced by 50 percent, and on education by 25 percent, over the last few years. And in almost half of the 103 developing countries from which recent information is available, the proportion of 6- to 11-year-olds enrolled in primary schools is now falling.

Representative SCHEUER. Excuse me, Mr. Jolly. I read a published report of UNICEF and I heard Jim Grant speak to the effect that these reductions in social service programs were for kids and for mothers—education programs, nutrition programs, family planning programs, maternal and child health programs—are the result of repayment pressures for that Third World debt, the interest and amortization payments.

Is this true, in your view?

Mr. JOLLY. In my view, it is certainly part of the cause, particularly in Africa and Latin America. It is not the whole cause.

The decline in commodity prices over the 1980's to levels as low as in the 1930's, is another important contributing cause.

The fact that AID has been growing only slowly in total is a further cause. Certainly the debt issue can be summarized in the phrase of President Nyerere:

Must we starve our children to pay our debts?

That illustrates the point.

Congressman Scheuer, what I'd like to underline this morning is the fact that these human setbacks imply economic consequences for the future and, thus, for sustainable development have double significance.

First, they represent a decline in human investment.

Second, they set in motion a process of environmental degradation, totally at variance with the priorities of sustainable development.

But I stress that investment in human capital in the form of nutrition, basic educational health for the growing child, is not postponable. It either takes place at an appropriate age when the need is present, or it does not.

For the young child, there is no second chance. Thus, the underemphasized tragedy of this disinvestment in human capital in the 1980's that I've described is that the results of this decay will be carried forward in the stunted bodies and deficient educations of the affected population well into the 21st century.

Similarly, on the side of environmental degradation, as the Brundtland report has illustrated in many ways, rising poverty reinforces environmental degradation as poor people and poor countries desperately put the urgent need for immediate survival above the priorities for longer term development.

In my prepared statement, Congressman Scheuer, I illustrate this in three major areas. And I will just touch very briefly on them.

The interaction between poverty and the environment leads to a downward spiral of degradation; whereas, the affluent pollute knowingly or thoughtlessly, the poor endanger the environment through necessity.

As the Brundtland Commission observed, those who are poor and hungry will often destroy their immediate environment in order to survive. They will cut down forests. Their livestock will overgraze grasslands. They will use marginal lands and, in growing numbers, they will crowd into congested cities.

The environment of poverty perpetuates itself starting with poverty-stricken mothers, overwhelmed by caring for large families, weakened by frequent pregnancy and lactation, rearing children whose basic needs of health, nutrition, physical and mental well-being remain unfulfilled and whose productivity when they reach adulthood will remain well below their human potential, thus, extending into the future, the vicious cycle of ill health and poverty.

I illustrate in the prepared statement how this is reinforced in many situations. I just returned last week from Madagascar where I have been several times over the last 25 years, and where we see this cycle reinforced now by the economic tragedies and leading to very severe environmental degradation.

Fortunately, I'm pleased to point out that the World Bank, with the support of a number of the other international agencies and bilateral agencies, is now making of Madagascar a test case in the protection of the environment with these human dimensions very much included.

Might I underline now a second theme briefly.

One of the approaches with the greatest potential for promoting environmentally sound development lies in empowering women in development in areas ranging from prenatal care and female literacy to income-generating activities, leadership training for roles in community development programs.

I'm conscious, Congressman Scheuer, that this is the Joint Economic Committee. I'm also conscious as an economist how often economists in the past have overlooked the vast range of women's contributions to economic activity of all sorts, because many of those contributions are not included in national accounts as currently constructed.

Representative SCHEUER. Considering that across the length and breadth of Sub-Saharan Africa, women do perhaps 75 to 80 percent of the food production as well as the food processing, anything that could be done to enhance the productivity of those women is going to have enormous economic implications for those countries.

Mr. JOLLY. I agree entirely.

Representative SCHEUER. Isn't that true?

Mr. JOLLY. UNICEF refers to the African farmer and her husband. [Laughter.]

The point I would be making is that these forms of support for women as farmers, food producers, household managers are the fulcrum on which rest both the well-being of children and the protection of the environment.

Just two sentences:

When soils become eroded or depleted, women have to work longer hours, walk longer distances to cultivate more distant fields. The more difficult it becomes to collect fuel and water or to cultivate marginal lands, the greater will be the need to use children, particularly girls, for these time-consuming tasks.

This, in turn, leads to girls either being withheld from the education system or dropping out of school very early. That is how the downward cycle of the environment impacts on human welfare, particularly of women and children.

I've illustrated in the prepared statement the other side also, which is how deterioration in the human situation then leads people to adopt practices that reinforce environmental degradation. Also, as is well known, deteriorating human conditions create conditions in which population grows most rapidly.

It is when there is progress, particularly women's education, opportunities and the empowerment that gives people the confidence that they can control their lives, that one finds people move to smaller families, adopt family planning practices or adopt other good health practices that have similar effects on slowing population growth.

Representative SCHEUER. Just to put a footnote on that, Jim Grant told me personally, and he has undoubtedly said this publicly, that as the pressures of Third World debt repayment plus the other factors that you mentioned press down upon the developing world countries to develop their social programs and family planning programs, education programs, job training programs and the like, then as that happened, their population growth accelerated as a direct result.

Mr. JOLLY. Yes. Would that these points were so well seen by the broader group responsible for support of Third World development.

Congressman Scheuer, let me end by underlining some of the conclusions for international policy. And if I might, with respect, some of the implications of international policy that I believe have direct implications for the policy of this great country. The four major conclusions that I draw on this, all relate to the point you, yourself, raised at the beginning; namely, the interaction between debt, declining commodity exports and prices, and the world economic environment.

I identify four basic conclusions for policy:

One, as a major player in the international development cooperation, the United States commands a particularly influential role in setting an example for promoting sustainable development. The U.S. bilateral aid policy already includes provisions for an assessment of environmental strength.

These could be further refined and strengthened, taking advantage of the heightened awareness and improved techniques of assessing environmental impact since the U.S. policy was originally developed.

The U.S. role as a member of the governing bodies of many of the international agencies, including UNICEF, is important in encouraging basic policy to take account of the environment in programs of sustainable development and support for children and women.

Second, there is a need to develop broader perspectives on the current debt and economic problems, especially in regard to Latin America and Africa.

The human and environmental impact of economic crises need to be incorporated as integral concerns of economic and financial

analysis, not merely as the residual goal of humanitarian and environmental agencies.

The third conclusion, international actions to tackle debt and adjustment need to be combined with measures for the protection and development of human resources, the environment and sustainable development, while economic adjustment and recovery are underway.

Increasingly, there has been recognition of this by the World Bank, the IMF, and other major financial institutions in a number of donor countries.

But, Congressman Scheuer, support for practical action at the country level still lags far behind declarations of commitment and needs to be greatly accelerated.

This process can be assisted by combining debt for nature initiatives with what UNICEF has called Debt Relief for Child Survival, or Debt Relief for Social Investment, to describe the program we have recently devised with the Inter-American Development Bank.

The idea of swapping or forgiving debt for humanitarian causes is gaining momentum both with creditors and banks and governments, as well as with debtor countries.

But, vision and leadership to make such schemes feasible by carefully interpreting or changing administrative procedures is now called for.

Fourth and finally, Congressman Scheuer, we need to go beyond adjustment with a human face. It must gradually give way to "development with a human face" in terms of the scale and objectives of the United States and international support through finance and technical assistance.

Support for human investment, nutrition, health, and basic education must become a priority with national and international action mobilizing around human goals through the 1990's with concern for environment and sustainable development as integral elements.

This should become a priority of bilateral aid donors, which, of course, has direct implications for U.S. aid. It also has direct implications for support by the United States to those international agencies which emphasize human investment, environmental concern, and sustainable development.

Congressman Scheuer, I offer my sincere thanks for this opportunity to present evidence on behalf of UNICEF.

I would be glad to answer any questions you may have.

[The prepared statement of Mr. Jolly follows:]

PREPARED STATEMENT OF RICHARD JOLLY

Sustainable Development, Debt, Children and the Future

Thank you, Mr. Chairman, for the opportunity to appear before you this morning to examine the links between the debt crisis, economic and human development, and the state of the environment.

Mr. Chairman, UNICEF's State of the World's Children Report, issued last December, states: "For almost nine hundred million people, approximately one sixth of mankind, the march of human progress has now become a retreat. In many nations, development is being thrown into reverse. And after decades of steady economic advance, large areas of the world are sliding backwards into poverty.

Throughout most of Africa and much of Latin America, average incomes have fallen by 10% to 25% in the 1980s. The average weight-for-age of young children, a vital indicator of normal growth, is falling in many of the countries for which figures are available. In the 37 poorest nations, spending per head on health has been reduced by 50%, and on education by 25%, over the last few years. And in almost half of the 103 developing countries from which recent information is available, the proportion of 6-to-11 year-olds enrolled in primary school is now falling."

In addition to having a serious humanitarian impact, these human setbacks imply economic consequences for the future of double significance: first, they represent a decline in human investment; second, they set in motion a process of environmental degradation totally at variance with the priorities of sustainable development.

Mr. Chairman, investment in human capital in the form of nutrition, basic education, and health for the growing child is not postponable. It either takes place at an appropriate age when the need is present - or it does not. For the young child, there is no second chance. The underemphasized tragedy of the disinvestment in human capital in the 1980s is that the results will be carried forward in the stunted bodies and deficient educations of the affected population, well into the 21st century.

Equally serious for the future, rising poverty reinforces environmental degradation, as poor people and poor countries desperately put the urgent needs for immediate survival above the priorities for longer term development.

When such investment in human and environmental capital is lacking, economic growth will be reduced at the cost of slowing future development in the countries affected. And the lack of growth in developing countries will have discouraging implications for the health of the world economy, including for the future trade and investment of this and other industrialized countries.

Sustainable Development Starts With Children

Children born to a malnourished, sick and illiterate mother who grow up in an environment marked by unsafe drinking water, unsanitary surroundings, the prevalence of such deadly and crippling diseases as diarrhoea, malaria, pneumonia, measles, polio and tetanus, and lack of basic education are bound to perpetuate the cycle of poverty and environmental degradation. Rapid population growth in such a situation exacerbates both poverty and the world's ecological balance.

Interaction between poverty and the environment leads to a downward spiral of degradation. Whereas the affluent pollute knowingly or thoughtlessly, the poor endanger the environment through necessity. As the Brundtland Commission observed, "Those who are poor and hungry will often destroy their immediate environment in order to survive; they will cut down forests, their livestock will overgraze grasslands; they will overuse margina lands; and in growing numbers they will crowd into congested cities". The environment of poverty perpetuates itself starting with poverty-stricken mothers overwhelmed by caring for large families, weakened by frequent pregnancy and lactation, rearing children whose basic needs of health, nutrition, physical and mental well-being remain unfulfilled and whose productivity, when they reach adulthood, will remain well below their human potential, thus extending into the future the vicious cycle of ill health and poverty.

The protection of children from the negative consequences of these "silent" environmental threats is a natural corollary to actions for dealing with the "louder" environmental emergencies characterised by industrial pollution, the greenhouse effect and the ozone depletion. In fact, lasting success in dealing with some of the louder environmental emergencies is very much dependent on improvements in the silent emergencies. For example, while the population explosion is often regarded as the root cause of many of the world's environmental problems, the historical pattern of demographic change in all nations shows that a sustained decline in birth rates is unlikely to be achieved without a sustained decline in child deaths. Programmes to reduce infant and child mortality are thus a prerequisite for reducing population growth and, therefore, of direct relevance to improving the environment.

As the concern for environment and sustainability of development is, to a large extent, prompted by our concern for our children's future, measures to ensure their survival, protect their health, inculcate relevant education and enhance their productivity should be the first item on an environmentalist's agenda. A family - or a nation - that is not able to protect its own children cannot be expected to protect the environment. A development programme that fails to address the basic human needs of the poor and vulnerable will not only be unsustainable, but it cannot be expected to elicit popular support and participation. Protection of the environment must, therefore, start with the protection of the most vulnerable element of the human environment - children.

We at UNICEF believe that the pursuit of child survival, development and protection is therefore a major contribution - in fact a pre-condition - for establishing an environment conducive to sustainable development. Once the basic needs of survival, development and protection are met, children as well as parents can be expected to be more sensitive to protecting the environment which nurtures and sustains the ability to meet such needs.

Protection of children and mothers from diseases that are directly attributable to negative environmental factors such as iodine deficiency, xerophthalmia, acute respiratory infections, malaria, diarrhoea, polio, measles, tetanus, guinea worm infestation, drug abuse, etc., contributes to the positive spiral effect of healthy children growing to a productive adulthood and an improved environment.

The consequences of not meeting the challenge of child survival and development (CSD) can be disastrous for the environment. We have already cited the dilemma of rapid population growth in developing countries - which is considered a major threat to the environment and which saps maternal energy, causes high infant mortality, pauperizes already poor families, further congests already overcrowded city slums, taxes the ability of Governments to provide basic social services and perpetuates the cycle of poverty - which cannot, according to historical evidence, be reduced without a sustained decline in infant and child mortality. Furthermore, reductions in infant and child mortality cannot be sustained in the absence of basic education, especially female literacy.

The promotion of child survival and development through primary health care, nutrition interventions, education and other measures is therefore one of the necessary pre-conditions for the protection of the environment. Child survival and development programmes have the added advantage of being low-cost and politically popular. UNICEF's experience with programmes for universal child immunisation, oral rehydration therapy, maternal and child health, water and sanitation, nutrition and basic education demonstrates that practical progress is possible. Given political will, vision and leadership, great strides can be made in a relatively short time with modest resources to improve the situation of children and thus lay the foundation for sustainable development.

Women's Role in Sustainable Development

One of the approaches with the greatest potential for promoting environmentally sound development lies in empowering women in development in areas ranging from pre-natal care and female literacy to income-generating activities and leadership training for roles in community development programmes.

The survival, growth and development of a child-to-be is influenced by its mother's circumstances and environment. A woman contaminated by toxins from her environment that have not been eliminated from her body at the time of conception has already set the seal of fate on her future infant. The consequences on the fetus of maternal malnutrition, anaemia, tetanus, acquired immunodeficiency syndrome (AIDS) and other diseases can only be dealt with through improved maternal health, nutrition and education services.

Where the mother's environment is one of poverty, nutritional and health factors take on major significance in determining child growth and development before and after the birth of the child. A deteriorating environment means harder work for women, less food and care for children and increased health hazards for both.

Women as farmers, food producers and household managers are the fulcrum on which rests both the well-being of children and the protection of the environment. When soils become eroded or depleted, women have to work longer hours and/or walk longer distances to cultivate more distant fields. The more difficult it becomes to collect fuel and water or to cultivate marginal lands, the greater will be the need to use children, particularly girls, for these

time-consuming tasks. This in turn leads to girls being either withheld from the education system or dropping out of school very early.

One of the most effective ways of improving the situation of children is, therefore, to improve the environment for women. Where population growth causes environmental pollution and degradation, addressing the problem through support for women's development is more likely to yield early and positive results. Anything that is done to improve food supply, decrease the work-load of women or improve their status and introduce them to community decision-making processes is likely to promote sustainable development.

Women's status, maternal and child health care, knowledge of child spacing, family income and level of education, are all strong determinants of family size. Improvement in the situation of women is therefore vital for reducing population growth and contributing to an improved human environment and to sustainable development.

Poverty, Debt and the Need for Human Concerns in Adjustment

A major reason today for the ongoing destruction of the environment is the international trap of poverty and debt in which many developing countries find themselves. Many countries, especially in Africa and Latin America, have little possibility of pursuing the "sustainable economic policies" recommended by the Brundtland Commission when, in order to pay their external debt, provide for essential imports and meet unavoidable budgetary obligations, they feel forced to deplete their forests, soil, water and other natural resources. 'Must we starve our children to pay our debts', asked President Nyerere, commenting on the desperate human and social cutbacks of austerity programmes introduced to deal with the debt crisis. Greater international effort to break this vicious cycle of the poverty of nations, as well as of the poverty of families and communities, is an essential prerequisite to preventing further environmental and human degradation.

As the international community strives to find solutions to the Third World debt crisis, UNICEF seeks ways in which debt reduction can be linked to human development and sustainable growth. In this context, UNICEF has proposed various measures of debt relief for child survival in Africa and debt relief for social investment in Latin America. The latter proposal is currently under preparation jointly by IDB and UNICEF. There are other similar proposals that merit serious consideration by decision makers involved in the Third World debt negotiations.

Closely related is the need for a broader approach to structural adjustment. Too often in the past, human concerns, environmental protection and sustainability of development have not been seriously considered in designing economic adjustment programmes. Their short-term focus has missed serious consideration of longer term impact. As a result, short-term adjustment programmes have often imposed the heaviest burden on the poorest segments of the population and reinforced environmental damage. Many recent statements and studies, including some by UNICEF, and increasingly by the World Bank and IMF, have recognized that it is both possible and highly desirable to design adjustment packages that protect the poorest families,

improve their productivity and incomes, protect their nutritional status and expand primary health care and basic education. Such programmes of "adjustment with a human face" should also pay particular attention to protecting the environment -- thus promoting sustainable development.

Possibilities for U.S. Leadership and Action

Based on the above, I draw four basic conclusions for policy.

1. As a major player in international development co-operation, the United States commands a particularly influential role in setting an example for promoting sustainable development. The U.S. bilateral aid policy already includes provisions for an assessment of environmental impact. These could be further refined and strengthened, taking advantage of the heightened awareness and improved techniques of assessing environmental impact since the U.S. policy was originally developed.

2. There is a need to develop broader perspectives on the current debt and economic problems, especially in regard to Latin America and Africa. The human and environmental impact of economic crises need to be incorporated as integral concerns of economic and financial analysis, not merely as a residual goal for humanitarian and environmental agencies.

3. The Brady Plan for Third World debt reduction has already elicited much interest and some action. International action to tackle debt and adjustment needs to be combined with measures for the protection and development of human resources, the environment and sustainable development, while economic adjustment and recovery are underway. Increasingly, there has been welcome recognition of this by the main international financial institutions and by a number of donor countries. But support and practical action at the country level still lags far behind declarations of commitment - and needs to be greatly accelerated. This process can be assisted by combining debt-for-nature initiatives with Debt Relief for Child Survival. The idea of swapping or forgiving debt for humanitarian causes is gaining momentum, both with creditors - banks and governments - as well as with debtor countries. Vision and leadership to make such schemes feasible by carefully interpreting or changing administrative procedures is now called for.

4. A focus on "Adjustment With a Human Face" must gradually give way to "Development With a Human Face" in terms of the scale and objectives of U.S. and international support through finance and technical assistance. Support for human investment - nutrition, health and basic education - must become a priority, with national and international action mobilising around 'human' goals for the 1990s, with concern for environment as an integrated element. This should become a priority of bilateral aid donors which, of course, has direct implications for USAID. It also has direct implications for the support by the United States to those international agencies which emphasize 'human investment', environmental concern and sustainable development.

Mr. Chairman, I offer my sincere thanks for this opportunity to present evidence on behalf of UNICEF before the Joint Economic Committee. I will be happy to answer any questions you or your colleagues may have.

Representative SCHEUER. Thank you very much, Mr. Jolly. We're delighted you made it here and we appreciate your fine testimony.

You talk of the need for more commitment, for more action to follow the rhetoric of the developing world.

I'd like to ask you and, indeed, the whole panel:

Is this a question of simple commitment, or do we need additional funding at the donor country level? Or, indeed, at the World Bank? Or regional bank level?

Do we need additional funding to make a reality of sustainable development?

Is it a simple concept that ought to rise or fall of its own weight, its own value? Or, does it need to make it a reality? And at what level should the funding come?

Mr. JOLLY. My answer, sir, would be threefold.

It needs certainly some additional funding if you set it in the broader context of debt.

But I think equally important it needs a new structure of funding toward the greater use of resources for clearer objectives relating to sustainable development.

Second, I think those clearer objectives need to be stated more clearly by all of the international organizations involved. They are creeping in, as I say, to the policies of the World Bank and the IMF on adjustment.

But, still, they are mostly additions to the core of economic adjustment rather than integral elements of a new approach.

Third, there needs to be clearer monitoring of the progress of these. I was pleased to see that Mr. Repetto drew attention to WRI's recent study on better indicators that would take account of environmental stocks as well as the flows of the national income that miss out on much of the human capital and environmental capital.

In UNICEF's experience, this monitoring enables a movement to management by objectives which we believe is every bit as important for all the international agencies as it is for good government.

Representative SCHEUER. Would any of the other panelists care to answer that question?

Mr. REPETTO. I think I would agree with Mr. Jolly that the answer is both. There's a great deal that can be done through restructuring. In the human resources field in most countries, public investment goes more to higher level education, higher level curative facilities rather than basic health education, health maintenance, and so on.

Resource use, much more investment in energy, for example, goes toward expansion of facilities and to improvement in energy efficiency.

The same is true of water. There's great underinvestment in forest maintenance and management and a great deal of investment in forest exploitation and reforestation after the forests have disappeared.

So there's a great deal that can be accomplished through restructuring, particularly in the poorest countries. There's a desperate need for additional resources that are being drained.

Representative SCHEUER. Mr. Repetto, you advocated changing the national accounting frameworks and institutions.

To what extent have you and others been successful in inducing developing countries to include environmental concerns and values in their national accounting systems?

Mr. REPETTO. A number of countries are interested and have started exercises in that direction. For example, we worked with Indonesia in doing this and they are interested in carrying on.

Representative SCHEUER. Did you offer them incentives?

Mr. REPETTO. Oh, no, no. Costa Rica is initiating a study. The Chinese, before the recent uprising and disturbance, had started studies.

Representative SCHEUER. How about Brazil?

Mr. REPETTO. Not yet. But there are a number of agencies in Brazil that are interested in this. In all these countries, it's interesting that the Ministries of Environment and Natural Resources are extremely supportive and interested, because they see this as a way of impressing the Economic Ministries that this is a mainstream economic issue and bringing it into the same framework of planning and policymaking that other important decisions are made within.

Representative SCHEUER. Mr. MacNeill.

Mr. MACNEILL. In answer to your question, Congressman Scheuer, I'd like to make three points. First of all, I was going to support what has been said by Mr. Jolly and Mr. Repetto. The industrialized world must increase by several orders of magnitude its level of funding for programs to preserve the ecological capital in the Third World and also to rehabilitate and restore assets that have already been depleted and destroyed.

There are several avenues through which we can work. Natural conservation strategies are being elaborated in over 50 countries. Most of them die for want of funding.

Tropical Forest Action Plans are being articulated in I think as many countries. They will require substantial sums to make them a reality.

Representative SCHEUER. What's the order of magnitude of the sums that would be required?

Mr. MACNEILL. We must stretch our thinking from figures in the millions to figures in the billions. I don't want to put a figure on it, but we're taking about substantial orders of magnitude of increase in funding for preservation, restoration, and rehabilitation.

That is the least important part.

I think that, second, the industrial world must take a very close look at its policies in the area of debt, and as we've already discussed, in the area of aid and of trade. As you know, beginning in 1982, the traditional transfer of capital from the rich world to the poor world was reversed. Today, the poor world is transferring to the rich world amounts on the order of $43 billion a year. And that's just what the World Bank counts. The Commission had a study done on trading patterns between OECD countries and the Third World. We found that, built into those trading patterns, was a massive transfer of the environmental costs of global GNP from the rich world to the Third World.

In other words, built into world trading patterns is a kind of ecological subsidy from the Third World to the OECD countries. We estimated that that subsidy amounted to about $14 billion a year.

That's more than one-third of the total amount of development assistance flowing in the other direction.

It's very important that we in the industrialized world take a close look at our trade policies. I think the trade departments should be asked to audit them against the criteria of sustainability. Are they encouraging unsustainable patterns of development in the Third World, or sustainable?

Many of them are encouraging unsustainable patterns of development in the Third World due to deforestation and all the rest of it. And I think they would find that they could be reformed in ways that both achieve their stated objectives and encourage more sustainable forms of development in the Third World.

I think that this whole area of restructuring and reform of economic policies that impact on the Third World is far more important than increasing funding for preservation and restoration. But, increasing funding for preservation and restoration is an absolute must.

Representative SCHEUER. If you were to devise a reforestation program for the developing world areas, I suppose you would have to reforest the Redwood groves that are being decimated as a result of this leveraged buyout on the west coast.

But, if you were planning a reforestation program for both tropical rainfall and for forest lands that used to be across the whole length and breadth of Sub-Saharan Africa, what kind of a price tag would you put on it? A sustained program over 10, 15, or 20 years?

Mr. MACNEILL. I can't answer that question. Before doing that, we need to do four things. First of all, in order to make our advocacy credible, I would carry through substantial reform of the incentive systems within our own countries.

In Canada, we are now cutting four trees for every one that we plant.

Representative SCHEUER. You're following the U.S. example?

Mr. MACNEILL. Exactly. That flows from the incentive systems that have been built up over the years and are reflected in our economic policies, in our tax systems, in our leasing systems, in a whole range of economic policy areas. The incentive systems literally make it rational for the managers of our forest enterprises to decide to overcut Canadian forests. We have to reform those incentive systems so that it makes it rational for them to make decisions that sustain our forests—and that can be done. And I think that has to be done.

As I understand it, here in the United States, you're about to subsidize the destruction of the Tongass in Alaska. If you want to improve your credibility, if we in Canada want to improve our credibility in advocating substantial reform in the Third World, I think we, first of all, have to correct those policies.

That's the first thing.

The second thing is increased funding for conservation programs and then, as Mr. Repetto and others have suggested, the third thing is to link forestation programs and policy reform to debt reduction and to structural adjustment programs sponsored by the World Bank of the IMF. I would make these linkages.

Then, fourth, I would ask our trade departments to undertake an audit of their trade policies to see how they impact on deforestation.

Representative SCHEUER. Supposing you met with the CEO's of the 15 largest banks in the world. You'd undoubtedly want to learn Japanese and schedule a meeting in Tokyo. All of the 15 largest banks in the world are Japanese banks.

Could you think of presenting them with a foreign aid program for the banks and for the Japanese Government that would include a rounded package of all the things that you've talked about? Five or ten billion dollars for global reforestation in the developed world areas? The requirement of some changes in the host government policies and programs to make sure that, from here on in, they harvested all of their natural resources on an environmentally sound basis, a sustainable yield basis?

Other structural reforms that would really put them on the track to sound economic development policies and programs, but did include sustainability as the key?

Mr. MACNEILL. I think that would be quite possible with or without the Japanese.

Representative SCHEUER. I have a sense that the Japanese are quietly searching for a constructive role in the global aid policies. They've already passed the United States as the No. 1 aid donor.

But, so far, their aid programs have been really an adjunct of their own economic development programs. They tend to encourage the sale of Japanese goods and services.

I think they're searching for a way of establishing a competent and creative aid program in their countries.

Mostly, they just respond to requests. They have a very, very small aid infrastructure. Low relationship of aid personnel to grants.

Perhaps some of us should put our heads together, put something together and quietly and informally send them a signal. Perhaps meet with them, here or in Tokyo.

Say: If you are looking for a way to expand your influence, if you are looking for a way to establish it on the basis of morals and ethics and humanitarian goals, if you want to create an improved face for your aid program, this is the kind of approach that could work.

I'm going to be in Japan in August and I hope to have some quiet, off the record, meetings with some of their government officials, MITI, that's the Japanese Ministry of International Trade and Industry, and their aid people.

Yes, Mr. Jolly.

Mr. JOLLY. In relation to the potential role of the Japanese, might I draw your attention, sir, to a study by Mr. Suburo Okita and Mr. La Jayawardene for WIDER—the World Institute for Developing Economic Research—in which they talked of a $25 billion program of recycling.

Mr. Okita you may know, was the former Foreign Minister.

Representative SCHEUER. Yes, I know Mr. Okita. He's a marvelous gentleman.

Mr. JOLLY. And as far as I know, this major program of recycling does not have an environmental element and one might easily ex-

plore that. It is, to my mind, the only program for recycling in relation to debt that is of an order of magnitude comparable to the debt problem.

Representative SCHEUER. Would you describe what you mean by "recycling"?

Mr. JOLLY. Yes. The purpose is, by a combination of a loan and some aid elements, to recycle some of the Japanese surpluses to developing countries, thereby providing support for Third World economies and a stimulus to the world economy as a whole.

It's comparable in that sense to a number of the other recycling proposals. The Overseas Development Council of Washington, in an earlier study, noted that recycling of surpluses by the Third World would have a markedly more positive impact on U.S. trade than if these surpluses were recycled simply within the industrial countries.

Representative SCHEUER. Yes. Mr. Arnold.

Mr. ARNOLD. One other thing. In talking about the sort of integrated approach that sustainability requires, when you're in Japan, it might also be useful to look at some of the trade practices and patterns, particularly in the area of the demand for wood, which is extraordinarily large in Japan.

In fact, if, on the one hand, it's pushing toward reforestation or environmental control and protection, on the other hand, the trade policies continue to demand wood products at this extraordinary rate, that these two, like in the United States, would be a very inconsistent set of policies.

I'm not saying the Japanese are alone in having inconsistent policies, but it's just one more example I think of how sustainability really requires a very integrated approach, going across a variety of different ministries.

Representative SCHEUER. I quite agree. It seems to me there's a real opportunity for Japan, perhaps with us in consort, to work arrangements, let us say, with Brazil, a long-term arrangement to purchase Brazil's forest products but with the requirement that that long-term trade agreement be on a sustainable yield basis.

And we should extrapolate into the long-term future under such a long-term purchase agreement, a constant flow of cash or an increasing flow of cash actually, but an arrangement that would preserve the basic resources producing that cash.

Yes, Mr. Repetto.

Mr. REPETTO. This is one of the reasons why we think it's a very good opportunity now if we could develop an international cooperative approach and put together an agenda and develop a set of programs and policies that address the ecological and growth needs for which there is consensus in the international community, to get financial support from the Japanese and from other bilateral conferences.

Mrs. Brundtland announced that the Norwegian Government would be interested in contributing an additional tenth of a percent of their GNP.

Representative SCHEUER. I think Norway is already contributing approximately 1 percent of her GNP.

Mr. JOLLY. For aid as a whole.

Representative SCHEUER. Which is about 2½ times the percentage of our GNP going into aid.

Mr. MACNEILL. Actually, more than that.

Mr. ARNOLD. Almost five times.

Mr. JOLLY. Four, isn't it, strictly?

Mr. ARNOLD. In the case of the United States I think, in the heydays of the Marshall plan 40 years ago, we contributed approximately 1 percent of GNP.

Mr. JOLLY. I'm sorry. We're all debating these figures, Congressman Scheuer. My understanding was it was for 4 years, 2 percent of U.S. GNP.

Representative SCHEUER. Under the Marshall plan?

Mr. JOLLY. Yes.

Representative SCHEUER. That was a noble period in American history. We haven't even come close to that since.

Mr. JOLLY. Although, as you probably know, one of the early strong environmentalists, Barbara Ward, called for a 20-year Marshall plan for the Third World.

And those sort of ideas were drawn on by the Brandt Commission.

Representative SCHEUER. This has been a remarkably interesting panel.

Are there any further remarks that any of you would like to make, because I do have some further questions if you can spare a little bit of time for that matter.

Mr. JOLLY. If there is a moment, I would like to make a comment on the importance of the national accounting issues that already have been raised.

To many people, national accounts may seem a rather technical operation, but I think it's important to emphasize that our whole perception of countries and particularly their economic health success or failure is enormously influenced by the limited number of statistics that emerge from national accounts.

Therefore, I think it's much more important than many people realize.

The second point I'd make is that the origins of the national accounting, at least in the modern 20th century sense, arises from the major social problem, not the economic problems, of the 1930's; namely, the social problem of unemployment and the need for a system of national accounts as we have them in order to tackle this major pressing problem.

Third, I think work, as Mr. Repetto has reported on, on the reform of national accounts is of enormous importance. Modest amounts of support in developing countries may be useful for this, particularly for countries like Africa, but even Latin America, where, with the current economic crisis of debt, the facilities and support for university staff is denuded so much.

In Ghana, for example, a major university, a professor earns the equivalent of one loaf of bread a day in terms of his monthly salary.

Paper to write on becomes a major difficulty. In these situations, to expect the creative research needed to work out new accounting, national accounting systems, clearly depends on some modest amount of support.

But, the fourth point I'd make is from a quote of John Maynard Keynes:

"The difficulty is not so much in the new ideas, but it's in breaking free from the old ones, which ramify into every corner of our minds."

There is no reason for national accounts to neglect environment.

We could revise the accounts. The time has come for this. As Mr. Repetto made clear, the U.S. position on the various statistical bodies of the U.N., which determines these things, is of enormous importance.

I have two further points if I'm not trespassing on your patience. These revisions of the national accounts should be part of something that UNICEF has also been calling for; namely, a greater use of social indicators in general in assessing the pattern of development.

Finally, we have through these reforms of national accounting an opportunity to mobilize the political and social support and understanding of ordinary people from which can then follow the political support needed to implement many of the things that we've talked about today.

And, at the moment, if issues opposed only in terms of economic national accounts, the ordinary person in the street often treats them as technical matters for the bankers and economists. If we can devise better indicators that make sense in human terms, the popular support already shown for environmental issues and sustainable development can be given a further focus for mobilization.

So I do feel these issues of accounting are of very much greater significance, even for mobilizing political support, than often is realized.

Representative SCHEUER. Well, I agree with you. But I do have a question.

How many of these requirements or preconditions can we load on to any one country before the list begins to fall of its own weight?

Is each one of them identifiable in and of themselves, how do we solve this conundrum? We want to lay on the countries the obligation of having environmental accounting. We want to lay on them the need to contemplate the role of women in development.

We want them to have the assurance of family planning programs so that women can control their fertility and achieve the number and spacing of their children, so that they can have access to education, they can have access to job training, they can have access to the world of work.

We want to lay on them involving people in the decisionmaking process who are going to be affected by these programs.

There are certain political structures that we want to change, certain economic structures that we want to change. The list grows endless.

By adding to each of these priority items, you finally lose any sense of priority.

How far do you go?

Mr. JOLLY. I would say a very long way because the issue to my mind is not just to add on additional elements but to restructure. And I believe in many of these areas, the restructuring will use existing resources—people's energies, people's vision, university stu-

dents, professors, the resources of statistical offices—in more creative ways than they're being used at the moment.

And it's this which to me makes these agendas not a whole pile of additional straws to break the camel's back, but a way of asking:

Which direction should the camel be walking in?

And, can we not off-load some of the irrelevance that the camel is bearing at the moment?

I really do believe that.

One is not saying are we going to add a whole new set of burdens if we involve and give people opportunities so there is empowerment. Then, a whole release of energy can follow.

I think that can be so even for statisticians who, at the moment, are spending a lot of time, enormous amounts of time, in boring, repetitive work to calculate the difference between 1.8 or a 2.1 percent increase in GNP. A focus on the more human dimensions of the country and society, I think would be enlightening.

Representative SCHEUER. Yes, Mr. Arnold.

Mr. ARNOLD. Just following up on that, I would certainly support the idea that it's restructuring that's needed. It also means that there has to be restructuring here in the United States.

The most obvious example is that the AID program currently has 33 or 34 first priorities, as I recall, which exactly speaks to your question of how in the world can one possibly do all of these things?

Policy simply grows by accretion and, as a result, if you have an environment or sustainability or accounting on top of that, then people get pretty cynical and say, "Well, this is just one more form to fill out in our project cycle," and really don't take it with the seriousness that is required.

In another part of Congress at the moment, of course, AID has been going through some fairly intensive hearings about the restructuring of foreign aid programs.

But, again, this demonstrates the idea that things are going on in sort of separate compartments when the program is really an integrated issue.

And the real challenge I think for all of us, and I don't think anybody has a good answer yet, is how do you try to put together the integrated approach that the Brundtland report calls for?

And, yet, we are working very much out of isolated rooms in different places without a whole lot of communication together.

Representative SCHEUER. Especially when our AID organization has so few people trained in environmental matters.

Mr. ARNOLD. Absolutely.

Representative SCHEUER. How do we get AID to have a sufficient staff of people who are trained in the environment, not just development economists. But, people who can factor in these environmental concerns, so that we can make real these concerns and make real these priorities that Mr. Jolly has just enunciated.

Mr. ARNOLD. Part of it comes down to I think the issue of priorities again. And I don't think there's a very clear direction coming out of the U.S. Government as to what the priorities for AID should be.

Second, it clearly gets back to your question of money. Now, there are different ways you can retrain people or you can rehire, but I think even before that is more of the restructuring question.

Representative SCHEUER. Yes, Mr. MacNeill.

Mr. MACNEILL. I would just like to reinforce what has been said. I think, Congressman Scheuer, as long as you take economic trade and AID policies as a given, you are faced with the phenomenon that you described so well. You have to add on all of these other concerns—environment, women, and so on. The power of the sustainable development concept, as we saw it, is that it integrates these concerns with economic policy itself.

And I think that's also the importance of modifying our economic accounting systems to reflect resource and environmental stocks and other considerations. If we can build these into the way in which we measure growth, then economists in OMB and Trade and other line departments—central economic departments that advise on economic policy—will, as a matter of course, be taking the environment into account, taking women into account, taking the other things into account. And they will no longer be add ons, impossible add ons. They will be part of the whole economic policy, trade policy, AID policy, and development process.

That really is the only way to make it work. If we don't do that, we get paralysis by add on, cynicism by add on, and all the other things we are familiar with—by add on.

Representative SCHEUER. Mr. MacNeill, what are the economic implications to the recipient country, to the Third World country, or perhaps even a Fourth World country, the poorest of the poor?

Are they able to take steps to implement effectively each of these bullets in a whole long list of bullets?

Are they able to take steps to implement a professionally prepared program of sustainable development?

Do they have the infrastructure or competence to respond to these criteria that we all agree are important and should be made real?

Mr. MACNEILL. That's a very difficult question. I think that some of the larger developing countries have a very large pool of professional support that they can draw upon—countries like India. That pool of support has to be marshaled. Whether the countries can do so and address these issues is clearly an open question.

It think it is the responsibility of the industrialized world, through a process of programs that we mentioned earlier, to make it possible for them to begin to address these questions. And over a longer period of time, we can, as I said a moment ago, build these considerations into the whole process of economic policy formation and trade policy formation.

Then it will happen. But I think, in the short run, the responsibility is largely on the industrialized world through the kinds of measures we've been discussing to make it possible for Third World countries to address these issues.

Representative SCHEUER. And provide the professional aid to them and a lot of hand holding, walk them through the process.

Mr. MACNEILL. And set an example ourselves.

Mr. REPETTO. It doesn't really enlighten the subject to sort of lump all Third World countries together with respect to the availability of trained people and functioning institutions.

At one extreme, we have India, which is supplying us a large percentage of our trained people manning most of our institutions.

And on the other extreme, we have countries with very few technically trained people at all. And a whole spectrum in between.

So, clearly, the fundamental point is that institution building and human resource development is a large component of the development process.

Representative SCHEUER. Yes, Mr. Jolly.

Mr. JOLLY. Granted that the picture I had is that most developing countries in Africa and a good number in Latin America today have the predicament that they're not being able to use many of the highly skilled professional people that they have.

Representative SCHEUER. Their own nationals?

Mr. JOLLY. Their own nationals. And in that sense, we've moved backward over the last 10 years as the consequence of the severity of the economic crisis dent, and so forth.

I can illustrate, just having been in Tanzania, I think I already mentioned the salary of a Ghanian professor, 30 loaves of bread.

I found the same in Tanzania. But I found also that the total amount being spent by the international community bilateral donors on technical assistance was $300 million a year, mostly, at least two-thirds, $200 million on salaries and travel and per diems of the technical assistants experts of developed countries, provided because the theory is that the Tanzanians can't cope.

When I tell you, as I learned from the World Bank man, that the total salary bill of every Tanzanian civil servant, including the university staff, the teachers, the health workers, everyone, amounted to only $100 million last year, half of what this handful of technical assistance people were getting, you then begin to understand why most of the competent Tanzanians have too little incentive to spend most of their time doing the tasks for which they ought to be paid. They are desperately struggling to get the food and other things to survive.

The conclusion is that those countries so hard hit by debt and adjustment need to find ways to get back to reasonable incentives and reasonable levels of pay. Until this is done, there will not be the conditions and the opportunity for nationals to use properly their skills and talents. And we will be in a mad, downward cycle of thinking that.

The only way we can help is to try providing yet more technical assistance, at $100,000 plus per international expert.

I feel this is of very fundamental significance for the whole of the international technical assistance effort.

How can we help people really tackle their own problems with the skills and resources that now are so often there?

Representative SCHEUER. When you talk about helping people really tackle their own problems, you talk about the need to help them fulfill basic human needs.

Is there a problem out there that developing countries are more interested in wildlife and trees and flora and fauna than they are in people?

And, if so, how do we relate our concerns with wildlife and flora and fauna and tropical rain forests to the well-being of their own people?

Mr. JOLLY. I think by following the perspectives of the Brundtland report that showed very clearly that you could not preserve biological diversity unless it was part of tackling human poverty and sustainable development and the environment in a broad sense.

Representative SCHEUER. Mr. MacNeill, tell us exactly what impact the Brundtland report has had on developing countries? Has there been sufficient interpretation by you and others like you to professionals in the developing countries to make these concepts real, meaningful, and relevant to them? Is it playing the role in changing policies and improving programs?

What is the fallout of the Brundtland Commission's report? It was so heralded and so welcomed in the developed world.

Mr. MACNEILL. I think it has been quite significant when you consider that the report has been out for only 2 years. These things take a little time.

After we presented the report in London in April 1987, we met with the heads of over 100 governments. We met with the heads of virtually all the governments in Africa through the OAU and through other channels, and many heads of government in Latin America and Asia, as well as in North America and Eastern Europe. In doing that, we not only brought these concepts to the attention of heads of government, but to the bureaucracies that support them, because the head had to be briefed for their sessions with us. I think that has had a very significant effect.

More specifically, I would say that, at the moment, in Asia, the response to the recommendations in our report is being led by Indonesia and India with some other countries coming up behind.

In Africa, I think the lead is with Zimbabwe. In Latin America, it's really too early to say because the report has just recently come out in the Spanish language edition.

In North America, I think, although perhaps I shouldn't say this, it's Canada and in Europe, the Scandinavian countries and the Netherlands.

But, some other European countries, Western European countries are coming along quite rapidly.

President Mitterand has stated repeatedly that the report and these issues will be at the top of the agenda at the forthcoming economic summit in Paris.

The U.K. Government is the second European government to come out with a formal response to this report with its own report titled "Our Common Future, the Official Response of the United Kingdom Government." And it deals with our recommendations chapter by chapter, with a foreword by Prime Minister Thatcher.

Representative SCHEUER. Could we have a copy of that response to include in the record?

Mr. MACNEILL. Of the United Kingdom Government? Yes.[1] You may also want to get the one of the Canadian Government, the

[1] The report titled "Our Common Future, the Official Response of the United Kingdom Government," may be found in the subcommittee files.

report of the National Task Force on the Environment and the Economy. Right after our report came out, they established, the Canadian Government established a National Task Force on Environment and the Economy, made up of not only Ministers from our two levels of government, but also the chief executive officers of seven of our top multinationals.

They brought in a really wide-ranging set of recommendations for a Canadian response. And I was very pleased that they addressed the key issue of how do you merge environment and economic decisionmaking in government and in industry. So you might want to include that in your record.

And the Norwegian Government has come out with two reports. One is a kind of foreign policy, at least the beginning of a foreign policy, for environment and sustainable development. It's a small, blue book.

And the second, more recently, is a white paper which sets up their domestic response to our recommendations.

And the Netherlands Government has just recently come out with a report as well.

I have copies of those. You may be able to get additional copies by contacting the Embassies of those countries in Washington.

In the case of Indonesia, back to the Third World, in the case of Indonesia, the Indonesian Government is currently articulating its seventh economic plan. And it is building this whole concept of sustainability into its seventh economic plan.

In the case of Africa, the African Development Bank has taken it up in a systematic way; and coming back to Asia, the Asian Development Bank is beginning to pick it up as well.

So I think that the response, considering that it has been out for only 2 years, has been very significant.

In addition, I could say that the report is now firmly on the agenda of the United Nations General Assembly. They have made decisions that will require them to come back to it every year for the next several years.

It's firmly entrenched on the agendas of many specialized agencies, from UNICEF through UNDP and others.

Representative SCHEUER. Financing agencies of the World Bank?

Mr. MACNEILL. I was just going to come to that. I think it also has had a significant impact on the World Bank. And some of the regional banks. I mentioned the African Development Bank.

Representative SCHEUER. That's very, very encouraging.

Mr. MACNEILL. Someone on the plane last night, a senior official from your government, said to me that: Sustainable development has become an "idée-fixe." When he goes to meetings, sustainability emerges as a criteria for the discussion. And I think that's important.

Representative SCHEUER. They say there's no army on Earth that's powerful as an idea whose time has come. And what I think you're telling me is that, among professionals, government leaders, and decisionmakers around the world, the idea of sustainability as a measuring rod by almost any development program, that time has arrived. That idea is here.

Mr. MACNEILL. You mentioned professionals. I could add that a number of universities are developing either special programs on

sustainable development or they are making sustainability a kind of the overriding theme against which to test all of their programs in agriculture, engineering, architecture, economics, you name it, and business administration. My institute in Canada has recently brokered a new program on "business and sustainable development" with the University of Western Ontario School of Business Management. It follows the Harvard method, the case-study method. Over the next couple of years, they will be developing a whole range of case studies of business and sustainable development to use in their teaching program. I could name other universities in North America, Europe, and Australia that are beginning to do the same thing.

Representative SCHEUER. I suggest to you that the worst case in that case book could be the study that we saw either on "20/20" or "60 Minutes" about 1 week ago of a New York financial group, as I recall, that engaged in a leveraged buyout of a company that owned vast stands of California redwoods.

And in order to meet the debt service involved in the leveraged buyout, where you are working almost entirely with borrowed money, they had vastly to accelerate the rate at which these forests, these magnificent 500-year-old redwoods were being decimated.

The executives claimed that they were harvesting on a sustainable yield basis, even though they have significantly increased the scale and the rate of cut.

But they interviewed, right on television, they interviewed staff, and they showed the bills of lading that indicated that it was impossible to cut on that basis without absolutely wiping out the resource.

They predicted that, within 10 years, the resource would be gone. That could be a worst case study.

Mr. MACNEILL. That is one of the tragedies of the whole debt scene. We analyzed those linkages to some considerably extent in this report.

Representative SCHEUER. Yes, Mr. Arnold.

Mr. ARNOLD. Can I just add one thing?

I think it's very salutary to hear about the public interest around the world in the Brundtland Commission report. I think it makes me even more uneasy that the amount of interest that has been expressed in the United States, particularly on the Brundtland Commission report, has been much less strong.

I don't know whether Mr. MacNeill would agree but it seems to me that the United States has not been among the leaders in taking the report very seriously. Certainly, not the U.S. Government.

And it's even very difficult to find "Our Common Future" in bookstores. So, if you are trying to get people aware of these issues, the United States for some reason seems to be way in the background rather than in the front.

It might be interesting to inquire as to why that might be the case, particularly since so many other countries in Europe—not only in Europe and the Third World but around the world—are interested.

Representative SCHEUER. When we wanted some copies for the members of this subcommittee for the GLOBE legislative organization, we couldn't find it in the stores. We had to order them specially from the publishers.

Mr. ARNOLD. The GLOBAL Tomorrow Coalition, for example, has been trying to get some out to people. But, for some reason, it doesn't seem to be a thing you can get. You can get "Satanic Verses" everywhere, but for some reason, you can't get "Our Common Future." [Laughter.]

Mr. MACNEILL. Maybe we ought to title it "Our Satanic Future."

Representative SCHEUER. It's a common future everywhere outside of the United States apparently.

Well, Barber Conable, president of the World Bank, this is the last question that I want to offer you here, is being the guest speaker this evening at a dinner sponsored by the World Resources Institute, the organization that Bob Repetto is head of and has shown such remarkable leadership of.

If each of you had a chance to make a brief statement and/or ask a brief question to Mr. Conable, what would it be?

I'll ask Mr. Repetto.

Mr. REPETTO. I think the question that I would like to get Mr. Conable to answer is how to permeate that organization with a sense of commitment to the importance of the issues we've talked about today.

Representative SCHEUER. Sustainability.

Mr. REPETTO. In their project design and in their policy dialog and policy lending, in their institution-building activities, how to prevent the compartmentalization of the environmental concerns that seems to be already taking place after the creation of an environmental department within the World Bank.

Representative SCHEUER. Repeat the last part of that sentence.

Mr. REPETTO. The World Bank, what, a year and a half or so ago, created a new environmental department. This was taken by all of us as a hopeful indicator of their concern and commitment.

The question now is how to prevent environmental issues from being compartmentalized within the World Bank and becoming another add on.

Representative SCHEUER. Instead of being factored into each and every grant decision, program decision, lender decision of every description.

Mr. REPETTO. In every country that they deal with.

Representative SCHEUER. That's a great question.

Yes, Mr. Jolly.

Mr. JOLLY. In different words, I would have made exactly the same point, but particularly focused at the moment on the economic adjustment programs.

The question would be:

How can we make human and sustainable development an integral part of the adjustment programs, not merely an add on.

Could I illustrate how the Canadians did this? With respect to women's issues, I have found this in UNICEF a very, very important example. When I was asked on the UNICEF board by the Canadian Government: What is UNICEF's implementation strategy for getting women's concerns made an integral part of all UNI-

CEF's programs and not an add on? I didn't understand what they meant by implementation strategy.

But, later, I found out that when, several years ago, CIDA did the same with respect to women's issues, they created for every department within CIDA a formal program of discussion and investigation as to what would it mean for that particular department or division to integrate women's concerns into every part of their work.

This covered not only the main programming areas, but the training units, the audit units, the accounting, public relations, and so forth.

The groups were set tasks and were required to produce reports. The whole process stimulated some very exciting, lively discussions, because there was a sense of unison and challenge.

Then these reports were assembled together and considered further.

Then, having been brought together, the process again worked down to the various levels and, eventually, resulted in guidelines for the work of all the different departments including responsibilities for implementation and monitoring systems to ensure implementation.

The incorporation of human concerns and sustainable development into adjustment policy is the major economic problem of the developing countries at the moment—but will not take place without some form of implementation strategy.

Representative SCHEUER. Yes, Mr. Arnold.

Mr. ARNOLD. My question, I think, would be as to how the World Bank can work more effectively with the poor to enable the poor to take the responsibility and the tools for their own development.

I think, if you look at the Brundtland report, if you look at some of the things that Mr. Repetto has been writing, and a variety of the things that Mr. Jolly has been putting together, you find that the poor are the ones who are most intimately aware of their relationship with their resources. And, yet, oftentimes, they don't have either the power or the control or the land tenure to actually be able to act in their own best interests.

And one of the important issues is to try to figure out how to allow those people at the bottom, working with other small organizations, to make sure that they do get the power to be able to act in their own best interests. I think they're beginning to work in that direction, but that would be an interesting issue to continue to monitor.

Mr. MACNEILL. I think I would, given the opportunity, Congressman Scheuer, ask Mr. Conable what the World Bank and IMF are doing to ensure that structural adjustment programs and sectoral adjustment programs encourage forms of development in so-called recipient countries that are sustainable.

If the answer is that they're not at the moment doing anything, I would ask them why not. And I would urge them to put a team to work to develop programs and policies to reflect the structural adjustment programs that would have that effect.

Representative SCHEUER. Well, now we have arrived at the 2½-hour mark. We're very grateful to you. This has been a tremendously instructive hearing.

I want to thank all of you, and the hearing is adjourned.

[Whereupon, at 11:55 a.m., the subcommittee adjourned, subject to the call of the Chair.]

SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH IN THE THIRD WORLD

THURSDAY, JUNE 15, 1989

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:40 p.m., in room 2359, Rayburn House Office Building, Hon. James H. Scheuer (member of the subcommittee) presiding.

Present: Representative Scheuer.

Also present: Frankie King and Orhan Yildiz, professional staff members.

OPENING STATEMENT OF REPRESENTATIVE SCHEUER, PRESIDING

Representative SCHEUER. Today we are having the second day of 3 days of hearings on the subject of Third World debt and the implications of the present system of debt repayment to the desired goal of sustainable development. What are the implications of our current Third World debt as a system to the possibilities of well-being and sustainable development in the Third World?

We have four superb witnesses today: Ms. Barbara Bramble, program director of the National Wildlife Federation, who has worked with us and advised and counseled us in the past; Mr. John Sewell, president of the Overseas Development Council, who is a wonderful friend and adviser and counselor, and has assisted us on so many occasions that it is almost embarrassing; Mr. Richard Bissell, Assistant Administrator of USAID—we are delighted to have you here, Mr. Bissell; and William Dale, member of the board of directors of the Marine Midland Bank.

We are really very pleased to have you all. Your prepared statements will be printed in full in the hearing record.

What I would suggest—you are each going to get 10 minutes for your testimony, and then, of course, we will have some questions for you. What I would suggest, when you testify, is just relax, we are all in the living room together, and just chat with us informally. And do not hestitate to take into account anything you have heard from me or the other witnesses up there.

So with that, why don't I take you in the order in which you are sitting. Ms. Barbara Bramble first, program director of the Wildlife Federation. Please take 10 minutes, and chat with us.

STATEMENT OF BARBARA BRAMBLE, PROGRAM DIRECTOR, NATIONAL WILDLIFE FEDERATION

Ms. BRAMBLE. All right. Thank you very much, Congressman Scheuer.

I am glad that you have invited us to do that. I have a paper to submit for the record, but not a specific prepared statement, so this will work very well with my need.

I have been working on the problem of debt, natural resources in developing countries for over 3 years, and I am extremely pleased that the set of issues has received the point that it has, and I am very grateful to you for holding these hearings to advance them further.

When I first started to confront the question of debt, the reason was because we had been working for years on a campaign that you know very well, on the reform of the multilateral development banks from the environmental and natural resources point of view. And we were making some progress in inducing or suggesting, recommending, pressuring institutions to add environmental staff, environmental criteria, to loans, to examine the impacts of loans on the environment, and the impacts of the environment on the loans themselves and their actual outcome.

We had a lot of evidence of that sort of thing, and progress was being made in improving loans, specific loans for specific projects. But we found that that was not really addressing the problems that most developing countries were facing.

Really, you have an image of us standing there, all of us, with our good little projects and our great ideas for sustainable development, and we are going under a tidal wave of the debt.

So the whole campaign was shifted a bit. We started looking at the effects of structuring adjustment itself on the natural resources that are so important for sustainable development.

Representative SCHEUER. You are going to tell us what that tidal wave is doing to us?

Ms. BRAMBLE. Yes. I do not have a lot of detail about it, because in fact it has not been studied from that point of view.

It has not been studied in that way by scientists in the field working for years. But the equivalent, the analogue to that, I believe was presented to you by Mr. Jolly, for example, in looking at what has happened to vulnerable groups, to the poor, to women, to children, in developing countries under the same circumstances. And all of the same things are happening to the poor, to those who depend on natural resources.

There are no good statistics on what has been going on with deforestation for the last 20 years. We are just finding out now how to use LandSat data to find out the current situation of rates of deforestation. Similarly with soil erosion, similarly with fisheries measurements—what is really happening to habitat of fisheries, which is more important than the catch from one year to the next.

So, we are not very well set up to give you a 20-year profile of resources becoming more endangered because of the debt, that we could prove, tie, and otherwise put together a case, except with anecdotes. There are many situations in countries all over the world, where people will tell you of entire towns where the unem-

ployment rate has skyrocketed because of the recession, because of the need to pay the interest and the contraction in the economy. You now have 100,000 people heading for places in the countryside seeking fuel wood, seeking a place to make a small garden, urban areas where they actually had jobs.

There are cases in Rio de Janeiro where hundreds and hundreds of thousands of people, living on hillsides in really sad slum conditions, are pulling the mountainsides down on top of them, because they are building in places they should not be. There are, I am sure, zoning rules about this sort of thing, but there is no other area within these urban areas where they are trying to live, except very steep slopes. And those slopes are washing downhill with them, on top of them, and hundreds of people were killed last year in Rio very tied to their living place.

The reason that they are there has to do with the whole cycle of the debt.

A couple of examples from Brazil also might be useful. The southern area of Brazil is a breadbasket, very equivalent to ours. It has been a region of mixed farming, with many small farmers making a living either owning their land or working land.

Over the last few years, under the tutelage of outside experts, many of these acres have been turned into soybean monocultures—very efficient for production. It is wonderful farmland, and it is producing, as expected, a tremendous amount of soybeans for export.

Well, that has complications for the United States. I am sure there are many people, soybean farmers, who are worried about that here. The competition, and everyone needing to export more and import less results in competition in ways that come at us from our farm states, and then come at us from the problem of deforestation in Brazil. Because all the people who used to be farmers in the south of Brazil are looking for somewhere else to live. They have been thrown off their land, or disemployed by the mechanization of the soybean farms. And those are the majority of the people who are colonizing western Amazonia.

There have been surveys done. That is where those people come from. The rest of them are coming from the northeast, who have a similar cycle of increased poverty in just the last few years. They are, again, moving west, trying desperately to find a place to live.

Representative SCHEUER. Are you familiar with the statistics that Jim Grant produced for UNICEF of the impact of Third World debt on social programs?

Ms. BRAMBLE. In general, not the specific numbers. But there, they had data having to do with actual measures of infant mortality, of literacy, of nutrition intake. Those are measurable, because they actually had those figures from before.

The problem in the area that I work in is that we did not have very good data from 20 years ago, from 15 years ago, and there is not much that we can compare it to.

But we do see forests going up in smoke. We do see the impact of farming in northern Mexico, for export, again—this is all for paying the debt—which is having a tremendously negative impact on water resources, in a very dry region.

Northern Mexico, again, is reasonable farmland, but irrigation is bringing up deep water, and the water table is dropping, fast. So they are forced to take a short-term look at what can earn money in the next 6 months to a year to two years, and not worry about what that region might be good for 5, 10, 20 years down the road.

I have friends who live in developing countries all over the world, some of whom are teachers, some of whom are in government agencies and in environmental groups. And they are telling me of the general effects of the debt, on them, on their families, because of the cycle of restrictive fiscal policies by governments trying desperately to gather enough money to make interest payments.

We are really looking at a situation in general which has this specific impact on natural resources. Social programs are going down the tubes: hospitals, personnel who work in hospitals and schools leaving, transportation systems. All of these long-term developments that have been painstakingly built up over the years are being dismantled in front of our eyes.

Representative SCHEUER. Because of the pressure of Third World debt on those governments?

Ms. BRAMBLE. Because of the pressure to reduce the government budget itself, and to accumulate cash, hard currency, under various scenarios to pay the debt.

Now, a lot of countries are not fully paying, and they are still struggling. So it is not a question of meeting the payment every 3 months and having these problems; in many cases, even without meeting the payment they are now in a situation of what looks to be permanent recession. And there is going to be required something fairly major, really drastic, in terms of restructuring the economy in positive ways, instead of negative ways, which is what has been pushed for the last 8-or-so years, in order to bring them back to a situation where they might be growing and looking toward a future.

Our country does not practice sustainable development very well, so it is a little tough for us to be preaching it to other countries. But we do talk about it a lot, and we encourage it, and we talk about loans for it, and we talk about projects for it.

But we take it all away again when the policy of our Nation is against debt reduction in a situation that is so serious, as has been described to you, I am sure, before.

Representative SCHEUER. When the policy of our nation is against debt reduction?

Ms. BRAMBLE. Well, it has been up until Mr. Brady's plan. And Mr. Brady's plan is not producing debt reduction yet. So I would be very interested to see how it goes.

Representative SCHEUER. Do you mean reduction in Third World debt payments?

Ms. BRAMBLE. Yes, reduction in the overall debt, and reduction in the interest payments immediately.

Representative SCHEUER. OK.

Ms. BRAMBLE. Both.

Representative SCHEUER. Because "debt reduction" could refer to debt amortization. You see? So that was a little——

Ms. BRAMBLE. OK. I mean "debt reduction" in terms of reducing principal and reducing interest rates on the remainder.

It seems to me—and the two main points I want to make—I think that all of us, "all of us" meaning me as a taxpayer, you as a legislator, we as a country, us as an industrialized nation and our banks, but then also the developing countries and their governments—share the blame for the mess that everybody is in.

I am not going to allocate it. It could not be allocated. There were negligent lending decisions. There were negligent and unrealistic and perhaps corrupt borrowing decisions. There were U.S. decisions in terms of our own domestic economic problems in the early 1980's, specifically interest rate changes, that were meant for us but affected the whole world.

There has been bad project advice given and taken by outside experts and by builders in developing countries, so that a whole lot of money has been wasted on megaprojects, "pharaonic projects," as they call them in Brazil.

Representative SCHEUER. What kind of projects do they call them?

Ms. BRAMBLE. Pharaonic, as in the Egyptian pharaohs.

Representative SCHEUER. Pharaonic projects.

Ms. BRAMBLE. Yes. Quite an extraordinary image, but very true in a lot of cases.

Representative SCHEUER. That is a case of the pot calling the kettle black.

Ms. BRAMBLE. Well, exactly.

Representative SCHEUER. I cannot imagine a greater pharaonic project than their new capital, Brasilia.

Ms. BRAMBLE. Oh, I know. But the decisions about who was making those are of great importance to the people of Brazil. I mean, the identity of who was making those decisions is, of course, a great question of dispute in the process of democratization which is going on there right now.

We have a situation in which the people of Brazil are asking, "Why in the world do we have these crazy projects?" And, "We don't want any more of them, and we want to get our country out of this mess."

But given that everybody—borrower, lender, taxpayer, legislators who let all of this get out of control—we all kind of were not paying attention during the 1970's when everything got started.

And it seems to me that we all share the responsibility for trying to repair the damage as best as can be done at this late stage. Because otherwise, we really are watching countries slide into what looks to be fairly permanent recession.

I think we need the equivalent of something like a bankruptcy court for countries. It does not exist, but there is no reason why it cannot. There is not any inherent reason why it cannot be created.

Any business—and many of the big businesses here exceed the size of a number of the countries we are talking about, in economic terms—any business that was in the kind of mess that so many developing countries are in right now, would be reorganized under a chapter 11 situation, or dealt with in a straight bankruptcy situation, in order to get it started again.

I mean, there is no way that a totally failed business can regain the opportunity to employ people, produce goods and income from this position in which many developing countries find themselves today.

I think we ought to try to—maybe act like adults, and recognize that the situation is out of control, and do something about it from the point of view of, where do we want to be 10 years from now, not are the interest payments next month going to be made.

That is where ideas like "debt-for-nature" swaps came in. I helped develop that idea, but it is not the be-all and end-all. The reason for it, for talking about that, was to make the link between the possibility of debt reduction, and the possibility of environmental recovery, come together.

There is no reason why they absolutely have to. It is convenient because that is the situation we are in now: the countries are facing debt, and are facing deteriorating natural resources. But obviously, the problems of natural resources management will continue long beyond the solution to the debt, and the debt itself must be reduced in a much larger way than one could conveniently hook to just natural resources management.

But it was an image which showed the possibility of agreements, of a quid pro quo, of a set of promises of new programs or policies in return for a set of promises having to do with debt reduction.

It illustrates that point. It happens to be good for projects and programs. The debt-for-nature swaps that have been done until now are fairly moderate in size, but add up to tens of millions of dollars. They have actually produced local currency funds for locally generated projects done by local conservation groups and local governments.

They are, of course, so far, very narrow in scope. They have mostly been aimed at park management, at land recovery and management in the parks and protected areas, that type of scheme. That is too narrow for natural resources recovery that really is the focus of the hearing today. A much broader range of problems needs to be addressed, such as agricultural practices and soil erosion, fisheries management, all of the forest management areas that are not going to be in protected areas. But it does make this link.

I would like to find a way—we have been working on various methodologies, but it requires a very broad public debate in this country and in other creditor countries, and in all of the borrower countries that want to participate—to adapt this notion to a bigger engine for debt reduction, and a much bigger engine to fund sustainable development.

Thank you.

[The paper referred to in Ms. Bramble's statement follows:]

THIRD WORLD DEBT AND NATURAL RESOURCES CONSERVATION: TRAGEDY AND OPPORTUNITY

The Global Bargain

The linkage between the debt crisis and natural resources conservation requires some explanation, since it is not immediately obvious. The connection is important, however, not just in terms of understanding the present pace of environmental deterioration in developing countries, but also in the search for solutions. Since a significant part of the debt is unlikely to be repaid anyway, without unacceptable social costs, it should be possible as part of the solution to the debt crisis, to negotiate a bargain: why not trade partial debt relief by the creditors in return for new environmental/social policies and local currency investments in conservation/development programs by the borrowers? In this way, something of value for the future of mankind can be salvaged from the tragedy of the present financial impasse.

The Debt Crisis

Recently, the international debt crisis is being recognized as a long-term problem that will require years to work

out. It was precipitated by the skyrocketing oil prices and interest rates of the late 1970s combined with a recession in most industrialized countries in the early 1980s. This led to a glut on the world market and low prices for most of the goods (usually raw materials) produced by developing countries. But these precipitating events only made the problem visible in the newspapers. The debt was quietly building up for years before it became a "crisis" in 1982. The combination of high interest payments on the debt and low prices for the goods they sell means that most developing countries are short of the foreign exchange needed to finance imports, even the spare parts to keep machinery going. This situation is compounded by the fact that many countries borrowed large sums of money for ill-advised and unproductive "development" projects, as documented in such publications as "Bankrolling Disasters" and "Financing Ecological Destruction."

Now, many countries cannot afford to pay interest on the debt and simultaneously finance programs for real development. So they have fallen into a continuing state of recession, with declining income, nutrition, health and education, especially among the poor majority.

The external debt of the Third World is approximately $1.3 trillion. A significant portion of this sum is

owed by Mexico, Brazil, Argentina and a few other countries of Latin America. Although most banks have improved their position over the last few years by building up reserves, default by any of the major debtors would still threaten a handful of North American money center banks. The external debt of another group of 40 to 50 countries, mostly in Africa, is not large enough to precipitate an international financial crisis, but is enormous in relation to their own economies. Approximately two-thirds of Latin American debt is owed to commercial banks, and one-third to official creditors. In Africa, the reverse situation is true, with most of the debt owed to official sources such as government agencies and the World Bank.

When the debt crisis began to hit one country after another, in the early 1980s, the International Monetary Fund took on a new role. Originally, it had the responsibility to help individual countries through temporary imbalances in their international trade. Now the IMF, with its short-term perspective, suddenly found itself advising dozens of countries and arranging crisis loans, in a situation that turned out to be long-term in nature. The IMF was giving all the ailing nations the same advice: cut government spending, cut imports, increase exports, devalue the local currency. These so-called "austerity measures" were the conditions for receiving IMF "stabilization" loans. The World Bank undertook an increasingly similar

role, in negotiating structural adjustment loans - i.e., loans to help countries through the painful period of implementing the austerity conditions and thereby "adjusting" their economies. Working out an agreement with the IMF/World Bank for such structural adjustment has been the required "seal of approval" which qualified a country for new loans from other sources, such as commercial banks and foreign governments.

While the economies of many developing countries were undoubtedly mismanaged, with subsidies for wasteful overproduction and state-owned enterprises, the IMF-prescribed austerity measures could only work if they were addressing the basic problems. But it is manifestly impossible for scores of developing countries to prosper if they are all competing with each other to sell more and more of the same limited range of products and raw materials. As the debt crisis lengthened into years of recession, the bitter IMF medicine, aimed at a "quick fix", has sent developing country economies into reverse. Unemployment and underemployment have skyrocketed. Basic long-term investments in education, health and natural resources management have been retarded as part of the required cuts in government spending. UNICEF has documented significant rises in the rates of malnutrition and infant mortality, along with reductions in literacy, and life expectancy in many of the debt-ridden developing countries. The

effects of the IMF's unproductive austerity regimen will be felt for many years.

In the mid-1980s the prescriptions, such as former U.S. Treasury Secretary's "Baker Plan", somewhat changed: instead of economic contraction, the new advice was to grow out of the debt crisis, again with an emphasis on exports. But by now the commercial banks had realized the long-term nature of the debt crisis, and most lost interest in throwing good money after bad in new loans. So new lending for economic growth slowed, and many developing countries wallow in a continuing recession.

The next step in the agonizingly slow process of recognizing the inevitable was recently taken by the current Secretary of the Treasury, in the so-called "Brady Plan." It is now admitted that for many countries, the only possibility for returning to economic progress is to negotiate some form of debt relief. But the Brady Plan is rejected by the borrowing countries as too little, too late; and it has no mechanism to bring the lenders to the negotiating table. It seems clear by now to policy makers in the United States and Europe, and even some bankers in their private moments, that debt reduction is inevitable. And to make any difference in the spiral of economic and political destruction that threatens many fledgling democracies around the world the debt reduction must

be drastic: perhaps an average of 50%. If, in appropriate cases, this debt relief is linked to commitments by the borrowers to conserve and manage their basic natural resources, and address the basic health, education and nutrition needs of their citizens, the combination could put them on the road to the kind of sustainable development described in "Our Common Future", the report of the U.N.'s World Commission on Environment and Development.

Natural Resources Conservation and Development

Sustainable development depends upon a healthy natural resource base. Yet, the debt crisis and the need to increase short-term economic productivity is forcing developing nations to accelerate the exploitation of their natural resources, and to cut or delay the implementati of conservation measures that could reduce long-term resource degradation: timber extraction without replanting, conversion of mixed farmlands to massive unsustainable cash crop monocultures, and destruction of valuable wetlands are all increasing. This degradation will reduce the potential for sustainable development in agriculture, forestry and fisheries.

In the state of Sao Paulo, Brazil, thousands of people have been thrown out of their jobs by the recession accompany the debt crisis. As a consequence, whole communities

have invaded and cut forests along steep coastal hills in search of fuelwood and homesites. Destruction of the forest is leading not only to extinction of potentially valuable plant and animal species, but also to massive soil erosion, which is cutting off highways and falling on homes and factories below. Haiti, once rich in mahogany forests, is in danger of being reduced to a barren rock by desperately poor people who cut down trees for fuel.

Mexico is rapidly squandering the groundwater supply in the northern states to irrigate vast fields of vegetables grown for the U.S. market. As the water table drops, irrigation pumping costs are increasing. Within a few years, the farms may no longer be economically viable. Unfortunately, by then lack of water will reduce the alternative development options for the region.

The IMF and the World Bank play a critical role in the development/environment/debt connection. In some cases, the World Bank has funded projects which resulted in serious damage to forests, farmlands and watersheds, natural systems essential for sustainable development.

Similarly, austerity measures, demanded by the IMF for short-term goals of structural adjustment, have discouraged sound investments in natural resource management for long-term development. Moreover, IMF policies may stimulate

the development of fragile lands for agriculture exports, or induce the rapid depletion of forests. For example, a sudden cut in fossil-fuel subsidy programs, where firewood is scarce, can lead to severe degradation of existing marginal woodlands, erosion and loss of soil productivity. Instead, continuation of the subsidy is needed while fuelwood plantations are established.

Towards a Solution

Protection of the natural resource base and welfare of the poor should be a vital part of all negotiations on the debt crisis. As part of each economic recovery program, borrowers will need assistance to design a strategy for sustainable development, since the temptation to continue patterns of investment for short-term profit, at the expense of the future will be hard to resist.

At the same time, structural adjustment policies and the conditions for all new loans from the World Bank and the IMF must be re-designed so that they encourage sustainable development. This is particularly crucial because their loan conditions and policies are being used as benchmarks for lending by other institutions.

The World Bank is slowly shifting emphasis in this direction, setting policy guidelines to avoid or minimize damage

to tropical forests and watersheds. Similar measures should be implemented by the IMF. Unfortunately, the IMF lacks a policy framework, appropriately trained staff or even an evaluation system to enable it to make the required changes. The normal formula for structural adjustment loans is outdated and unproductive; a new sustainable development conditionality should be adopted:

First, along with basic nutrition, health and education, several kinds of natural resources programs should be exempted from austerity budget cutting, especially forestry and watershed management, coastal fisheries management, and soil conservation programs.

Second, if a country has undertaken land tenure reform or redistribution programs with the aim of creating a more equitable and environmentally sustainable livelihood for the poor, funding support should be given. Such programs can relieve pressure on marginal lands and give new landowners a stake in practicing sustainable agriculture.

Finally, export incentives should only be given for projects that avoid long-term costs, particularly the destruction of tropical forests and marginal lands.

Equally important to the conditions for new loans is the need to address the heavy debt with which many developing

countries are already burdened. Growing numbers of creditor banks and official agencies are realizing that many debtors simply will not be able to continue paying even the interest unless the burden is eased. The private sector is already arranging small-scale "debt-for-nature" swaps, offering modest debt relief in exchange for nature conservation; Bolivia, Costa Rica, Ecuador and the Philippines recently announced programs in which foreign (commercial bank) debt is canceled in return for the borrowing country placing an equivalent sum of local currency into a fund, managed by local conservation groups, to support national parks, reforestation, sustainable agriculture projects, etc. But these stereotyped "debt-for-nature" swaps should not be seen as the only, or even the principal, linkage between natural resources conservation and the debt. Their tiny size up to now means that they have no effect on the quantity of overall indebtedness. And because the idea was born in the United States, even though most of the actual swap proposals have come from the borrowing countries and the projects are managed by local groups, the concept has been misinterpreted by some as another northern raid on southern resources -- "eco-imperialism." Moreover, those significant segments of public opinion in borrowing countries who question the legitimacy of the debt because it was contracted without the consent of the civil society, or disappeared in fraud, corruption and capital flight, or was wasted on pharoanic mega-projects,

or has been paid over and over in the form of high interest rates, reject the idea of paying the debt yet again in the form of "locking up" tropical rain forest or other resources.

Instead, "debt-for-nature" swaps should be seen as the germ of an idea, and it is slowly being realized that banks will have to shoulder the responsibility they incurred for their past lending decisions, i.e., "take a bit." No matter what their position on the legitimacy of the origins of the debt, most people in borrowing countries would be interested in a settlement that could stop the hemorrhaging of financial resources from south to north, and holds some promise of a new vision of sustainable economic development.

In the end, as part of the solution to the debt crisis, a global bargain must be negotiated, in which significant debt relief is traded for major changes in environmental policies and programs to assist the poor in the debtor countries. Affected communities and citizens organizations must be fully involved in the design and implementation of the changes. In addition, the wasteful consumption of energy and raw materials, and the need for appropriate economic adjustment (such as the removal of trade barriers) by the industrialized countries would have to be addressed in such debt negotiations.

Borrowing nations have the right, and perhaps the responsibility, to initiate these discussions, as their response to the Brady Plan. After public debate of their own programs for sustainable development, such proposals by the borrowers would make a strong case for debt reduction. Then all that is needed is a table for such negotiations, and the political will in the creditor nations to meet them there.

Representative SCHEUER. Well, thank you very much, Ms. Bramble. I will have some questions for you about the Brazilian experience. And then if there is any way that you can give us some of the details, the nuts and bolts, on the various happenings, the various debt-for-nature happenings, I would like to include that.

Ms. BRAMBLE. We have a lot of that written up, and I have some of it with me, and I can certainly submit a detailed description of the debt-for-nature swaps up till now for the record.

Representative SCHEUER. All right, we will appreciate that very much. And I will ask unanimous consent that the record be kept open for this information.

There being no objection, it is so ordered.

[The following information was subsequently supplied for the record:]

DEBT FOR NATURE: AN OVERVIEW

By Konrad von Moltke
World Wildlife Fund

In a 1984 op-ed piece published by the *New York Times*, Thomas Lovejoy, then vice-president of World Wildlife Fund-US, suggested a program to use debt of less-developed countries (LDCs) for conservation purposes. The proposal was met with some incredulity. The obstacles appeared insuperable at the time:

- Debtor countries needed to be convinced that such a program was not a way for creditor countries to obtain control over Third World resources – the "imperialism" issue;
- Banks needed to be convinced that such a program was in their interests;
- Governments of creditor countries needed to be convinced that debt/nature swaps were compatible with regulations governing the activities of nonprofit organizations;
- Conservation organizations needed to be convinced that debt/nature swaps were a better use of their staff and financial resources than alternate programs and that they could deal successfully with all the parties involved;
- Because conservation and banking have not traditionally been seen as interrelated, the links between the conservation community and the banks were tenuous at best. What links there were had grown out of the individual philanthropic commitment of certain people in the banking community;
- Conservation organizations' contacts in Third World countries did not generally include the kinds of people who would need to approve debt-related operations; and,
- In some creditor countries, the tax situation with regard to donations of LDC debt to conservation organizations was murky at best.

All these issues continue to need attention, but over the past months, a number of breakthroughs have made debt/nature swaps a realistic proposition. The basic idea is deceptively simple. Most major banks in the developed world currently hold large amounts of hard currency debt from some 20 Third World countries, and it appears increasingly unlikely that this debt will be repaid in full. If conservation organizations acquire title to this debt, they may be able to negotiate with the debtor countries to obtain repayment in local currency at a favorable conversion rate and use the proceeds for conservation in the country concerned. Depending on the costs of such transactions, conservation organizations may be able to realize a significant increase in the resources ultimately available for conservation in the debtor countries. However, this simple idea hides many pitfalls.

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THE FIVE STEPS OF A DEBT/NATURE SWAP

In every phase of debt/nature programs, several issues exist that can be viewed as impediments to success or as factors that can be varied creatively to enhance conservation. One of the particularly interesting aspects of debt-for-nature transactions is that they establish an operative link between conservation and the financial markets, something that has long been suspected to be possible but that has not yet been made tangible.

The first step in any debt/nature swap is to obtain approval in principle from the debtor country. This can involve negotiations with three key parties: the government, the central bank, and an appropriate private conservation organization that will receive the funds and manage the agreed program. The private conservation organization in the debtor country is arguably the most important of these three parties. Conservation organizations in developed countries are caught in a double bind because they must relinquish effective control over the funds to avoid the "imperialism" issue but must also be able to vouchsafe to domestic donors and tax authorities the continuing responsible use of these funds. Only strong private conservation organizations in the debtor country can meet this double criterion. Thus, organizations that have spent many years building relations of cooperation and trust between conservation organizations in developed and LDC countries are finding just how important these relations can be.

Negotiations with the debtor country's government can cover a wide range of issues, such as the exchange rate to be applied in converting debt into local currency, the conditions of payment (or the conditions of a local currency bond that may be issued in exchange), and aspects of the program for utilization of the proceeds.

The second step involves obtaining the debt instrument. The secondary market for Third World debt will establish a base price for the debt of the country concerned. Market prices for Third World debt vary considerably, ranging from a few cents on the dollar all the way to parity. Clearly, the lower the price, the greater the leveraging potential. However, market price is also a clear indication of the risks involved.

The secondary market for LDC debt is highly imperfect. LDC debt cannot be freely sold by banks because of

covenants that have been entered into in the course of rescheduling negotiations and that essentially ensure that none of the major creditors dispose of the debt without approval from the others. Transactions can occur only if there is reasonable prospect of obtaining approval from the debtor country (otherwise the debt cannot be converted) so that the debtor country also exerts effective control over the transactions which take place. Finally, many more potential sellers than buyers exist, limiting sellers' ability to dispose of these assets. The prices quoted on the secondary market are not openly established: rather, they represent a best current estimate. As a result, prices are subject to fluctuation and can prove to be negotiable, providing significant opportunities for conservation benefits.

The money needed for debt acquisition can be raised in many ways. For organizations this is a classic fund-raising issue so that the key considerations are whether such a program taps new sources of funds or is potentially conflicting with other fund-raising strategies. In the latter case, the opportunity cost of opting for debt/nature swaps must be taken into consideration. Ideally debt is donated outright by the creditor banks since this clearly represents a new and otherwise inaccessible source of funds. Unfortunately, numerous considerations–outlined below–make banks hesitant about outright donations. There are, however, a wide range of options short of donation, including sale at a preferential price or donation of cash for the purpose of purchase on the market. Of course, any transactions undertaken must be consonant with the tax status of all parties involved.

The third step is the transfer of title to the debt. This is a technically quite complex transaction. It is generally possible to obtain debt for many countries when necessary. Even so, each transaction requires careful individual attention. Of course, one important decision is who the actual purchaser shall be. In some instances, it may be appropriate for the conservation organization in the creditor country to acquire the debt and then donate it to its partner in the debtor country; in others, it may be possible to donate the necessary resources to permit direct acquisition of the debt by the debtor country organization. In a third version, debt may be donated directly to the LDC conservation organization, acting as an agent for the developed country organization. The factors governing the choice of actors in this situation are mainly financial and tax-related, although under certain circumstances accounting considerations may enter for the developed-country conservation organization.

The fourth step is conversion of the debt in accordance with the agreement reached with the debtor country's government. This can involve the issuance of local currency bonds, measures to protect certain sensitive areas–purchase, legislation or some other means–the cash payment of local currency in redemption of the debt, or any combination of these.

The final step is the execution of the agreed on conservation program. The importance of this step should not be underestimated. It is the ultimate goal of the entire program. At the same time, the reputation of the creditor country conservation organization can be at stake because it must be in a position to assure donors and tax authorities as to the appropriate use of funds it has received.

INTERESTS AT STAKE

A debt/nature swap involves numerous actors. To be successful, it requires that each of these actors have a substantive stake in its outcome. As with most other economic transactions–and, at heart, debt/nature swaps are economic transactions for conservation purposes–the best deal is one in which every actor receives some significant benefit and the balance of advantages is perceived as equitable by all. Hence, an assessment of each group's peculiar interests–and of potential problems that may jeopardize these–is essential.

One of the major advantages in debt/nature swaps is the difference in the interests of various actors that allow a range of solutions to problems which may arise. Indeed, there are relatively few issues on which significant conflicts between actors are to be anticipated.

CREDITOR COUNTRY CONSERVATION GROUPS. The aim of creditor country conservation organizations is to achieve maximum conservation benefit with limited funds. Debt/nature swaps make sense only if they generate new funds that would be otherwise unavailable or if they increase the effectiveness of existing funds.

When debt/nature swaps attract new funds, there can be no doubt that they are in the creditor conservation organization's best interests, provided they can be effectively utilized. However, debt donations for LDC countries where no effective conservation organizations exist need to be viewed with extreme caution. New funds are clearly involved when debt is donated or when donations are received from new sources–or in significantly increased amounts from existing sources–for the specific purpose of debt/nature swaps.

The situation is much more complex when debt/nature swaps require a commitment of existing funds. Swaps which skew general program priorities must be avoided, and a careful assessment must be made of a debt/nature program as compared to other uses of funds. Such an assessment must take into account factors such as the opportunity cost of alternate investments, exchange rate fluctuations and the impact of inflation in the debtor and the creditor country. In economic terms, these issues define "additionality" for the conservation organizations–

that is, the extent to which debt/nature programs generate new benefits in the attainment of these organizations' goals.

It is important to convey to banks and debtor countries' governments the basic fact that conservation groups do not seek to conserve capital as a goal per se, but seek to give away money for conservation. Capital management must occur in the context of making full use of available resources. Many countries do not allow significant levels of capital formation in conservation and other nonprofit organizations, placing them in an advantageous position in relation to debt/nature swaps, since the threat of losing capital is not an insuperable deterrent. Consequently, conversion into local currency bonds can be acceptable even when high inflation rates may threaten the ability of the recipient organizations to conserve available capital. Of course, such a conversion is attractive only if the interest payments alone provide benefits exceeding the opportunity cost of alternate uses of funds.

The other major advantage enjoyed by conservation organizations is that they have a wide range of activities in debtor countries that require nothing but local currency. Contrary to many debt/equity swaps that may need hard currency inputs to the investment, debt/nature programs can be designed to consume virtually no hard currency resources at any time.

BANKS. The interest of creditor banks in debt/nature swaps is difficult to define. Most major banks are actively disposing of Third World debt in the secondary market. Insofar as debt/nature swaps involve the regular purchase of debt in the secondary market, banks welcome conservation organizations to that market as they would any other potential purchaser. This interest does not, however, suffice to justify giving conservation organizations special consideration, unless it becomes clear that they cannot purchase debt without some additional inducement. This is the case when the benefits of a debt/nature swap are not sufficiently superior to other uses of available funds to justify the risks involved. As a rule of thumb, this situation arises when the total benefit generated by a debt/nature program is less than double the benefit that can be derived from more traditional financial strategies. In this case, it may be in the commercial interest of banks to improve the conditions of purchase so as to keep a potentially significant customer in the market.

Beyond this essentially commercial relationship, there may, however, be other reasons that could induce banks to participate more actively in debt/nature transactions. Of course, banks may be willing to donate funds for classic philanthropic reasons, but in that case they would presumably also be willing to donate funds to other kinds of conservation programs so that the recipients would need to assess the comparative advantages of such a donation. Some banks, generally those holding only limited amounts of LDC debt are seeking to dispose of these assets because they find that the uncertainties of valuation and the complexities of future participation in renegotiation and rescheduling outweigh the residual economic benefits of holding the debts. Since LDC debts represent a small portion of their debt portfolio, these banks can dispose of them without risk to their overall financial strength. In these cases, a donation may prove the most direct and efficient method of disposal, avoiding the uncertainties of the secondary market and generating some publicity and goodwill.

The most intriguing motives may, however, relate to the long-term development of financial relations between banks and the debtor countries. Many banks are currently primarily interested in divesting their Third World exposure. For every ten banks seeking to divest, however, there may be one which anticipates further business from a given country and is consequently interested in keeping that country's debt from becoming worthless and in developing goodwill in the country.

The deterioration of Third World debt represents a real threat to long term commercial relations with debtor countries. This is the "czarist bond" issue. When a country's debts have been written down by the creditor banks, they are still not retired. Their book value to the banks has been reduced or eliminated, but they represent a full liability of the debtor country. Unless this liability is liquidated, it can cast blight on financial relations between the banks and the country concerned. Experience with the czarist bonds suggests that this blight can last for a long time indeed–particularly when exacerbated by deteriorating political conditions in the country concerned.

Quite apart from the czarist bond issue, banks intending to continue to do business with a country have an interest in generating goodwill in the country in question. For every country there are bound to be some banks in this situation. Goodwill is an intangible, and as such may not have a definable price in terms of a given bank's willingness to spend resources for such a purpose. Nevertheless, two of the attractions of debt/nature programs are their long-term nature–successful conservation aims at perpetuity–and the fact that they address communities in these countries that have growing influence but are not normally sympathetic to a banking perspective. At the same time, a carefully designed conservation program can frequently improve broad measures of economic performance by promoting a more sustainable economy.

More complex still is the question whether debt/nature swaps contribute measurably to the stabilization of LDC debt. In most countries, the total volume of debt/nature swap transactions is small relative to the principal amount of debt. Relative to annual interest payments, however, they appear more important. Many countries are

in fact making partial interest payments while the balance is in practice added to principal. Virtually no new real loans are being made. Debt/nature swaps need to be measured not against the outstanding principal, nor against annual interest payments, but against the effective annual rise in principal attributable to a country's inability to service its debt. A country's debt situation can be considered stabilized when interest payments are not causing an increase in indebtedness. Measured against this standard, debt/nature swaps can indeed make a noticeable contribution towards a more viable LDC debt situation.

Although conservation organizations have some differences from country to country, their interest in conservation is quite general. For banks, however, interests may differ quite significantly from one country to another so that it is necessary to determine each bank's specific interest in relation to each country.

CREDITOR COUNTRIES' GOVERNMENTS. Of all the actors in debt/nature swaps, the interest of creditor countries in such programs is least well defined. It is broadly philanthropic. Insofar as debt/nature programs are conducted within established guidelines for philanthropic contributions, they do not require the active approval of creditor countries' governments. In some instances, such programs may, however, explore new ground – for example, in relation to the tax valuation of donated debt. In this case, government approval can be expected only if the program can be assimilated into existing tax and accounting regulations.

Beyond the general issues of philanthropy, creditor countries' governments have an interest in any program that contributes to stabilizing of LDC debt without requiring specific government intervention. Some form of public involvement in liquidating the Third World debt problem is clearly needed, at the very least by way of tax write-offs for debt losses. Insofar as debt/nature programs achieve this end without requiring positive government action they are likely to be welcomed by these governments.

In the specific area of tropical deforestation, it has long been recognized that large-scale deforestation can contribute to regional and global environmental change and thus affect vital interests of the creditor countries. Thus far, few effective mechanisms have been discovered that allow creditor countries to contribute to more sustainable management of forest resources in LDC countries; debt/nature swaps may prove such a mechanism.

Finally, debt/nature programs can be assimilated into development aid programs, with the difference that they involve no expenditure of public funds. Much the same rationale applies to them as to other forms of private development assistance.

DEBTOR COUNTRIES. The crucial issue for debtor countries is the extent to which debt/nature swaps result in a greater net benefit than would otherwise be available. From these countries' point of view, these swaps must be compared to the activities creditor country conservation organizations are likely to undertake in the absence of a debt/nature program. There appear to be essentially two avenues to maximize the net benefit: by substituting external (hard currency) funding for expenditures they would need to make anyhow or by ensuring that a greater proportion of hard currency debt is retired by a debt/nature swap than would be the case by other means.

In the first instance, the interests of debtor countries and conservation organizations are less easily reconciled: conservation organizations can only to a limited extent justify raising funds in their country to defray expenses LDC countries would have to make anyhow. In the second instance, the interests of the debtor country and the creditor country conservation organization are congruent; they can, however, only be realized with active support from the banks.

Debtor countries must also confront the question whether debt/nature programs represent interference with their domestic priority-setting procedures. In most instances, however, debt/nature programs cover activities already approved directly or indirectly by debtor country governments but for which no funds, or inadequate funds, are available. Under these circumstances, debt/nature programs can be seen as a means of achieving debtor country goals in an area where funds have been chronically short because of the apparently more pressing needs of short-term economic development. In other words they support long-term needs that are recognized but have proven hard to meet.

If debt/nature swaps are undertaken in large amounts, a further issue for debtor countries would be to ensure that the conversion of debt into local currency does not create distortions of the money supply – i.e., contribute to inflation. This can be done in a number of ways – for example, through the issuance of local currency bonds with a term equivalent to that of the retired debt instrument rather than cash for the debt. In this instance, debt/nature swaps may have a deflationary effect, since the exchange of external for internal indebtedness reduces the inflationary pressures of a shadow hard currency economy.

Finally, the willingness of conservation organizations to transfer funds into LDC countries, even at the risk of losing a significant portion of the principal is an important symbolic act signaling a faith in the long-term resources of the country and its ability to build a sustainable economy despite its current debt problems. Part of the LDC debt problem is a vicious cycle of indebtedness that engenders loss of faith in the economy, which in turn provides an incentive to withdraw funds from that econ-

omy and to seek "investment havens," generally in hard currencies. In a real sense, conservation expenditures in LDC countries represent an expression of faith in the future of these countries.

MAJOR PROBLEMS IN THE CREDITOR COUNTRIES

Every debt/nature swap must be crafted individually. There are too many interests involved to permit generic solutions. The main constant from country to country is likely to be the creditor country conservation organization, provided it has the capacity to generate funds in the relevant creditor countries and to monitor the programs funded by the swap. All other actors are, however, liable to vary from one program to another: debtor country, recipient conservation organization, and the banks involved. Nevertheless, the major problems that must be addressed are liable to remain much the same.

For the creditor country conservation organization, the major problem other than additionality is the capacity to ensure proper use of funds. This issue is particularly tricky. Large amounts of money can create difficult relationships. A balance needs to be struck between the need to ensure the recipient's autonomy and the donor organization's obligations in terms of monitoring the program. At the same time, care must be taken not to create a situation where the recipient organization becomes dependent on a continuing flow of support from the debt/nature programs, since these cannot be assumed to continue indefinitely. These issues become magnified in LDCs as the size of the program grows. It is just as possible to destroy an organization by overfunding as by underfunding, only that the process of destruction is less apparent since it manifests itself in loss of initiative, loss of contact with local constituencies, and an insidious skewing of recipient priorities to meet the perceived needs of the donor. Even with advantageous leveraging, debt/nature swaps can involve large sums of money that need to be available in substantial blocks since it is not possible to undertake numerous small debt exchanges. This, in turn, can generate cash flow problems for the creditor country organization.

For banks, the two major problems are the absolute need to avoid even the appearance of debt forgiveness and the obligation towards stockholders to justify the use of bank resources. Banks have traditionally sought to avoid direct involvement in issues of general policy. The development of a debt/nature program will generate goodwill in the debtor country. But an important justification is based on the principle that it contributes to the long-term stability of the country. Banks may not wish to become too actively involved in a program that can be perceived as taking a stance on policy issues.

THE WAY AHEAD

Debt/nature programs represent a remarkable opportunity not only for conservation, but also for strengthening ties between developed and LDC countries at a time when these are sorely in need of strengthening. The large number of actors involved, as well as the complexity of some of the issues, imply that it will be some time before debt/nature swaps appear routine. As with many other issues, it will require the development of an international community of persons in conservation organizations, banks, and government, knowledgeable about the issues involved and sufficiently confident of mutual relationships to be able to transact many details at a distance.

Debt/nature programs respond to a specific situation that may not continue very long. If a negotiated long-term solution is not found by banks and LDCs, most debt will be written down to a level that renders it worthless for most practical purposes. On the other hand, working on debt/nature programs opens new avenues of achieving the goals of conservation, and, while debt/nature programs may not be around for long, the lessons learned from working together with the banking community may open up other unexpected avenues for financing conservation work in Third World countries. Conceivably, ways can be found to put debt that has been written down to virtually nothing to good use or to develop creative financing programs for countries whose debt is traded at or near parity.

Perhaps the long-term lesson from debt/nature will be that conservation organizations and banks need to work together more closely to ensure that the financial creativity of the banking community and the expertise of the conservation community can combine to contribute to more sustainable economies in the Third World.

OPPORTUNITIES FOR INTERNATIONAL COOPERATION

Some 20 countries are heavily indebted to commercial banks. Many more carry large bank debt burdens and are managing but could benefit from reductions in this burden. At the same time, LDC debt is quite widely held, so that most industrialized countries are affected, even though the financial situation of banks differs from one country to the next. This suggests a pattern of cooperation that is particularly interesting.

On the one hand, cooperation is necessary between conservation organizations in creditor countries so that they can approach the relevant banks and acquire debt titles. This can occur in virtually all the major industrialized countries. Over the past few years, a process of consolidation has occurred with banks exchanging debt between each other so that the approach to debt is more focused.

Despite this process, the number of banks involved is still very large and spread over many countries.

On the other hand, cooperation is necessary to ensure that relations with debtor countries' conservation organizations are not jeopardized by confusion among potential donors. It will probably be necessary to achieve a division of labor where conservation organizations take a lead role for a given country or project and act as conduit and lead agent for debt transfers to the country or program concerned.

PRINCIPLES OF ACTION

Two fundamental principles need to be kept in mind in developing debt/nature programs:

- Debt/nature programs are only possible where strong conservation institutions exist in the debtor country.

- Debt/nature programs must be fair and must be seen to be fair, that is, the interests of all parties involved must be taken into account. ■

Representative SCHEUER. All right, now we will hear from John Sewell, who has headed up the Overseas Development Council and who has played an outstanding leadership role in producing enlightened concepts, theories, and programs for development around the world.

Please take 10 minutes, Mr. Sewell, and chat with us.

STATEMENT OF JOHN W. SEWELL, PRESIDENT, OVERSEAS DEVELOPMENT COUNCIL

Mr. SEWELL. Congressman Scheuer, thank you for those kind words.

I, too, want to say that you are to be commended for holding this set of hearings. It is absolutely essential, so that we in Washington recognize both the problems and the need to enlighten both policymakers and the general public on the crucial issues of poverty and environmental sustainability.

I am not going to summarize my prepared statement but simply make four quick points. Much of what I have to say is drawn from three of the Overseas Development Council's recent publications: "Strengthening the Poor: What Have We Learned," which assesses the efforts over the last 20 years to promote poverty-oriented development; "The Politics of Economic Adjustment: Fragile Coalitions," which deals with the very tricky political questions of the kind of economic adjustment programs that Barbara Bramble was referring to; and perhaps most importantly, a brand new policy study titled "Environment and the Poor: Development Strategies for a Common Agenda," which we will be publishing very shortly. I will send you the overview essay to that volume, as soon as it is available, for use by the committee.

Representative SCHEUER. Very good. That would be very fine.

Mr. SEWELL. Let me make four main points which clarify the relationship of sustaining the environment and eliminating global poverty, and the relationship of the debt question and U.S. policy to those goals.

The first point I want to make has been made by a number of your witnesses so far: that is simply that the debt crisis has derailed three decades of progress in the developing world.

It is worth reminding ourselves that progress in development, since the effort began in the post-World War II period, was quite remarkable up until 1980. Economic growth rates exceeded anything we experienced in the industrial world during our industrial revolution, and there were great gains in social well-being, whether measured by decreases in infant mortality, lengthening of life expectancy, or education.

After 1980, all of that came to a halt due to the debt crisis. What you have seen, particularly in Latin America and Africa, is a lost decade, where development has gone backward, whether you measure that rate of going backward in per capita incomes, which have dropped precipitously, or in terms of social indicators, or social expenditures.

And Barbara Bramble is quite right; we do not know quite what has happened. We can only rely on certain assessments that

UNICEF has made in terms of human well-being in the Third World. It is quite amazing that we do not know more.

But it is remarkable, for instance, that social expenditures in Latin America have gone down in the first, only the first part of this decade, from 44 percent of government expenditures to 36 percent. And we all know that was taken out of health care to the poor, efforts to protect the environment, and a variety of other social programs.

We will be seeing the impact of these cuts—what one of my colleagues calls "social debt"—for years to come, whether it is in terms of stunted capabilities of young people, or foregone maintenance in national parks, or a whole range of other areas.

Representative SCHEUER. Jim Grant and UNICEF have documented the impact of Third World debt on mothers and infants. And I think in a press release that they put out I think 6 months or so ago, in a study that they put out, as I recall, Grant postulated that a half-a-million women died in childbirth each year, who would not have died absent the pressure of Third World debt in reducing the health care expenditures of all kinds. And half-a-million infants died from birth to 1 year old, who would not have died.

And there was a pronounced increase in their rate of population growth during this same period of declining figures for per capita incomes annually, an identifiable increase in their population growth, as a result in decreases in expenditure for education, job training, and health care, particularly maternal and child health care, and family planning, a reduction in family planning programs.

So that they not only had decreasing per capita GNP but, as if to add ossa onto pilean, an increase in their already explosive population growth rates to exacerbate the whole situation.

Mr. SEWELL. And we see no end to this situation.

We have just done some quick calculations, which I will be happy to make available to you, estimating when people in the Third World would regain the incomes they had prior to 1980. Of course, it depends upon what assumptions you make about economic growth rates from here on out.

But the poor will not regain the per capita incomes they could have had had there not been a recession until some time well into the next century. That is my first point.

My second point, and I think it is a crucial one for thinking about policies to rectify the situation in the future, is that the combination of slow growth plus population growth means that growing numbers of the Third World's very poor people are being pushed into areas which are environmentally very fragile.

They are being pushed out of productive areas and into marginal areas, tropical forests, dry lands, steep hillsides, or into urban peripheries. And that has a set of implications for policy that are important for anybody concerned with both poverty alleviation and with environmental sustainability.

Because they lack support, using that term "support" very broadly, coupled with the imperative to survive—you have to eat, you have to cook a meal tonight—forces the very poorest people to put growing pressures on the very environment on which they depend.

In our new publication, the author, Jeff Leonard, of the Conservation Foundation, does a very interesting assessment of the so-called 700 million "poorest people in the world." Of those, only 250 million live in areas that have any decent potential for agricultural production in the future. The other 60 percent, 450 million, are either in the hillsides, tropical forest, or in the urban periphery, and it is those people who are putting the greatest pressure on the environment.

As a result of that, that study concludes that—and if I can read this to you for a second:

> The stark reality is that well into the 21st century, the number of poor people with little technology or investment capital and needing first and foremost to satisfy their basic food needs will likely continue to increase in low potential agricultural regions. In the quest to meet subsistence, these poor people are creating environmental problems that further impoverish themselves and their lands, threatening downstream production in higher potential areas and contributing to global ecological problems such as the warming of the Earth's climate and species extinction.

So we have a very close and important linkage between poverty and environment.

The third point I want to make to you is the obvious one, these issues demand priority first of all by developing country governments and policymakers, and also by international donor agencies.

The ODC study points out that there are two major emphases that should be put on development programs. One is to produce as much as possible in the remaining authorized procedure areas where you can produce food, both for export and consumption. That is the unfinished business of the "green revolution," because there is still a considerable part of the world open to high-intensity production.

But it is perhaps most important to look for, identify, and implement, multiple ways to increase incomes of people living in these very fragile areas, the 60 percent of the world's poorest people, in ways that they will not have to draw down on the very environment on which they depend.

There is a set of specific recommendations in the volume for policies in that area which I will make available to you. One I wanted to stress, however, is the crucial role of women, an area in which you have been very interested for years, but which is of paramount importance in addressing the intertangled issues of poverty and the environment.

The fourth and last point I want to make, an obvious one, is that U.S. policies can help address these problems of poverty and environment in three areas, and let me just mention them very briefly. The first is to set an example. When it comes to the global issues——

Representative SCHEUER. The first is what?

Mr. SEWELL. To set an example ourselves.

When it comes to the issues of global warming, it is still the United States and the rich countries that are the major part of the problem at the moment. Until we are prepared to take the tough steps that are necessary to deal with that problem, in terms of our own production, we are not very credible in the eyes of the rest of the world.

The second is obviously the debt issue, which has to have priority in our relations both with the Third World in general, for our own export interests, and because of the questions of environmental sustainability.

My own view is that Secretary Brady's initiatives and suggestions are commendable. We have yet to see how they will work out. And we are going to see the first test case in Mexico. I would be happy to go into this in questions, if you want.

There is, however, an opportunity for the U.S. Government, at very low cost, in the whole question of losing Africa's debt burden. Most of the industrial nations have forgiven or written off Africa's debt owed to official sources. We have been delinquent in that area over the last several years.

The second point I want to make is the same one that Barbara Bramble made on the debt issue. Debt-for-nature or debt-for-development swaps are very useful. They should be encouraged. But they are only a part of the answer to the solution, and should not detract attention from the need to deal with the overall debt situation.

Even here, it is worth underlining that where debt relief for the highly indebted countries is absolutely essential and necessary, it is not sufficient; that if you are concerned about poverty alleviation and environmental sustainability, we need a concrete and forward-looking set of policies to deal specifically with those issues.

I will give you just one example. If many highly indebted countries were relieved of their debt and began growing again at a rapid rate, under current patterns of energy usage and industrialization the effect on the global environment over the next several decades would be disastrous. So we need a positive policy to provide countries with industrial technologies which are not going to be as environmentally polluting as ours have been and that theirs would be in the absence of action.

The final point I want to make in relation to U.S. policies is that we need to take a hard look at U.S. aid programs. I do not have to tell you that aid budgets are not going to increase—not, at least until we come to grips with our own Federal budget deficit problem.

The question, therefore, is, how do we use available resources in a much better way to address these issues of poverty and environmental sustainability.

We tend to forget that the Reagan administration managed to significantly increase the foreign aid budget within the confines of the Federal budget. It went from $13.8 billion, if I remember it correctly, in fiscal 1980, to over $20 billion in fiscal 1985. It is now coming down, under the pressures of our budget deficit. But those increases under President Reagan went into military and security programs. Very little if any into development programs.

Even in the request which the Bush administration made for fiscal year 1990, some 63 percent of the proposed funds will go to international security programs, with the remainder going to development. Even within that development account, if one takes the rough categories of AID spending in the bilateral aid program, only some $600 million is going to programs that one can identify in a very gross sense to deal with sustainable development.

Now, of course, if budgets are going to be fixed, tough choice should be made to reallocate within those budgets. But I raise for you the issue of whether one should not look at reallocations from our international security accounts into development accounts. The benefits could be great.

You could gain a billion dollars a year for sustainable development programs by a mere 11 percent reduction in what is being requested for military and security programs for fiscal year 1990. And a billion dollars going into environmental and poverty programs would have a great impact, as well as setting an example for the future.

That leads to my last point. U.S. aid programs in the future are going to have to be a great deal more strategic and smarter than they have in the past. We are no longer the largest and sole donor of aid. We have been joined by a large number of other nations and organizations, and some time in the near future will be surpassed by the Japanese as the world's largest provider of aid overall.

Representative SCHEUER. I think that has happened already.

Mr. SEWELL. Well, there is some question about it, revolving around the exact date. But if we want to help set global priorities, we are going to have to be a lot more strategic in setting agenda and setting examples for other people.

Thank you very much.

[The prepared statement of Mr. Sewell follows:]

PREPARED STATEMENT OF JOHN W. SEWELL

SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH IN THE THIRD WORLD

I. INTRODUCTION

MR. CHAIRMAN, I AM VERY PLEASED TO HAVE BEEN INVITED TO TESTIFY ON THE EFFECTS OF THE THIRD WORLD DEBT ON SUSTAINABLE DEVELOPMENT. I PARTICULARLY WANT TO COMMEND YOU FOR SPONSORING THESE GROUND-BREAKING HEARINGS ON ISSUES THAT ARE CENTRAL TO THE UNITED STATES AND INDEED TO ALL NATIONS.

THE VIEWS EXPRESSED HERE, HOWEVER, ARE MY OWN AND DO NOT NECESSARILY REFLECT THOSE OF MY COLLEAGUES AT THE OVERSEAS DEVELOPMENT COUNCIL, OR OF ITS BOARD OF DIRECTORS.

MY STATEMENT DRAWS EXTENSIVELY FROM SEVERAL OF THE COUNCIL'S RECENT PUBLICATIONS, INCLUDING OUR FORTHCOMING U.S.-THIRD WORLD POLICY PERSPECTIVES VOLUMES, ENVIRONMENT AND THE POOR: DEVELOPMENT STRATEGIES FOR A COMMON AGENDA, EDITED BY H. JEFFREY LEONARD; THE POLITICS OF ECONOMIC ADJUSTMENT: FRAGILE COALITIONS, EDITED BY JOAN NELSON; AND OUR 1988 BOOK ON STRENGTHENING THE POOR: WHAT HAVE WE LEARNED, EDITED BY JOHN P. LEWIS. COPIES OF DR. LEONARD'S OVERVIEW WILL BE MADE AVAILABLE TO YOU NEXT WEEK, AND I HOPE IT CAN BE PUT INTO THE RECORD OF THESE HEARINGS.

II. DEBT AND DEVELOPMENT FAILURE: THE SHORT-TERM SURVIVAL NEEDS OF THE POOR

DEBT AND THE ENVIRONMENT HAV RISEN TO THE TOP OF THE INTERNATIONAL DEVELOPMENT AGENDA. THE TWO ISSU S ARE CL(ELY LINKED, BUT THE LINKAGES AND THE POLICY IMPLICATIONS THAT OW FROM IEM ARE NOT YET FULLY UNDERSTOOD BY DEVELOPMENT PLANNE . MANY OBSERVERS AND POLICYMAKERS, HOWEVER, ARE COMING TO REALIZE TH T SUSTAINABLE DEVELOPMENT CANNOT BE ACHIEVED WITHOUT A REVERSAL OF TH DISQUIETING TRENDS OF THE PAST DECADE, WHICH, IN TURN, WILL NECESSITATE RADICAL CHANGE IN CURRENT POLICIES.

IT IS WORTH REMEMBERING THAT, BETWEEN 1950 AND 1980, THE DEVELOPING COUNTRIES ENJOYED A HIGHER GROWTH RATE THAN THE ADVANCED INDUSTRIAL ECONOMIES DURING THEIR OWN INDUSTRIALIZATION IN THE NINETEENTH CENTURY. AS A RESULT, THE DEVELOPING COUNTRIES' SHARE IN REAL GROSS WORLD PRODUCT EXPANDED FROM 15% IN 1960 TO 22% IN 1985. THIS GROWTH WAS ACCOMPANIED BY REMARKABLE, ALBEIT NOT ALWAYS EQUITABLE, GAINS IN HUMAN WELL-BEING: BETTER HEALTH CARE, DECLINING INFANT MORTALITY, HIGHER LEVELS OF EDUCATION AND NUTRITION.

THIS DEVELOPMENT PROGRESS CAME TO A HA T IN 1982. IN TERMS OF ECONOMIC GROWTH, THE 1980S WAS A LOST DECADE IN MOST OF THE DEVELOPING WORLD. NET CAPITAL FLOWS HAVE TURNED AWAY FROM, RATHER THAN TOWARD THE DEVELOPING COUNTRIES. WORLD RECESSION AND OVERWHELMING DEBT SERVICE OBLIGATIONS CAUSED GROWTH AMONG LATIN AMERICAN COUNTRIES TO SLOW TO

ANNUAL AVERAGE RATES OF 1.9% BETWEEN 1980 AND 1987. PER CAPITA INCOME IS APPROXIMATELY 8 PERCENT LOWER TODAY THAN IN 1981, AND WAGES HAVE DROPPED BY 30-40% IN SOME COUNTRIES. THE SITUATION IN SUB-SAHARAN AFRICA IS EVEN WORSE. OVER THE PERIOD FROM 1980 TO 1987, AFRICA'S REAL GDP GREW BY LESS THAN 0.2% ANNUALLY; IN SOME COUNTRIES, INCOMES HAVE FALLEN BY AS MUCH AS 25% SINCE 1981. THESE TRENDS ARE EXACERBATED BY CONTINUING POPULATION GROWTH WHICH HAS MADE ECONOMIC AND SOCIAL PROGRESS EVEN MORE DIFFICULT.

THE PROSPECTS FOR GROWTH IN THE YEARS AHEAD ARE NOT BRIGHT. ACCORDING TO THE WORLD BANK, OVER THE NEXT SIX YEARS, LOW-INCOME COUNTRIES' GROWTH RATES, PARTICULARLY THOSE IN SUB-SAHARAN AFRICA, WILL BARELY MATCH POPULATION INCREASES; THE BANK PROJECTS THAT UNDER LESS THAN OPTIMISTIC CONDITIONS, PER CAPITA GDP GROWTH IN AFRICA WILL BE ZERO OVER THAT PERIOD.

THE INTERNATIONAL ECONOMIC CRISIS HAS FORCED A REDUCTION IN THE COMMITMENT BY GOVERNMENTS AND INTERNATIONAL AGENCIES TO ANTI-POVERTY PROGRAMS, AND ENVIRONMENTAL PRESSURES HAVE MADE IT INCREASINGLY DIFFICULT FOR THE POOR TO EKE OUT EVEN A SUBSISTENCE LIVING. AS DEBT SERVICING COSTS HAVE EATEN AWAY AT DEBTOR COUNTRIES' INCOMES, OVERALL GOVERNMENT REVENUE AND SPENDING HAVE DECLINED PROPORTIONALLY. THE RESULT HAS BEEN A DRASTIC DECLINE IN SOCIAL PROGRAMS.

AS THE PORTION OF DEBTOR CENTRAL GOVERNMENT EXPENDITURE DEVOTED TO INTEREST PAYMENTS GREW FROM 7 PERCENT IN 1980 TO 16 PERCENT IN 1985, SOCIAL SPENDING FELL FROM 32 PERCENT OF TOTAL EXPENDITURE TO 29 PERCENT,

ACCORDING TO THE IMF. DEBT SERVICE COSTS IN LATIN AMERICA, FOR EXAMPLE, AMOUNTED TO 27 PERCENT OF SPENDING IN 1985 AS OPPOSED TO 9 PERCENT IN 1980. AS A RESULT, SOCIAL SPENDING FELL FROM 44 TO 36 PERCENT. AS MY COLLEAGUE STUART K. TUCKER POINTS OUT, THESE REDUCTIONS CREATE A "SOCIAL DEBT;" FAILURE TO PROTECT HUMAN RESOURCES WILL REDUCE THE DEVELOPMENT POTENTIAL OF THIRD WORLD POPULATIONS IN COMING YEARS. THIS SITUATION POSES ONE OF THE GREATEST AND MOST IMMEDIATE CHALLENGES TO DEVELOPMENT POLICYMAKERS.

THE DEBT CRISIS HAS EMERGED AT A TIME WHEN MANY ARE ALSO COMING TO UNDERSTAND THE DEVASTATING EFFECTS THAT PROTRACTED POVERTY HAS HAD ON THE ENVIRONMENT. DEVELOPMENT ECONOMISTS HAVE TRADITIONALLY VIEWED THE RELATIONSHIP BETWEEN POVERTY AND ENVIRONMENTAL PROTECTION AS INHERENTLY AT ODDS. FORMER INDIAN PRIME MINISTER INDIRA GANDHI STATED THIS VIEW OF THE PROBLEM SUCCINCTLY: THE POOR MAKE A TRADEOFF WHICH LEADS TO A HIGH LEVEL OF ENVIRONMENTAL DEGRADATION IN ORDER TO MEET THEIR SHORT-TERM NEEDS FOR FOOD AND SHELTER. THEY ARE FORCED BY AGRICULTURAL MODERNIZATION AND INCREASING POPULATION PRESSURES ONTO MARGINAL AND ECOLOGICALLY FRAGILE LANDS WITH LITTLE ACCESS TO IRRIGATION OR SOURCES OF FUEL. IT IS THE EFFECTS OF THESE IMMEDIATE PRESSURES TO SURVIVE, NECESSITATED IN LARGE PART BY THE UNEQUITABLE CONSEQUENCES OF PREVIOUS DEVELOPMENT CHOICES, AND NOW EXACERBATED BY THE DEBT CRISIS, WHICH FRUSTRATE LONG-TERM ECOLOGICALLY SUSTAINABLE DEVELOPMENT.

SINCE THE EARLY 1980S, POVERTY ISSUES HAVE BEEN PUSHED ASIDE WHILE DEVELOPMENT POLICYMAKERS CONCENTRATED ON STRUCTURAL ADJUSTMENT PROBLEMS

AND SHIFTED THEIR FOCUS TO ECONOMIC LIBERALIZATION, MARKET MEASURES AND MACROECONOMIC POLICY REFORMS. IT IS ONLY RECENTLY, WITH RISING CONSCIOUSNESS OF GLOBAL ENVIRONMENTAL CONSTRAINTS AND RECOGNITION OF THE ADVERSE EFFECTS OF STANDARD STRUCTURAL ADJUSTMENT POLICIES ON POOR PEOPLE, THAT ANTI-POVERTY MEASURES HAVE RECEIVED RENEWED EMPHASIS.

III. CONDITIONS OF THE WORLD'S POOR AND THE LANDS WHERE THEY LIVE

BEFORE PROCEEDING TO SUGGEST POLICY RECOMMENDATIONS, I WOULD LIKE FIRST TO MAKE SOME OBSERVATIONS ON THE CONDITION OF THE WORLD'S POOREST PEOPLE, MANY OF WHOM ARE BEING PUSHED INTO ENVIRONMENTALLY FRAGILE AREAS. AS JEFFREY LEONARD NOTES IN ENVIRONMENT AND THE POOR, "POVERTY AND ENVIRONMENTAL DESTRUCTION ARE GROWING MORE AND MORE TO BE INSEPARABLE TWINS IN DEVELOPING COUNTRIES, NOT SO MUCH BECAUSE THE ABSOLUTE NUMBERS OF PEOPLE HAVE GROWN, BUT BECAUSE THE POOREST PEOPLE, WITH ACCESS TO THE LEAST AMOUNT OF INVESTMENT CAPITAL AND TECHNOLOGY, ARE OCCUPYING THE LANDS THAT REQUIRE THE MOST INFRASTRUCTURE, MANAGEMENT AND EXTERNAL INPUTS IF THEIR UTILIZATION IS NOT TO RESULT IN LAND DEGRADATION AND ENVIRONMENTAL DESTRUCTION."

THERE ARE CURRENTLY 700 MILLION PEOPLE WORLDWIDE WHO ARE CHARACTERIZED AS "POOREST." ONLY 250 MILLION OF THESE EVER-INCREASING NUMBERS LIVE IN HIGH-PRODUCTIVITY AGRICULTURAL AREAS. OF THE REMAINING 450 MILLION, 330 MILLION LIVE IN LOW POTENTIAL RURAL AGRICULTURAL AREAS, AND 120 MILLION INHABIT THE URBAN AREAS.

THUS, SIXTY PERCENT--MORE THAN 425 MILLION--OF THE WORLD'S POOREST PEOPLE LIVE IN AREAS OF HIGH ECOLOGICAL VULNERABILITY: ARID OR FORESTED REGIONS WITH LIMITED FERTILITY SOILS, STEEP HILLSIDES, AND URBAN SHANTY TOWNS. THESE PEOPLE EKE OUT A LIVING AT THE LONG-TERM PERIL OF THE ECOSYSTEMS ON WHICH THEY DEPEND.

GROWING PRESSURES ON VULNERABLE FOREST AREAS THREATEN THE EXTINCTION OF PLANT AND ANIMAL SPECIES ESSENTIAL TO THE FOOD CHAIN AND CONTRIBUTE TO THE GLOBAL GREENHOUSE EFFECT. THERE ARE CURRENTLY AROUND 1.2 BILLION HECTARES OF HUMID TROPICAL FORESTS, BUT IT IS ESTIMATED THAT 7.5 MILLION HECTARES ARE CUT DOWN EACH YEAR IN THE DEVELOPING COUNTRIES; TWO-THIRDS OF THIS IS IN ORDER TO RAISE AGRICULTURAL PRODUCTIVITY. THESE VALUABLE FORESTS HAVE BECOME "SAFETY VALVES" FOR POOR PEOPLE WHO ARE EVICTED FROM OTHER MORE HABITABLE AREAS DUE EITHER TO OVERPOPULATION IN THE GOOD AGRICULTURAL AREAS, AS IN INDONESIA, OR THE LIMITED CAPACITY OF URBAN AREAS TO ABSORB RURAL MIGRANTS, AS IN CENTRAL AMERICA. BETWEEN A THIRD AND HALF OF THESE CRUDELY CULTIVATED AREAS DECLINE IN FERTILITY BY MORE THAN 50% IN THE FIRST THREE YEARS OF USAGE. THIS IS IN LARGE PART DUE TO SLASH AND BURN PRACTICES TO CLEAR UNCLAIMED FORESTED LAND FOR URGENTLY NEEDED SUBSISTENCE FOOD CULTIVATION.

IN HILLSIDE AND DRYLAND AREAS, THE PROBLEMS ARE ESPECIALLY SEVERE. GROWING NEEDS FOR FOOD PRODUCTION AND FUELWOOD LEAD TO PRACTICES WHICH CAUSE EROSION AND DESERTIFICATION. THE FAO ESTIMATED IN 1983 THAT 100 MILLION RURAL PEOPLE AND 150 MILLION URBAN DWELLERS SUFFERED FROM ACUTE SHORTAGES OF FUELWOOD DUE TO DEFORESTATION.

THE 120 MILLION VERY POOR LIVING IN URBAN PERIPHERIES ARE THREATENED MOST IMMEDIATELY BY HEALTH PROBLEMS POSED BY THE LACK OF URBAN INFRASTRUCTURE. THEY ARE FORCED TO RELY ON CONTAMINATED WATER SUPPLIES AND BREATHE POLLUTED AIR. THE LACK OF PROPER WASTE DISPOSAL FACILITIES ALSO PUTS THEM AT CONSIDERABLE RISK OF DISEASE. SINCE SHANTY TOWNS ARE OFTEN LOCATED CLOSE TO INDUSTRIAL AREAS, THESE CITY POOR ARE ESPECIALLY THREATENED BY INDUSTRIAL ACCIDENTS, SUCH AS THE UNION CARBIDE CHEMICAL ACCIDENT IN BHOPAL, INDIA; THE PETROL STORAGE EXPLOSION IN MEXICO CITY; AND THE INCINERATION OF A NATURAL GAS PIPELINE IN CUBATAO, BRAZIL. THE FACT THAT BY THE TURN OF THE CENTURY, HALF OF THE WORLD'S POPULATION WILL BE URBAN, AND 18 OUT OF THE 21 LARGEST CITIES WILL BE LOCATED IN THE THIRD WORLD, WILL ONLY EXACERBATE THIS PERILOUS SITUATION.

EVEN PRIME AGRICULTURAL LANDS ARE IN DANGER OF DEGRADATION. ENVIRONMENT AND THE POOR CONCLUDES THAT: "AFTER A GENERATION OF CONSTRUCTING LARGE INFRASTRUCTURAL PROJECTS TO PROMOTE DEVELOPMENT OF HIGH POTENTIAL AGRICULTURAL AREAS IN THE DEVELOPING WORLD, IT IS CLEAR THAT DEVELOPMENT ASSISTANCE AGENCIES AND GOVERNMENTS ARE HAVING INCREASING DIFFICULTY ENSURING THAT THESE PROJECTS--DAMS, IRRIGATION SYSTEMS, ETC.--FULFILL THEIR PRODUCTIVE POTENTIAL ON AN ANNUAL BASIS AND REMAIN IN GOOD REPAIR FOR THEIR EXPECTED LIFETIMES. IN FACT, MANY DEVELOPING COUNTRIES CANNOT MAINTAIN THE PRODUCTIVITY GAINED FROM ALREADY COMPLETED AGRICULTURAL DEVELOPMENT PROJECTS. IN INDIA, PAKISTAN, EGYPT, THE PHILIPPINES, SRI LANKA AND OTHER COUNTRIES, NEARLY AS MUCH IRRIGATED AGRICULTURAL LAND HAS BEEN REMOVED FROM PRODUCTION--AS A RESULT OF

WATERLOGGING AND SALINIZATION OF SOIL--AS HAS BEEN OPENED TO NEW IRRIGATION SCHEMES IN RECENT YEARS."[1] ACCORDING TO FAO ESTIMATES, AS MANY AS 45 MILLION HECTARES OF IRRIGATED LAND IN THE DEVELOPING COUNTRIES REQUIRE RECLAMATION BECAUSE OF SALINITY OR POOR DRAINAGE. THIS ENCOMPASSES NEARLY HALF OF THE 92 MILLION HECTARES OF LAND NOW UNDER IRRIGATION IN THE DEVELOPING WORLD.

ENVIRONMENT AND THE POOR CONCLUDES THAT, "THE STARK REALITY IS THAT UNTIL WELL INTO THE TWENTY-FIRST CENTURY, THE NUMBER OF POOR PEOPLE WITH LITTLE TECHNOLOGY OR INVESTMENT CAPITAL AND NEEDING FIRST AND FOREMOST TO SATISFY THEIR BASIC FOOD NEEDS WILL LIKELY CONTINUE TO INCREASE IN LOW POTENTIAL AGRICULTURAL REGIONS. IN THE QUEST TO MEET SUBSISTENCE, THESE POOR PEOPLE ARE CREATING ENVIRONMENTAL PROBLEMS THAT FURTHER IMPOVERISH THEMSELVES AND THEIR LANDS, THREATENING DOWNSTREAM PRODUCTION IN HIGHER POTENTIAL AREAS AND CONTRIBUTING TO GLOBAL ECOLOGICAL PROBLEMS SUCH AS THE WARMING OF THE EARTH'S CLIMATE AND SPECIES EXTINCTION."

IV. ESSENTIAL MEASURES FOR SUSTAINABLE DEVELOPMENT

THE ESSENTIAL CHALLENGE FOR THE ACHIEVEMENT OF SUSTAINABLE LONG-TERM DEVELOPMENT IS TWOFOLD: FIRST, AGRICULTURAL PRODUCTION MUST BE MAXIMIZED IN HIGH-POTENTIAL AREAS IN A WAY THAT PROTECTS THE ENVIRONMENT. SECOND, THE INCOMES OF THOSE GROWING NUMBERS OF PEOPLE LIVING IN

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[1] LEONARD, P. 36

ECOLOGICALLY FRAGILE AREAS OF LOW AGRICULTURAL POTENTIAL AND IN URBAN PERIPHERIES MUST BE RAISED TO ALLOW THEM TO EARN A LIVELIHOOD IN WAYS THAT DO NOT DESTROY THE ECOSYSTEM ON WHICH THEY DEPEND.

STRATEGIES FOR SUSTAINABLE DEVELOPMENT MUST THEREFORE HAVE AS THEIR FIRST SET OF GOALS INCREASED PRODUCTIVITY IN FERTILE AREAS, ACCOMPANIED BY REDUCED STRESS ON THE ECOSYSTEM; CREATION OF ON-FARM WAGE EMPLOYMENT; AND NONFARM EMPLOYMENT IN ENTERPRISES OF PUBLIC WORKS TO BUILD AND REPAIR INFRASTRUCTURE IN ORDER TO PROMOTE THE FORMATION OF SMALL URBAN CENTERS. THE ESTABLISHMENT OF THESE SMALLER TOWNS IS ESSENTIAL, AS DEMONSTRATED BY THE ODC VOLUME ON STRENGTHENING THE POOR. JOHN P. LEWIS'S OVERVIEW SHOWS THAT IF FOOD PRODUCTION IN THESE AREAS IS TO INCREASE IN BOTH VOLUME AND EFFICIENCY, WORKER PRODUCTIVITY MUST GROW BY TWO TO THREE PERCENT ANNUALLY. EVEN IF AGRICULTURAL OUTPUT ACHIEVES AN OPTIMISTIC GROWTH RATE OF 4 PERCENT, THERE IS ONLY ROOM FOR A 1-2 PERCENT YEARLY EXPANSION OF THE ON-FARM LABOR FORCE.[2]

THE COMBINED GROWTH IN ON-FARM LABOR PRODUCTIVITY AND CONTINUED POPULATION INCREASES WILL THEREFORE ALMOST CERTAINLY MEAN THAT, AT LEAST IN THE MEDIUM TERM, GROWING NUMBERS OF POOR PEOPLE WILL CONTINUE TO BE FORCED ONTO LESS FERTILE AND MORE ECOLOGICALLY FRAGILE LANDS. THUS THE SECOND SET OF PRIORITIES FOR SUSTAINABLE DEVELOPMENT MUST INCLUDE POLICIES AND PROGRAMS TO REACH BEYOND HIGH POTENTIAL AREAS. BUT CONVENTIONAL POLICIES WILL NOT BE ADEQUATE. ENVIRONMENT AND THE POOR

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2 JOHN P. LEWIS, ED., STRENGTHENING THE POOR: WHAT HAVE WE LEARNED? (ODC: 1988), P. 15.

CONCLUDES THAT, "...WHERE DONORS HAVE TRIED TO PROVIDE POOR PEOPLE A BETTER CHANCE TO GET AHEAD BY OPENING UP MORE REMOTE AND LESS FERTILE AREAS FOR MORE INTENSIVE EXPLOITATION--AS IN RESETTLEMENT SCHEMES IN THE TROPICAL FORESTS OF THE AMAZON OR INDONESIA, OR IN LONG RANGE MANAGEMENT SCHEMES IN BOTSWANA OR THE SAHEL--SPECTACULAR FAILURES HAVE OFTEN RESULTED....[D]ESPITE HUNDREDS OF MILLIONS OF DOLLARS SPENT BY INTERNATIONAL DONORS ON FOREST MANAGEMENT, WATERSHED PROTECTION, VILLAGE WOODLOTS, SHELTERBELTS AND OTHER FORMS OF LARGE-SCALE ENVIRONMENTAL IMPROVEMENT PROJECTS, THE RECORD OF FAILURE IN MOST OF AFRICA AND IN DRY AND HILLSIDE AREAS IN ASIA AND LATIN AMERICA IS STILL EXTRAORDINARILY HIGH."[5] THUS THE CHALLENGE TO DONORS IS TO FIND BETTER WAYS OF SUPPORTING NUMEROUS SMALL-SCALE PROJECTS WHICH ALLOW FOR ASSESSMENT OF PARTICULAR ENVIRONMENTAL CONDITIONS AND TO WORK WITH NGOS TO PROMOTE THE DUPLICATION OF SMALL-SCALE, SUCCESSFULLY "TAILORED" EFFORTS IN A COORDINATED FRAMEWORK, PERHAPS THROUGH THE MULTILATERAL DEVELOPMENT BANKS.

IT IS WORTH NOTING THAT A STRATEGY WHICH PAYS CLOSE ATTENTION TO SPECIFIC ECOLOGICAL ZONES IS ESSENTIAL FOR CASH CROPPING AS WELL. ALTHOUGH MANY ENVIRONMENTALISTS OPPOSE MARKET-ORIENTED AGRICULTURE FOR VERY GOOD REASONS RELATED TO STRESS ON SOILS FROM OVERCROPPING, THE PATHWAY TO ECONOMIC SUCCESS FOR THE SMALL FARMER MAY OFTEN BE A DIVERSIFIED STRATEGY WHICH COMBINES FOOD PRODUCTION FOR LOCAL CONSUMPTION WITH CERTAIN KINDS OF MARKET CROPPING. MANY CASH CROPS, SUCH AS COFFEE, NUTS, COCOA AND RUBBER, CAN ACTUALLY HELP TO PREVENT EROSION, SINCE THEY

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[5] LEONARD, P. 47, 51.

ARE PERENNIAL BUSHES AND TREES. BUT EFFICIENT AND BENEFICIAL "CASH CROPPING" REQUIRES ELABORATION AND EXTENSION OF INFRASTRUCTURE, THE AVAILABILITY AND QUALITY OF WHICH, IN THE FORM OF ROADS, CANALS, TERRACES AND ELECTRICITY, IS ESSENTIAL TO SUSTAINABLE AGRICULTURAL DEVELOPMENT AND SOUND LAND USE.

V. U.S. AND INTERNATIONAL POLICY MEASURES TOWARD DEBT REDUCTION, POVERTY ALLEVIATION, SUSTAINED GROWTH, AND ENVIRONMENTAL PROTECTION

THE POLICIES OF THE UNITED STATES AND OTHER DONOR NATIONS, AS WELL AS THOSE OF THE MULTILATERAL DEVELOPMENT BANKS, MUST RESPOND TO CHALLENGES POSED BY THE COMPLEX ISSUE INTERRELATIONSHIPS OF A NEW GLOBAL AGENDA WHICH SEEKS AT ONCE TO ELIMINATE POVERTY AND SUSTAIN THE ENVIRONMENT.

FIRST OF ALL, THE DEBT CRISIS MUST TAKE PRIORITY IN U.S. RELATIONS WITH THE THIRD WORLD. THE FIRST STEP HAS ALREADY BEEN TAKEN, IN THE FORM OF THE BRADY PLAN, TOWARD THE ESTABLISHMENT OF A GLOBALLY COORDINATED, U.S.-LED DEBT POLICY. CONCRETE ACTION ON THE BRADY PROPOSALS IS ESSENTIAL TO PROGRESS IN THE DEBTOR COUNTRIES. RAISING ERODED PURCHASING POWER AND INCREASING THE AVAILABILITY OF INVESTMENT CAPITAL IS THE BASIC FOUNDATION FOR RENEWED GROWTH IN THE DEVELOPING WORLD. FOCUSSING ON MACROECONOMIC ADJUSTMENT MEASURES, THE WORLD BANK'S POLICY UNTIL THE MID-1980S, WAS MOTIVATED BY THE BELIEF THAT GROWTH WOULD EVENTUALLY REVIVE, AND WHEN IT DID, PROGRESS TOWARD THE ELIMINATION OF POVERTY WOULD RESUME.

HOWEVER, AS RECOGNIZED BY THE DEVELOPMENT COMMITTEE OF THE WORLD BANK, IT WAS EVIDENT BY THE MID-1980S THAT IT HAD BECOME "MORALLY, POLITICALLY, AND ECONOMICALLY UNACCEPTABLE" TO POSTPONE THE FIGHT AGAINST POVERTY. ALTHOUGH SOME POOR PEOPLE DID BENEFIT FROM ADJUSTMENT PROGRAMS, MANY VULNERABLE GROUPS INEVITABLY SUFFERED AS AUSTERITY REDUCED THE AVAILABILITY AND AFFORDABILITY OF SOCIAL SERVICES, ERODED REAL INCOME, AND REDUCED PUBLIC SECTOR EMPLOYMENT.[4] NOT ONLY DID THIS LEAD TO POLITICAL UNREST, BUT, IN PART DUE TO THIS POLITICAL UPHEAVAL, IT REDUCED FOREIGN AND DOMESTIC BUSINESS CONFIDENCE NEEDED TO EXPAND THE PRIVATE SECTOR AND REDUCE PUBLIC SECTOR INVOLVEMENT.[5] THE CONTINUED GROWTH OF THE DEBT BURDENS OF THE AFFECTED COUNTRIES, DESPITE CONSIDERABLE ECONOMIC REFORM, HAS MADE IT EVIDENT THAT MORE FORCEFUL AND BETTER COORDINATED POLICIES ARE NEEDED.

MY COLLEAGUE, RICHARD E. FEINBERG HAS OUTLINED FIVE CRITERIA THAT ANY NEW DEBT POLICY MUST SATISFY:[6]

1) NET RESOURCE TRANSFERS SHOULD FOLLOW GROWTH TARGETS, AND THE WORLD BANK AND THE IMF SHOULD SET COUNTRY TARGETS FOR NEW LENDING AND DEBT RESTRUCTURING THAT LEAVE ENOUGH CAPITAL IN THE LDCS TO PERMIT ADEQUATE INVESTMENT AND GROWTH.

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[4] STRENGTHENING EFFORTS TO REDUCE POVERTY, DEVELOPMENT COMMITTEE NO. 19 (WORLD BANK/IMF), P.4.

[5] JOAN NELSON, P. 4.

[6] RICHARD E. FEINBERG, THIRD WORLD DEBT AND DEVELOPMENT: WORLD BANK AND INTERNATIONAL MONETARY FUND, SUMMARY OF RECOMMENDATIONS: "AMERICA IN TRANSITION: BLUEPRINTS FOR THE 1990S," P. 177.

2) COUNTRIES SHOULD BE TREATED ON A TRULY CASE-BY-CASE BASIS. SOME NATIONS HAVE A STRONG EXPORT BASE THAT PERMITS THEM TO MEET INTEREST REQUIREMENTS AND REACH GROWTH TARGETS, WHILE OTHERS ARE IN NEED OF DEBT SERVICE RELIEF, EITHER TEMPORARY OR PERMANENT.

3) DEBTOR NATIONS SHOULD PURSUE ECONOMIC REFORMS THAT PROMOTE EQUITY AND EFFICIENCY. TO ENCOURAGE THIS, THE WORLD BANK AND THE IMF SHOULD STRESS DISTRIBUTION OF DOMESTIC COSTS AND BENEFITS OF THE ADJUSTMENT PROGRAMS THEY FORMULATE.

4) ROUGHLY EQUIVALENT CONTRIBUTIONS SHOULD BE EXPECTED FROM ALL CREDITORS. EACH CREDITOR WOULD CHOOSE WHETHER TO PROVIDE NEW MONIES OR REDUCE DEBT SERVICE REQUIREMENTS.

5) ALL PARTIES TO THE DEBT CRISIS, DEBTORS AND CREDITORS ALIKE, SHOULD PARTICIPATE IN DESIGNING THE NEW POLICY FRAMEWORK.

OFFICIAL DEBT RELIEF IN AFRICA IS ONE AREA THAT WOULD NOT INVOLVE SUBSTANTIAL NEW RESOURCE COMMITMENTS BY THE UNITED STATES. UNLIKE LATIN AMERICAN DEBTORS, AFRICAN COUNTRIES HAVE BORROWED FAR MORE HEAVILY FROM GOVERNMENTS THAN FROM THE COMMERCIAL BANKS. AS OF 1987, SUB-SAHARAN AFRICA'S OFFICIAL DEBT OWED THE U.S. AMOUNTED TO $4,267.2 MILLION, $3,441.7 MILLION OF WHICH WAS OWED BY THE POOREST COUNTRIES. THE 1988

DEBT SERVICE BURDEN OF THESE LOW-INCOME COUNTRIES WAS $341.6 MILLION.[7] SINCE THESE OFFICIAL LOANS WERE ORIGINALLY MADE TO FOSTER DEVELOPMENT, IT WOULD MAKE GOOD SENSE TO MOVE TO REPAYMENT IN LOCAL CURRENCY AND MAKE FUNDS AVAILABLE FOR ANTI-POVERTY AND ENVIRONMENTAL PROGRAMS. OTHER OECD DONORS, WHO HAVE LENT MUCH LARGER AMOUNTS THAN THE U.S., ALREADY HAVE TAKEN STEPS TOWARD DEBT RELIEF. MOST RECENTLY, FRENCH PRESIDENT FRANCOIS MITTERRAND PLEDGED FORGIVENESS OF A TOTAL OF $2.35 MILLION OWED BY THE 35 POOREST AFRICAN COUNTRIES. WEST GERMANY ALSO HAS WRITTEN OFF LARGE AMOUNTS OF DEBT OVER THE PAST FEW YEARS.

CONTINUING INTERNATIONAL ECONOMIC STAGNATION AND THE PERSISTENTLY MOUNTING DEBT OF THE DEVELOPING COUNTRIES HAS DEMONSTRATED THE NEED FOR INNOVATIVE MEASURES TO DEAL WITH THE DEBT CRISIS. THE PROPOSALS PUT FORTH BY SECRETARY BRADY OFFER SEVERAL NON-TRADITIONAL WAYS OF PROVIDING CAPITAL, SUCH AS DEBT FOR EQUITY SWAPS, BUYBACKS, AND DEBT SECURITIZATION.

DEBT-FOR-NATURE OR DEBT-FOR-DEVELOPMENT SWAPS, IN WHICH AN INTERNATIONAL ENVIRONMENTAL GROUP, FOR EXAMPLE, PURCHASES A BLOCK OF DEEPLY DISCOUNTED THIRD WORLD DEBT AND CONVERTS IT INTO LOCAL CURRENCY IN ORDER TO PURCHASE PRIVATE OR GOVERNMENT-OWNED LANDS AND TURN THEM INTO NATIONAL PARKS OR TO FUND ENVIRONMENTALLY BENEFICIAL ACTIVITIES, ARE PROMISING AND INTERESTING, BUT THEY ARE FAR FROM A PANACEA. IN ADDITION, AN EXCLUSIVE FOCUS ON THESE MEASURES RISKS DIVERTING ATTENTION AWAY FROM

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[7] MAURICE WILLIAMS, "AFRICA'S RECOVERY AND DEVELOPMENT," ODC POLICY FOCUS NO. 4, 1988, P. 9

THE COMPREHENSIVE DEBT PROBLEMS OF LATIN AMERICA AND AFRICA. DEBT-FOR-ENVIRONMENT SWAPS WILL REMAIN A SMALL BUT PROMISING PART OF THE OVERALL SOLUTION.

IT IS ALSO IMPORTANT TO EMPHASIZE THAT THE COMPELLING RATIONALE FOR DEBT FORGIVENESS IS A NECESSARY, BUT FAR FROM SUFFICIENT CONDITION FOR PROGRESS TOWARD TRULY SUSTAINABLE DEVELOPMENT. EVEN IF NEW RESOURCES LEAD TO GROWTH RATES WHICH MATCH THE LEVELS ACHIEVED IN THE 1970s, THE NUMBERS OF PEOPLE LIVING IN ABSOLUTE POVERTY COULD NOT BE REDUCED TO THE LEVELS OF THAT PERIOD UNTIL THE MIDDLE OF THE NEXT CENTURY. AND POVERTY ALLEVIATION THROUGH RAPID INDUSTRIALIZATION ALONG TRADITIONAL PATHS USING CONVENTIONAL ENERGY SOURCES SUCH AS FOSSIL FUELS COULD PROVE TO BE DEVASTATING TO THE ENVIRONMENT. FOR EXAMPLE, IF CHINA AND ITS HUGE POPULATION WERE TO FOLLOW THE SAME DEVELOPMENT MODEL AS TAIWAN, THE POLLUTION FROM FUEL BURNING WOULD BE TREMENDOUS. THE JAPANESE ISLANDS ARE ALREADY BEING AFFECTED BY COAL BURNING IN CHINA. THE THREAT OF AN INCREASING NUMBER OF SITUATIONS SUCH AS THIS MAKES IT NECESSARY TO GIVE PRIORITY TO CREATING A MANDATE FOR THE PROVISION OF CLEANER ENERGY TECHNOLOGY TO THE DEVELOPING COUNTRIES BY DONOR NATIONS AND ORGANIZATIONS.

ONE CENTRAL QUESTION IS HOW THE UNITED STATES CAN USE AVAILABLE POLICY LEVERS, IN PARTICULAR U.S. FOREIGN AID PROGRAMS, TO PROMOTE SUSTAINABLE DEVELOPMENT. IF THE PRINCIPAL GOAL OF U.S. DEVELOPMENT POLICY SHOULD BE TO PROMOTE SUSTAINABLE LONG-TERM DEVELOPMENT AND RENEWED GROWTH IN THE THIRD WORLD, A REASSESSMENT OF CURRENT DEVELOPMENT

PRIORITIES, STARTING WITH A REDIRECTION OF THE RESOURCES AVAILABLE THROUGH THE U.S. INTERNATIONAL AFFAIRS BUDGET, IS ABSOLUTELY ESSENTIAL.

THE CURRENT U.S. AID PROGRAM IS BIASED HEAVILY TOWARD PERCEIVED MILITARY AND SECURITY INTERESTS, WHILE PROGRAMS WHICH ADDRESS POVERTY AND THE ENVIRONMENT ARE ACCORDED A SHAMEFULLY LOW LEVEL OF IMPORTANCE AND FUNDING. DURING THE FIRST HALF OF THIS DECADE, THE FOREIGN AID BUDGET APPROVED BY THE CONGRESS MORE THAN DOUBLED, BUT THE INCREASED ALLOCATIONS WENT EXCLUSIVELY TO MILITARY AND SECURITY PROGRAMS. DEVELOPMENT AID ACTUALLY DECREASED.

THE TOTAL U.S. AID BUDGET HAS DROPPED OVER THE PAST FEW YEARS, AS PART OF THE OVERRIDING NEED TO REDUCE THE FEDERAL BUDGET DEFICIT, BUT THE TOTAL REMAINS HIGH--OVER $14 BILLION FOR FY 1990.

OF THE $14.5 BILLION THE ADMINISTRATION HAS REQUESTED IN FOREIGN AID IN FY 1990, $9.1 BILLION, 63%, WILL GO FOR MILITARY AND SECURITY ASSISTANCE. U.S. ASSISTANCE NOW IS HEAVILY CONCENTRATED IN A FEW BETTER-OFF COUNTRIES IN THE MIDDLE EAST, CENTRAL AMERICA, SOUTHERN EUROPE, AND PAKISTAN. SOME OF THESE FUNDS SUPPORT PROGRAMS THAT PROMOTE SUSTAINABLE DEVELOPMENT, BUT THEY ACCOUNT FOR ONLY A SMALL PERCENTAGE OF THE TOTAL. FOR INSTANCE, THE BUDGET REQUESTED BY THE AGENCY FOR INTERNATIONAL DEVELOPMENT (AID) INCLUDES ONLY $607 MILLION FOR PROJECTS IN AGRICULTURE, RURAL DEVELOPMENT, POPULATION, ENVIRONMENT, AND ENERGY.

FURTHERMORE, ONLY A SMALL PART OF U.S. GRANT ASSISTANCE IS ALLOCATED TO THE POOREST COUNTRIES. THE SHARE OF U.S. AID ALLOCATED TO THE LOW INCOME COUNTRIES (LICs) IS A ONLY 24%, COMPARED TO THE OVERALL OECD AVERAGE OF 40%. THE NEED FOR THE SHIFT TO THE LICs CAN BE COMPARED TO THE IMPORTANCE OF PRESERVING A DOMESTIC "SAFETY NET" FOR DISADVANTAGED GROUPS IN OUR OWN SOCIETY, EVEN IN THE FACE OF ECONOMIC ADVERSITY.

IT IS CLEAR THAT THE U.S. AID BUDGET WILL NOT INCREASE UNTIL CONGRESS AND THE EXECUTIVE BRANCH REACH AGREEMENT ON MEASURES TO REDUCE THE OVERALL FEDERAL BUDGET DEFICIT. POLICYMAKERS CONCERNED ABOUT SUSTAINABLE DEVELOPMENT, THEREFORE, ARE FACED WITH VERY TOUGH CHOICES ABOUT REALLOCATING SOME PORTION OF THE CURRENT BUDGET IN ORDER TO GIVE MORE PRIORITY TO PROGRAMS DESIGNED TO ELIMINATE POVERTY AND SUSTAIN THE ENVIRONMENT. FOR INSTANCE, AN ADDITIONAL $1 BILLION COULD BE FOUND FOR SUSTAINABLE DEVELOPMENT BY REALLOCATING ONLY 11 PERCENT OF THE AMOUNT REQUESTED FOR INTERNATIONAL SECURITY ASSISTANCE. THE IMPACT ON THIS COUNTRY'S MILITARY SECURITY WOULD PROBABLY BE NEGLIGIBLE, BUT THE RETURNS TO SUSTAINABLE DEVELOPMENT COULD BE CONSIDERABLE.

THE NEED TO REDIRECT PRIORITIES IN EXISTING U.S.AID POLICIES IS MADE EVEN MORE URGENT BY THE FACT THAT THE UNITED STATES IS NO LONGER THE DOMINANT DONOR OF DEVELOPMENT ASSISTANCE. THERE NOW ARE MANY MORE COUNTRIES IN THE AID BUSINESS, AND THE U.S. IS LIKELY TO BE SURPASSED BY JAPAN AS THE LARGEST PROVIDER OF DEVELOPMENT ASSISTANCE IN THE NEAR FUTURE. AS A RESULT THE UNITED STATES IS NO LONGER IN A POSITION WHERE IT CAN SET THE AGENDA OF ISSUES FOR DEVELOPMENT COOPERATION BY THE SHEER

SIZE OF ITS PROGRAM; RATHER IT MUST LEAD BY EXAMPLE AND SEEK TO INFLUENCE HOW A LARGE NUMBER OF OTHER DONORS ALLOCATE THEIR RESOURCES. IN OTHER WORDS, WE NEED AN AID PROGRAM THAT IS "SMARTER."[8]

FINALLY AND PERHAPS MOST IMPORTANTLY, EFFORTS TO PROMOTE SUSTAINABLE DEVELOPMENT MUST BE CARRIED OUT IN A WAY THAT HELPS THE DEVELOPING COUNTRIES TAKE CONTROL OF THEIR OWN FUTURES IN A SHARED GLOBAL ECONOMY AND ENVIRONMENT. UNLESS BOTH DEVELOPED AND DEVELOPING COUNTRIES GIVE PRIORITY TO POLICIES DESIGNED TO RESTORE GROWTH, REPAIR AND SUSTAIN THE ENVIRONMENT, AND ELIMINATE POVERTY, THE NUMBERS OF THE POOR WILL GROW AND THE RATE OF ENVIRONMENTAL DESTRUCTION WILL CONTINUE TO THREATEN THE ENTIRE PLANET. WE WILL ALL PAY THE COSTS IF THIS COMES TO PASS.

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8 THESE IDEAS ARE EXPANDED UPON IN THE REPORT WHICH THE OVERSEAS DEVELOPMENT COUNCIL PREPARED AT THE REQUEST OF THE TASK FORCE ON FOREIGN AID OF THE HOUSE FOREIGN AFFAIRS COMMITTEE AND IN "FOREIGN AID AND GRAMM-RUDMAN," BY JOHN W. SEWELL AND CHRISTINE E. CONTEE IN FOREIGN AFFAIRS, SUMMER 1987.

Representative SCHEUER. Well, thank you very much, Mr. Sewell.

This is the second bell on our rollcall vote, and I am going to have to catch it. So I am going to recess for about 15 minutes.

When I come back, after we hear Mr. Bissell and Mr. Dale, we will have some questions. One of the questions that I want to ask you all is, since Japan is emerging as a powerful force in the Third World aid arena, what kind of quiet advice and counsel can we give to Japan as to how to structure a role, perhaps more creatively than it is now, and perhaps more in a way that is more sensitive to the needs of the countries that she is helping. OK?

[Whereupon, at 3:14 p.m., there ensued a brief recess.]

Representative SCHEUER. The subcommittee will come to order.

Mr. Bissell, you are next. Your reputation as a thoughtful and enlightened economist in the field of international banking and trade has long preceded you. You have been long on the scene, and have been a very thoughtful and creative voice. We are looking forward to hearing you.

Please take your 10 minutes and chat with us.

STATEMENT OF RICHARD E. BISSELL, ASSISTANT ADMINISTRATOR, BUREAU FOR PROGRAM AND POLICY COORDINATION, AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. BISSELL. Thank you, Congressman.

I have submitted a prepared statement for the record, and I appreciate your putting that in.

Representative SCHEUER. It will be printed in full in the record.

Mr. BISSELL. It is frustrating to follow two articulate witnesses like John Sewell and Barbara Bramble, because much of what they said overlaps with what I want to say. So let me make a couple of general points that I think may be useful in our conversation today.

We need to distinguish in our treatment of the debt issue between its short-term effects and its long-term effects. I know that "debt" is a four-letter word, but it does not mean that debt is always a bad thing. Our experience of the last decade has cast an ominous shadow over the whole existence of debt among the less-developed countries.

That is in part because we recognize that the short-term effects of servicing that debt have been enormous. They have been enormous not only in the traditional measures that we look at, which are the effects upon poverty, particularly in the least-developed countries, but also upon the environment, which we are increasingly able to measure, although only in recent years.

We are only slowly becoming able to measure the resource bases, becoming able to measure changes in those resource bases in relation to overall economic development, to the debt situation, to the availability of investment capital and the way in which any particular less-developed country deploys its economic assets.

But on either score, however well we can measure it, we are deeply concerned with the short-term effects, and have found over the last 5 years in particular that the flexibility of those developing country governments to respond to development opportunities have become increasingly restricted.

Our possibilities of working with them are also restricted, as they find that additional and a growing percentage of their resources are devoted to debt service, whether commercial or official.

That is why we are attempting to take a number of steps to deal with the short-term effects of debt, both in terms of the debt as well as alleviating the effects upon both the poorest of the population and upon the environment. Many of those steps are sketched out in my prepared statement, and I will not repeat them here.

Let me try to distinguish that from what I think is also important to consider, which is the long-term role of debt in the life of economic development.

We should not forget that the United States was piling up net foreign debt for the first 300 years of our existence; it was only in the early part of the 20th century that we began to turn that around.

There was an inflow of investment capital in the United States throughout the first three centuries that we recognized as a very positive thing, and that we sought out, because it was going into true investments. It was not going into flight capital as is being experienced in many developing countries today. We were in a phase of economic development where we could put that debt, or investment capital, to good use.

As we look beyond the short-term problems that we are going to have to face one way or another—and here, I am talking about the 1990's as well as the 21st century—we have to ensure that we are working with the developing countries so that they are in a position to raise capital through debt mechanisms over the long term. We need to ensure that what we do today does not impair their ability to do so, as we attempt to deal with short-term debt problems, this debt crisis that they face.

And I say that not only in regard to broad-scale development efforts, but also as a member of the U.S. Government. Resource flows for economic development in the long term will not come primarily from foreign assistance. They will come from export earnings. They will come from investment flows. They will come from a range of sources in which U.S. development assistance will play a relatively small part.

We need to keep that in mind as we think about the debt problem. That is, we are talking about an issue which has its short-term aspects, but also it has issues of long-term creditworthiness, of the ability of those countries as they see beyond their current problems to be able to continue their economic development in the future.

The second issue—I will take up the point you raised before the break for the vote—is the question of Japan. This is one that has concerned me greatly, personally, because I have coordinated the dialog between AID and the Japanese aid agencies over the last 3 years, in which issues of sustainable development have played an increasing role.

As the Japanese program has grown steadily, so it has been recognized that their influence upon overall development trends has increased correspondingly.

This is true both with regard to their attitude toward antipoverty programs, as well as environmental programs, and indeed the

general emphasis that one would see in putting together a development program.

Representative SCHEUER. You say that their influence has increased?

Mr. BISSELL. It has increased considerably, just by sheer weight.

In the course of the United States-Japan dialog, we have looked at it as holding great potential, and that small steps have been undertaken to focus the Japanese program in a positive direction.

For instance, the issue of the environment among the bilateral donors has taken on increasing importance, and this month we are holding the first meeting at the Development Assistance Committee in Paris of the Working Group on the Environment, which has just been established.

This group was established in recognition of the fact that, despite a decision that we would not have additional working groups, the environment was sufficiently important that we needed to establish such a group. And Japan, of course, will be involved in that.

Second, is a dialog both multilaterally and bilaterally with Japan about the role of capital projects in a development program. Capital projects have evoked great sensitivity because of the ability of, say, a large hydroelectric installation or large transport projects, to affect the physical environment. It has been a sensitive issue with regard to where the multilateral development banks are going. And in the Japanese program, capital projects play a very large role. If, in fact, the Japanese aid program is able to incorporate the kind of environmental sensitivity that we have been trying to build into our own, its ability to influence their choice, indeed the decision to even have certain types of capital projects, can be a very powerful one.

And given the large-scale financing they have available and will have available, I think they can affect the entire focus of capital projects among donors, whether multilateral or bilateral.

There is a good deal of potential in the Japanese aid program. Not a great deal of progress has been made to date, but it seems to me that the dialog has been established for us to make some progress in the coming years.

Thank you.

[The prepared statement of Mr. Bissell follows:]

PREPARED STATEMENT OF RICHARD E. BISSELL

I. INTRODUCTION

Mr. Chairman, members of the Committee, it is a pleasure to appear before you today to discuss the effects of the debt crisis on economic development. Many developing nations have accumulated large foreign debts as a means of obtaining additional resources, which have been used to expand production and exports. These nations now enjoy sustained development, and they service their foreign debt without difficulty. Thailand, Malaysia, Singapore, and the Republic of South Korea are all cases in point. But other developing nations are having great difficulty servicing their debt. Those difficulties are interfering with development. We are concerned about this problem. It is important that we look not just at the problem of the debt service but also at the causes that created the problem.

Two principles form the backdrop for our consideration of developing country debt. First, to increase output to its potential, a country must implement policies that maximize the efficiency with which existing resources are used. Second, to increase its production potential, a country must add to its total resources or introduce technological improvements.

A.I.D.'s strategy in helping raise living standards is based on promoting sustainable growth. We do this through the provision of dollars -- which help finance imports of goods and services -- and through policy dialogue.

The dollars furnished by the United States help pay for imports that add to developing nations' resources. Sometimes -- as with refugee assistance, for example -- the emphasis is on imports that increase consumption. More often, priority is given to imports that enhance technological change or add to investments that facilitate economic growth. A.I.D. finances real resource transfers because they enable LDCs to achieve a

higher standard of living either immediately through increased consumption or, more often, indirectly by improving the technology, strengthening the institutions, and adding to the physical and human capital stocks that produce growth.

A.I.D. emphasizes policy reform because policy environments which encourage inefficiency will inhibit growth and slow the development process. Through policy dialogue, we negotiate policy changes with host government officials that will improve the efficiency with which resources are used. These reforms are successful when they induce LDC governments, large private firms, and individuals -- including farmers and small business owners -- to make decisions at the macroeconomic, sectoral, and project levels that improve market efficiencies. Successful policy shifts toward the private sector result in growth in exports, greater levels of private foreign investment, and a growth in domestic saving and investment. When such policies are in place, sustained and broadly based economic development follows.

To be sure, A.I.D. resource transfers are relatively small. In most developing countries, imports must be paid for with export revenues, with some help from private lending and direct investment. Since private investors, when guided by market forces, are inclined to make efficient investments that will contribute to growth, A.I.D. urges policies that encourage private investment. Since exports must become the principal means of financing imports if countries are to achieve sustained growth, A.I.D. also urges policies that encourage export growth.

The larger point about both resources and policies is that a nation's development depends primarily upon decisions made by the nation's own people. We in the world community are important principally to the extent that we provide an expanding open world market. We also help by providing commercial loans, private foreign investment, and concessional assistance. But decisions within each developing nation determine the extent to which that nation makes good use of its resources, including the efficient use and protection of the long-term productivity of its natural resources, and responds to international trading opportunities. Obviously some developing nations have done much better than others. The stark contrast between the development experiences of two tropical islands, Cuba and Taiwan, both largely cut off from the adjacent land mass, are good examples. Our objective is to assist more nations to create economies like that of Taiwan. Given the special concerns of these hearings, I would add that A.I.D.'s own policies and our policy dialogue are directed at helping each host government to implement policy packages that demonstrate appropriate concern for natural resources in the long run.

II. THE IMPACT OF DEBT SERVICE OBLIGATIONS

Historically, young developing nations -- like young couples -- tend to be borrowers. Developing nations borrow to obtain more imports. This works out well if borrowers enhance their productive resources sufficiently to provide for both debt service and economic growth. People in developed nations lend to developing nations to obtain the higher rates of return available there. Unfortunately, both borrowers and lenders committed errors of judgment and perception during the 1970s and early 1980s. Borrowing -- and lending -- exceeded levels that could be serviced on the original schedules or, in some cases, on any revised schedules.

By definition, when debt service is paid, the foreign exchange available to pay for imports is cut. Less will be available for domestic investment and consumption. For this reason, the large debt service obligations and the arrearages of the developing nations are of great concern to A.I.D.

III. CURRENT U.S. DEBT RELIEF AND LENDING POLICIES

If a nation's debt service obligations are reduced, more foreign exchange is available for other uses. The freed foreign exchange can be used to obtain more imports. If the country's policy environment supports rapid growth, the resources could be used effectively. But something very different can happen -- and often has happened. We have witnessed many cases in which debt-financed increases in imports have brought immediate increases in welfare and a temporary illusion of growth, if the policy environment disguises inefficiency and suppresses market forces.

To avoid repeating those cases, the United States has adopted and is implementing a set of policies that address the root causes of nations' present difficulties in servicing debt. We want to concentrate debt relief and economic assistance where economic policies support sustained development. The United States provides debt relief only where the debtor nation is implementing macroeconomic and sectoral economic policies that encourage efficient resource use and sustainable growth.

The Paris Club is the principal institution through which we implement this policy. As a rule, we participate in arrangements to reschedule official bilateral debt only in concert with other major official creditors and only after the debtor government has agreed to implement -- and is seen to be implementing -- an appropriate economic policy package under the auspices of the International Monetary Fund. In this

context, "appropriate policies" means the kind of market-oriented, outward-looking policies that experience has taught us will produce self-sustaining and broadly based development.

Section 572 of the FY 1989 Foreign Operations Act authorizes several forms of relief on Economic Support Fund and Development Assistance debts of sub-Saharan African and "relatively least developed" countries with Fund or World Bank supported structural adjustment programs. A.I.D. has played a leading role in interagency deliberations of the implications of implementing that provision.

Our policy is to concentrate our development assistance in places where economic policies are oriented toward the private sector and and so give some assurances that our resources will be used efficiently. To implement this policy, we have increased the role of program aid. Program aid provides quick-disbursing assistance conditioned, where our political and strategic interests permit, on specified economic policy reforms. A.I.D. is now delivering such conditioned assistance in many countries in Africa, Asia and Latin America.

In Africa, in 1985, A.I.D. introduced the African Economic Policy Reform Program to give maximum scope for case-by-case decisions on the most productive form of resource transfers and on the most significant policy improvements accessible through A.I.D. activities. Observing the success of that program, Congress created the Development Fund for Africa and so greatly improved the ability of A.I.D., through its resident missions, to tailor resource allocations to meet local development needs and to influence government economic policies. I believe this innovation is increasing A.I.D.'s effectiveness in Africa. I very much hope that, in new foreign assistance legislation, Congress will extend the DFA concept to the rest of A.I.D.'s programs and thus increase the possibilities for more effective assistance, including policy dialogues.

I have been concentrating on program assistance as a means to get policy reforms that will strengthen debtors' ability to grow and to service debt. To avoid any obscurity or misunderstanding, let me elaborate here on the role of program assistance in adding to recipient nations' productive resources. When the United States provides either project or program assistance, we make a resource transfer that increases the real resources available for consumption and investment in the recipient nation. Generally, those resources are delivered faster through program assistance than they could be delivered through project aid. Program aid resources have an ability to add more quickly and directly to growth and to the country's ability to service debt.

III. COORDINATION AMONG DONORS AND CREDITORS

The United States has long coordinated its foreign assistance activities with those of other nations, participating in multinational consultative groups and round tables. It participated in the first multi-creditor Paris Club rescheduling, that of Argentina in 1956-57. Partly to deal with debt servicing problems, the character and extent of cooperation among official donors, official creditors, and multilateral financial institutions has been strengthened duirng the 1980s. Most of these improvements in cooperation have followed from a shared conviction that debt servicing problems and reduced growth rates were caused in large part by inappropriate policies.

In the Paris Club, creditors have always conditioned rescheduling on policy reforms that would strengthen a debtor's ability to service its foreign debt. I do not think there is any doubt that this is the right way to handle the rescheduling of official debt. As you know, we have been flexible in defining and applying Paris Club rules. We have recently begun implementing more generous terms for deeply indebted low-income countries with structural adjustment programs in effect.

The Baker Plan for middle-income debt-distressed countries carried us through the years 1986-88. Growth rates were negligible or negative in many of those countries for much of that time, but the integrity of the international financial community was not compromised. Secretary Baker had proposed cooperation among debtors, bilateral creditors, and private and multilateral financial institutions with emphasis on new lending and on economic policy reforms. We must now conclude that economic policy reform was inadequate in most of these countries, as were new loans from commercial banks. Bolivia should be singled out as a nation within this group which has a strong record on policy reform, but where good domestic policies are not always enough. While Bolivia remains a very poor country, Bolivians would certainly be far worse off today if they had not implemented policy reforms which, in part, cushioned the effects of the downturn in tin and natural gas prices.

The Brady Plan signals a new phase in the response of the industrialized nations and financial institutions to the debt servicing problems of particular middle-income nations. In contrast with the Baker Plan's emphasis on continued servicing of foreign debt, the Brady Plan's emphasis is on means to reduce such debt. In perfect concert with Baker Plan assumptions, the Brady Plan reaffirms the essential importance of appropriate economic policies to encourage savings, investment, return of capital flight and new foreign investment. Rather than stress increased lending, the Brady initiative calls for commercial banks to negotiate debt reductions while the World Bank and the IMF are to devise arrangements, some involving use of Fund and Bank money, to encourage those reductions. A.I.D. strongly supports the Brady Plan and looks forward to its implementation.

For the low-income countries, A.I.D. and the World Bank have introduced new programs which condition resource transfers on policy reforms. The Bank has done so with Structural and Sector Adjustment lending, particularly in Africa. Through the Special Program for Africa, the Bank has been able to focus more of its own and other donor resources on the adjustment programs of low-income, debt-distressed African countries. We hope to make further progress in concentrating IDA assistance in countries where economic policy environments are superior.

In recent replenishment agreements, other multilateral institutions, such as the African Development Bank and the Inter-American Development Bank, have agreed to intensify their own support for adjustment efforts in close coordination with the World Bank.

With strong U.S. backing, the IMF has introduced the Structural Adjustment Facility and the Enhanced Structural Adjustment Facility. Funds are being provided from these two facilities only to nations with economic policy frameworks acceptable to both the Bank and the Fund.

These various activities mean that cooperation among host governments, multilateral institutions, and bilateral donors is better than ever before. We welcome these improvements and are working to make the most of them in support of both policy reforms and well-directed resource transfers. Nevertheless, bilateral donors continue to yield at times to pressure groups seeking support for assistance to exports of less than optimal value to developing nations. We are right to resist those pressures and to urge others to do so.

Both the bilateral donors and the multilateral financial institutions may have been lax in the past regarding the environmental implications of projects and particular host country policies. If so, that laxity has been corrected. The World Bank, as well as the regional development banks, are now taking measures to identify and address the environmental implications of their activities. A.I.D. is carrying out its commitment to make sure that its projects are designed to conserve the productivity of natural resources for the long term and to make sound decisions on environmental questions.

IV. DEBT FOR NATURE SWAPS

A promising mechanism for debt relief which we are pursuing involves debt-for-development activities. In the standard paradigm, a non-government organization (NGO) pays dollars for discounted bank debt. The debt obligations are then exchanged for local currency from the guaranteeing government. The country's debt is thereby reduced without use of foreign exchange, and the NGO is able to use the local currency for development purposes. The types of development activities financed through local currencies can include projects to protect or strengthen natural resource productivity or diversity.

We have provided funds to non-government organizations to engage in such swaps for projects featuring environmental concerns. These transactions provide the NGOs with more local currency per A.I.D. dollar than they could obtain at official exchange rates.

In February of this year, A.I.D. sent its missions guidelines for A.I.D. financing of debt exchanges. This is our "Debt for Development Initiative." A.I.D. missions have the authority to implement debt-for-development transactions, including those deserving the special designation of "debt-for-nature." For example, we are now giving serious consideration to a World Wildlife Fund (WWF) proposal for a debt-for-nature swap in Madagascar. The WWF has proposed a $1 million dollar grant with $750,000 to be used in a swap and $250,000 to pay for administrative costs. We look forward to identifying more proposals that justify A.I.D. support.

V. CONCLUSION

Mr. Chairman, the phenomenon of excessive, growth restricting debt is clearly a serious problem for many developing nations. In recognition of the severity of this problem, the U.S. Government has been working with other nations, multilateral instituions, the commercial banks and the debt burdened countries to explore potential solutions. Our quest will continue. But I think that we must be carefull not to prescribe one "all purpose" panacea for debt relief. Each debt distressed country is unique -- formulas which work for one country can be totally inappropriate in a neighboring country. We must approach this situation on a case-by-case basis, and attend to the pressures created by debt within the context of each country's own social, economic and political circumstances. The constant, however, is our continuing emphasis on growth-oriented economic policies, which will allow countries to service their debt and generate the resources necessary to reduce the need for additional borrowing.

Representative SCHEUER. Thank you very much, Mr. Bissell.

I guess I forgot to mention that you are Assistant Administrator for Program and Policy Coordination at the Agency for International Development. And the author of a number of books on the subject, and a professor at Johns Hopkins, Georgetown University, and the University of Pennsylvania. I am sorry, I omitted those.

All right, Mr. William B. Dale currently serves as a member of the board of directors of the Marine Midland Bank, and is an independent consultant on various international financial issues. Mr. Dale advises his clients on such issues as external debt workouts, related arrangements for balance-of-payments financing, country risk analysis, international banking and investment, and arrangements for financing projects on an international basis.

His prior work included 21 years at the International Monetary Fund, the IMF, both as U.S. Executive Director and then as Deputy Managing Director for the Fund. And he has written extensively on balance-of-payments problems, international investment, development problems, in numerous public reports and in individual monographs.

We are delighted to have you here, Mr. Dale, and I know we are going to have some questions for you. So why don't you take your 10 minutes, and then we will have some give-and-take.

STATEMENT OF WILLIAM B. DALE, MEMBER, BOARD OF DIRECTORS, MARINE MIDLAND BANK; AND FORMER DEPUTY MANAGING DIRECTOR, INTERNATIONAL MONETARY FUND

Mr. DALE. Thank you very much, Congressman Scheuer.

Given the hour, I will try to be quite brief, in part because, although I welcome being here, and you are very kind to your witnesses, I am a little puzzled as to why I am here. I regard myself as by far the least qualified of the four witnesses you have in front of you.

Representative SCHEUER. Well, I am not sure what you are the least qualified on, but you are certainly the most qualified on advising us as to the kind of reaction that we can expect from the international banking community on these proposals, various proposals of debt for nature and rearranging Third World debt to enhance productivity in the Third World.

I am sure you are more knowledgeable than anybody at the table on the kinds of debt-for-nature swaps, debt-for-equity swaps. Perhaps you can tell us more acutely and sensitively than anybody at the witness table can about this elusive synergy that we are trying to create between the banking community and the development community.

So we are looking forward very much to your testimony.

Mr. DALE. Thank you very much. I will try. I am least qualified on the environment.

As you mentioned, I did spend a number of years at the IMF. Indeed, my career goes back to the Marshall plan, when Mr. Bissell's uncle was in the position that he now has at AID and was the brains of the Marshall plan.

Anyway, in my prepared statement, I have given an example or two of some of the kinds of debt-for-debt or debt-for-equity swaps

that banks have engaged in, either to get out of debt exposure in developing countries, or to convert it into something that may have positive effects both on the country and on the banks' balance sheet. These are examples from Marine Midland Bank. They illustrate in a way how small the world is, in terms of what can sometimes be arranged in quite strange and wonderful ways.

In any event, I can perhaps give a little bit of information on that score, although my knowledge from the perspective of the Marine Midland Bank is obviously limited. It is a significant creditor. It has total exposure of about between a $1,600 billion and $1,700 billion, which makes it a significant second-echelon player among U.S. banks in relation to Third World debt. It is nowhere near the league of Citibank or Bank of America or Manufacturers Hanover or Morgan, or banks of that sort.

Then, in addition to that, I have ventured, perhaps unwisely, one or two comments about the overall subject of debt and the environment. And as I looked into some materials in making preparation for this hearing, I was struck, as I often am as an economist who maybe has a little more time—now that I'm mainly retired, really, instead of being mainly a consultant—as I think about some economic problems.

What strikes me nowadays, now that everything is unsettled in the economics profession, is how little we really know in the final analysis about what makes problems the way they are.

For example, it may seem evident that the debt problem is an important contributor to the low growth of the heavily indebted and debt troubled countries; and I do not deny that that is true. Indeed, that is quite clear. I point out in my prepared statement, much as John Sewell did, that aggregate growth for example in the 15 heavily indebted countries that were the targets of the so-called Baker initiative, fell from around 5 percent in the 1970's to around between 1.5 and 2 percentage points in the 1980's, since 1982 when the debt crisis broke.

When you put those kinds of figures on a per capita basis, obviously you drop from a rather low increase in per capita incomes, in the neighborhood of, say, 1.5 or 2 percent, in the 1970's—significant, and contributing very much to welfare, but not fantastic—down to a negative figure for the 1980's, since the debt problem broke.

Alongside that, you see figures of capital formation which, in the decade of the 1970's, were of the order of 24 or 25 percent of gross domestic product, falling down to around 16.5 or 17 percent of gross domestic product in the years of the 1980's since the debt crisis broke.

And you say to yourself, "Aha, obvious." Capital formation has fallen by a very large percentage of gross domestic product, and the amount of net external transfers related to the debt—that is, interest and debt reimbursement—is of an order of magnitude not far different from the fall in capital formation. That would seem to be at first inspection what it is all about.

It is interesting, however, that the IMF in its most recent world economic outlook, which comes out every 6 months or, in its full edition, every year—the most recent one was published in April—

has done a plausible set of numbers, which has tried to see what there is in this thesis.

It turns out that, on plausible—how should I describe this exercise?—it is a model, it is a model sort of approach to the problem. But using plausible parameters for capital formation and the amount of growth normally to be attributed to capital formation and to existing stocks of capital, they conclude on a very preliminary basis that only at most about a third of the fall in growth in the heavily indebted countries can in fact be attributed to the resource shortage that is attributable to the debt problem.

Now, that does not mean, and I am not testifying, that the fall in growth is not attributable to the debt problem. All it says is that it is not quite as simple as we at first thought.

Seemingly, the problem relates to prolonged and relatively severe underutilization of capital stocks in developing countries, which in turn probably is related to the debt problem.

But I tell this simply to illustrate that some of these casual factors were not perhaps as simple and straightforward as one might ordinarily think. And obviously, when you come to public policy remedies, for the problems that are involved, you have to get the causes right if you are going to get the remedies right.

It may well be that the study that I refer to, which clearly needs to be completed and extended, is part of the intellectual basis for the new debt proposals put forward by Secretary Brady in March; that is to say, it may be more important to get the so-called "debt overhang numbers" down than it is necessarily to get the transfer of capital from the industrial—from the rest of the world, more generally, to the indebted countries.

There, I think, I will stop on what I have to say in my prepared statement, Congressman Scheuer. Just one or two brief words about the question that you raised just before the recess, insofar as I can address myself to it. I will make two or three points.

One is obvious. It is a little difficult, I would say, to spend half of your time bashing the Japanese about trade policy, and the other half of your time trying to inveigle them into doing what you believe to be right and they are not so sure may be right, as far as spending their money is concerned. So obviously, I do not have to convince you, I do not think, that there is a certain problem of compatibility there.

What might be of interest would be to go back and look at what I think is one of the most outstanding examples of collaboration between two countries that I am aware of in the whole postwar period, and that was the collaboration between the United States and Japan in the late 1960's, early 1970's, in the period following the revolution in Indonesia and in the early years of the present government in Indonesia, when that country was being put on its feet after a very, very severe economic crisis in the late 1960's following the revolution.

The principal players on the U.S. side who orchestrated the very successful collaboration with the Japanese Government are retired, but still alive and very much in possession of their faculties, and available for consultation. I know who they are, I would be glad to identify them.

I do not happen to remember the name of the man who was the main person, but I could certainly supply it to Mr. Bissell or anybody else who might want to have it.

The last point I would make is one that I have over the years for many years made to people in the U.S. Treasury and elsewhere, and it goes roughly this way.

It is well known that one thing the Japanese have had in mind for many, many years is to volunteer to put more money into the IMF and the World Bank, but they would like more voting power.

Representative SCHEUER. They would like more what?

Mr. DALE. Voting power.

Representative SCHEUER. Right.

Mr. DALE. The traditional longstanding policy of the United States, going back to—well, as far back as one goes, back to the very beginning of the Fund, in fact, but certainly going back to the beginning of my association in 1962 with the Fund and the Bank—has been that it is politically impossible for the United States ever to contemplate losing its veto in those organizations.

I think that is shortsighted policy. In my view—and this is a view I have held for many, many years—if the United States cannot get any other country with a voting constituency in these organizations to agree, then I think the United States ought to look again at its own policy.

Furthermore, I know of no case, not a single one, in which the United States in a major policy battle has in fact exercised its veto alone. Now, I may stand—perhaps somebody can correct me on that. But it is politically very difficult to veto.

Representative SCHEUER. Well, it is not so difficult, if you are primus inter pares and you are No. 1——

Mr. DALE. But if you are pares inter primus, that is a different matter.

Representative SCHEUER. Yes. If you are no longer first string, and you are second string and heading toward third string, and in desperate financial problems yourself, then the business of the veto becomes almost an irrelevance. It is not a serious matter.

Mr. DALE. I am done, Congressman Scheuer.

Representative SCHEUER. You are finished. All right. Well, that was extremely helpful.

[The prepared statement of Mr. Dale follows:]

PREPARED STATEMENT OF WILLIAM B. DALE

My name is William B. Dale. I live in Bethesda, Maryland, and serve as a consultant in the field of international finance. Perhaps of greater interest is that I spent some twenty one and a half years at the International Monetary Fund, of which 11 1/2 were as United States Executive Director and a further 10 Years as Deputy Managing Director - the second ranking official of the Fund. I was there from 1962 until the end of May 1984, and for a number of manths toward the end of my service at the Fund, I played a quite active role in the attempt to deal with the LDC debt crisis that had erupted in August 1982. It fell to me to serve often as the principal point of contact between the Fund and the advisory committees of banks that had been formed as the vehicle by which the banks conducted their negotiations with those countries that had encountered debt servicing difficulties in the more difficult economic environment that had emerged after the main industrial countries concluded that it was critical for them to deal effectively with the problem of inflation.

As shown in the press release announcing these hearings, I am also a member of the Board of Directors of Marine Midland Bank. Of course, I speak here in an individual capacity, and not for either the bank or its board of directors.

I will first answer to the best of my ability the questions you posed to me, Mr. Chairman, in your letter of June 1, 1989, inviting me to testify; then I will venture a few observations on the general topics covered in your announcement of the hearings.

What is the role of commercial banks in Third World debt relief? How can new bank strategies be geared towards development?...sustainable development in the Third World? Can new loans be made available to Third World countries?...Under what conditions?

The role of commercial banks in the restructuring of the debt of Third World countries has necessarily been very

large, for the obvious reason that the banks held a sizeable proportion of the debt of these countries when the debt crisis emerged in 1982. Thus, for the 73 countries classified by the IMF as having had debt servicing difficulties in recent years, commercial banks held some 47.4% of their external debt of $537.9 billion at the end of 1982; for the 15 countries that were the subject of Secretary Baker's debt initiative in Seoul in 1985, commercial banks accounteds for almost 53% of their external debt of $381.4 billion ate the end of 1982; and even for the countries of Sub-Saharan Africa where one would hardly expect to see much commercial bank involvement other than by trade finance, commercial banks held no less than 28.5 % of the 1982 debt. In the intervening years, the commercial banks have rescheduled and otherwise restructured the debt of these countries in a very thorough-going way - often on multiple occasions. Data of the Institute of International Finance indicate that the total of commercial bank restructurings for the 6 years ending with 1988 was no less than $426 billion for the 15 countries of the Baker Initiative and an additional $144 billion for other countries having debt servicing difficulties. Somewhat similar (but not comparable) figures put together by the IMF for restructurings of official bilateral debt total almost $37 billion over the 6 year period for the Baker countries, along with an additional $48 billion for other countries with debt servicing difficulties. Both of these sets of data involve a substantial amount of multiple-counting, since the debts of quite a number of countries have had to be renegotiated more than once (and are counted in the data each time), and the bank figures involve more multiple counting than those for official debt. Still, the numbers leave no doubt that the amounts that have been restructured are extremely large by any standard, and that the amounts renegotiated by the banks have been huge.

As you are aware, a number of other forms of debt relief have evolved over the recent years, as the so-called "menu of options" incorporated in successive debt renegotiation packages have been broadened and as banks and other financial engineers have exercised their creative genius to see how the interests and requirements of the parties at interest can be brought together into a winning package. The result has been that a fascinating variety of deals, featuring debt-for-debt swaps, debt-for-equity swaps, debt-for-nature swaps and all kinds of other ingenious constructions aiming at getting out of the straitjacket of debt problems, have come into operation. Others can obviously better inform us about debt-for-nature swaps. I might mention just two operations in which Marine Midland Bank has been involved to illustrate some features of some of these exercises.

In one case, a slice of debt in, as I recall, Brazil was swapped in an operation that after a somewhat complicated round of transactions resulted in the bank owning a piece of property in the vicinity of Atlanta, Georgia. Although the bank does not operate there, it happened that through a previous national real estate lending transaction to a business at an adjacent location, the bank's real estate lending people were familiar with the commercial possibilities of the particular piece of property. In another case, the bank engaged in a swap that resulted in a minority position in a local investment enterprise. Although there was, as is always the case in such instances as far as I know, a significant discount on the debt swapped for the investment, in the intervening period of time the total value of the investment has more than recovered the original value of the debt, since the local currency price of the shares has appreciated by more than the depreciation of the currency against the dollar. With such an approach, and given a set of policies in the country that are adequately conducive to growth, I am convinced that pro-growth activities can be found by the parties if there is a sufficient will to do so and if the countries follow policies that are fair, predictable, and sound. To be sure, such opportunities are hard to find and often are not very large in relation to the size of the debt, but they all make a difference and can cumulate up to quite a stimulus to growth and a relief from debt over a period of time. I should add that my impression from observing a number of debt operations now is that in a great majority of cases the effective discount from book value in such instances of fully and carefully negotiated deals is very much less than the discount in the so-called secondary market for LDC debt, which is well known to be not only large, but also growing over the months and years.

Another aspect of bank activity in attempting to get clear of the worst aspects of the debt crisis is the by-now more and more regular practice of working closely with the World Bank, the International Monetary Fund and the regional development banks. A number of points could be made in this connection, including many relating to the direct experience of the banks and the countries with debt renegotiation. Perhaps of more direct relevence to the present situation and hearings would be to mention the quite active role of the IFC in the identification and preparation of debt swap deals, as well as in activities aimed at development of capital markets in general and equity markets in particular. Such participation by the World Bank family in the amelioration of the debt problem are likely to have two particular advantages that can be expected to comtribute substantully to the

objective of sustainable development from an environmental point of view: first, through contributing to overall efficiency of economic life by focusing on correctly identified competitive projects, and secondly by influencing the host country in a favorable direction as far as environmental factors and policies are concerned, both as regards the particular project and more generally.

Can new loans be made available to Third World countries? Under what conditions? I assume that what is being referred to is loans from commercial banks. On that assumption, my short answer is in the negative. Banks have had a pretty traumatic experience in the last six years in regard to lending to LDCs, and although banks are supposed according to rumor to have short memories, I doubt that they are that short. Indeed, the shoe may in some respects be on the other foot. What worries me most at present is that banks are not only avoiding new term lending to LDCs, but that many banks seem to be avoiding even trade finance in relation to those countries, despite the fact that trade finance has with only a very few exceptions been risk-free all during this extraordinary period of debt difficulty. I fear that over-reaction in the direction of caution will harm both the banks and the countries.

But, trade finance aside, I see little hope for much restoration of a sizable flow of money from commercial banks to LDCs at any time in the near future. It seems quite unlikely that such lending will be the best route toward the top of the execudtive ladder in banks any time soon. Moreover, the capability of banks to analyse the cost and benefits of particular business activities has grown very greatly in recent years, and today is far ahead of where it stood in 1982, when the LDC debt crisis started. The plain fact of the matter is that when adequate account is taken of the cost of proper provision of reserves for losses and of loan write-offs, the business of lending to LDCs either is not sufficiently profitable to compete for a very large proportion of bank resources, or the interest rates charged for such loans would have to be boosted appreciably.

Now for a few observations on the relationship between the debt problem and economic growth, sustainable growth from an environmental point of view, and the extent if any to which the debt problem has contributed to unwanted exploiotation of the environment.

For the 15 Baker Initiative countries, growth fell from 5.0 percent in the decade of the '70s to an average of 1.8 percent for the six years 1983-88, and gross capital

formation fell for the same periods from 24.2 percent of GDP to 16.9 percent. Thus, per capita real GDP fell from around 3 percent to almost a negative one-half percent for this group of countries. Clearly, the initial reaction to such figures is to attribute the fall in growth to the reduction in capital formation that took place lin these years, and to associate both of them to the shortage of financial resources that existed due to the net transfer of funds to the creditors over the same period of time. But as in so many cases in economics these days, a closer look indicates that we know rather less than one might suppose about the exact causal connections involved. In its most recent World Economic Outlook publication, the IMF has done a plausible model of the effect of the shortage of investment resources on the growth of these countries, and has concluded from this preliminary examination that not modre than one third of the fall in the growth rate can be accountted for by this factor. The rest seems to be due to a variety of influences that may well in some way be linked indirectly to the existence of the high debt overhang via incentive effects on both investment and other economic activity that result in a persistent and relatively substantial underutilization of capital.

As far as more direct discussion of environmental aspects is concerned, I confess that I am well out of my professional area of expertise. On the face of matters, I don't readily see why in principal the existence of the debt crisis should necessarily lead to policies and practices that would be adverse in their effects on the environment. For example, the exports of countries with debt servicing problems in recent years have expanded considerably less rapidly, not more rapidly, than those of countries which have not encountered debt servicing difficulties - that is part of the reason why the countries that have had debt problems have had them. So I don't believe that the sheer rate of growth of exports can necessarily be charged for any unwarranted disregard of environmental factors. Indeed, unfortunately all too much of the necessary improvement in the trade and current account positions of the troubled debtors has in fact come about from a compression of imports rather than from a growth in exports.

But perhaps I am not as well informed as I should be on these matters, and I look forward to learning from the hearings as well as to contributing to them. Thank you.

Repesentative SCHEUER. Let's start the questions with you, Mr. Dale. I am having a great deal of difficulty understanding why the banking community around the world is not eager to enter into some kind of systematic debt-for-equity, debt-for-environment, whatever, swap.

Because if they looked at the matter realistically, they would understand that the world financial community values this debt at 50 cents on the dollar, 40 cents on the dollar, and that is how they have to look at it. Their debt—you are shaking your head.

Mr. DALE. I am shaking my head "no." Because——

Representative SCHEUER. I mean, to me it is almost preposterously unrealistic that there is the slightest likelihood that they are going to get repaid this debt 100 cents on the dollar, when in a succession of egregious bad judgments they made these pitifully wrong-headed loans. And some of the circumstances in the future militated to make them even worse than they thought they were going to be, the market for oil plummeting and a few other things.

Now, why today are they not ready to face up to the fact that these were bad loans, they are worth 50 or 40 or 30 cents on the dollar? And why don't we sort of gather ourselves together and figure how we can climb out of this big black hole that we have dug ourselves into, working with the developing countries, working with the financial community, to work out ways of making some new loans economically viable, sustainable; perhaps reducing the amount of the loans, perhaps making the existing loans junior, deferring amortization payments, reducing the interest payments, making it economically possible for the banking community to get into the picture, get into that ball field, and make some new loans that would sustain urgently needed economic development.

Mr. DALE. Let me go back. You said that they were obviously bad loans to begin with. Well, not so obviously at the time. I was a public official during the 1970's, when many of these loans, most of these loans, were made. I can recall—and this is not the proudest part of my career, you understand [laughter] but I can recall when I and others, people in the then-administration and people up on the Hill, were saying, because it was then the conventional wisdom starting about in early 1975 I would say, not very long after the first very severe increase in the oil price that took place about the end of 1973—we were all desperately worried about the possibility that a seizing up of the international financial mechanism was going to take place, and that banks would not lend.

So we were busy telling banks that it was their public duty to lend to developing countries all over the place. And they did, somewhat to our surprise, to be honest about it. John Sewell remembers that, I am sure.

And again, all during the 1970's, it kind of tootled along all right——

Representative SCHEUER. As long as they had these spectacularly high oil prices——

Mr. DALE. Right.

Representative SCHEUER [continuing]. Sustaining development in the oil-producing countries.

Mr. DALE. In the oil-producing countries, but in a lot of other countries as well. Yes, of course, Mexico, Nigeria, Indonesia, a lot

of other oil-producing countries. But the loans went to Brazil and Argentina and Peru and Ecuador and all kinds of other countries, some of which were and some of which were not oil producers.

Again, when the second major oil price increase took place in 1979–80, again we were desperately worried that the world was on the brink of disaster in the shape of a major recession all over the world, and we told banks that it was their public duty to lend.

Mind you, I was not a banker. I am not trying to apologize. I am not a banker now—you have me listed as a banker, but I am not really. [Laughter.] We told them that that was their bounden public duty. And I can remember talking to bankers at the time, "You really ought to do a lot of this lending." Now, I do not flatter myself or you people up here on the Hill that bankers lent because I told them and I was a public official and all that sort of thing. But they obviously did not think they were bad loans at the time.

And with the benefit of hindsight, we can all say they were bad loans. They and the countries concerned made terrible mistakes, and they had bad advice as far as lending for nonproject purposes, and/or that the projects they lent to were badly designed projects. And they implicitly or explicitly thought that interest rates were going to be negative in real terms from now until doomsday, and all that sort of thing.

And then Paul Volcker came along and did what had to be done. He took the policy actions that resulted in interest rates almost going through the ceiling. And directly or indirectly, that brought on the debt crisis.

Once the debt crisis emerged, banks all of a sudden not only lost their nerve about lending at the prodigious rate they had been lending up until that time, but they lost their nerve and did not do any lending practically at all.

Now, you are right: In a perfectly rational world, banks internationally, as they do under the bankruptcy arrangements domestically, would sit down and work out a scheme with each debtor, under which the debtor had a reasonable chance of being made whole and would, to the extent necessary, cut the interest rate, and would take a bath to a certain extent on their loans, and so on and so on.

As Ms. Bramble pointed out, there is not such an arrangement internationally. But more than that, these are such huge amounts in relation to the elements of the world banking system, and in relation to particular banks, that it is not just like *x-y-z* company going bankrupt.

Anyway, the reason that I shook my head so vigorously at your question, Congressman, is that, although the market says that the loans are worth very low percentages of their face value—there is no doubt about that; you can trace it, and it is down around on the average perhaps 20 or 25 percent of the face amount—nonetheless—and here I can use my experience at Marine Midland Bank—every single debt-for-equity swap that Marine Midland has made, and I am sure that is true for all the other banks, has been at an exchange value that is well above the market rate.

I cannot recall a single one that has been less than about 65 or 70 percent of the face value. And I point out in my prepared statement that I cannot name names or countries, because there are

some confidential things about it. But there is one case that I have in mind where Marine Midland and other banks, along I think with the International Finance Corporation, a year or so ago invested through a debt-equity swap in a local financing company in one of these countries.

It took about a 30-percent discount on the debt that it put into that operation, but it has appreciated and today it is worth more, it is about 20 percent more or so than the original face value of the debt.

So if you are careful and do your job well, you can actually make money in this game. But I have to point out, of course, that the amounts you can do thus far—it is very hard work, and the amounts you can do are small.

Mr. BISSELL. Congressman.

Representative SCHEUER. Yes, Mr. Bissell.

Mr. BISSELL. Could I add—I think there is also an assumption in your question that most U.S. banks that hold loans in the developing countries want to remain in business there.

That is a major problem that we face. As I check around specific developing country situations, the overwhelming majority, indeed, nearly all U.S. banks, do not plan to be in business in developing countries in the future. That is, they plan no new lending.

If they had a convenient way of eliminating their presence, their involvement in developing country finance, they would.

What this has meant is that there is available to the secondary market a growing percentage of LDC debt held by U.S. banks. A recent estimate was that 5 years ago perhaps 1 percent was available to the secondary market. Today, 20 to 25 percent of developing country debt held by U.S. banks is in effect on the block.

But in a sense that is a sad message.

Representative SCHEUER. In a sense it is what?

Mr. BISSELL. It is a sad message, because U.S. banks do not plan to participate in the next growth cycle in developing countries if they can avoid it. That is the lesson that they have learned out of this last decade.

Representative SCHEUER. Well, it is one lesson that you could learn. That whole history of 15 to 20 years is sort of like the movie "Rashomon." It is like the seven blind men describing the elephant: one from the vantage point of holding onto the tail, one holding onto the trunk, another holding onto the tusk, another holding onto the hoof.

You can get a lot of lessons over the last 20 years. And one lesson is that, if you make sound and prudent loans that are economically sustainable and environmentally sustainable and that do reflect the realities of development, they are likely to be good loans.

How do you react to that statement, Mr. Dale?

Mr. DALE. Oh, I think that is right, Congressman.

As a matter of fact, I say in my prepared statement, and I feel very strongly, that the pendulum has swung way over to what I think is the wrong side, as far as banks are concerned. A lot of what we now call superregional banks in this country got into term lending to developing countries at a late stage. They got in not

being very expert. They kind of got onto the tail of other bigger banks.

Many of them—most of them I guess have pretty well gotten out now, and regard their experience as bad and——

Representative SCHEUER. They have been burned.

Mr. DALE. They have been burned. And if you want to get up the corporate ladder in those banks and in many other banks, you stay away from sovereign lending. That is the lesson they have learned.

And it has gone further, and this is what I think is just terrible. It has come to the point where I think an unusually large number of second-level or even large regional banks and smaller banks will not do trade financing with developing countries.

Now, that is just sheer nonsense.

Representative SCHEUER. And it is dangerous nonsense.

Mr. DALE. Because practically no trade financing has been the subject of renegotiation. It is bad for us. It is bad for us, and it is bad for the countries. But that is the way many banks are operating.

Representative SCHEUER. I mean, that threatens the whole international banking system, and it also threatens development all over the lot in the Third World.

Mr. DALE. That is right.

Representative SCHEUER. We want private banking participation in Third World development. And if you had asked a banker 25 years ago, he would say:

> Boy, there is a real role for us in there to make sure that these loans are sound, are prudent. And we don't need fuzzy-minded, pointy-headed bureaucrats in there showing us how to make loans. We are the guys with the practical business experience and the hands-on know-how to make loans that are viable and that will not be a bloody disappointment to everybody.

I am not sure they were right then, but I think they do have a role today.

Mr. DALE. They are wrong now.

Representative SCHEUER. Yes.

Well, John Sewell, in Monday's hearing, Bob Repetto proposed to include natural resources in the national income accounts. Do you think—and maybe I will ask you this question, too, Ms. Bramble, or any of the four of you—could this eliminate market distortions to make these adjustment programs suitable for sustainable development?

Mr. SEWELL. I think I am not an expert on national income accounting, Congressman. I have read Bob Repetto's work, and it is very impressive. I think it is an extraordinarily useful first step in redoing our concept of development and growth, and should be pushed as rapidly as possible in order to give us the kind of measures that we need when we plan future activities.

I really think there are two needs now. One is to have a much better picture than we have of what is happening in terms of development progress in the Third World. We, of course, have GNP figures, collected according to standard statistical definition.

A number of people played around in the 1970's with the various ways of measuring human well-being. My organization, when Jim Grant was head of it, adjusted a physical quality of life index.

Representative SCHEUER. PQLI.

Mr. SEWELL. PQLI, which measured infant mortality, life expectancy, and literacy. The real problem, of course, is that you do not have up-to-date figures on any of those for most Third World countries. There is the data collection aspect to it which is the counterpart of Bob Repetto's attempt to redefine GNP.

I think the development of uniform, accepted measurement standard is absolutely urgent. Because as you look at any activities in the future, you have to have a measure which reflects the real cost; that is, an environmental cost as well as an economic cost. We urgently need that. I would encourage that greatly.

Representative SCHEUER. And the real value to a country——

Mr. SEWELL. Yes.

Representative SCHEUER [continuing]. Of distributive programs.

Mr. SEWELL. I think they have made a real contribution in this area.

Representative SCHEUER. I remember how impressed I was at the time when he showed that per capita GNP in oil-rich developing countries like the Philippines, Venezuela, Nigeria, and a few others, were on the order of magnitude of $5,000 or $6,000 per capita. He also showed that in a much poorer country, like let us say—I am trying to think of the little island off the foot of India.

Mr. BISSELL. Sri Lanka.

Representative SCHEUER. Sri Lanka. In a country like Sri Lanka, that may have had a per capita GNP of $250 or $300, as compared to the $5,000 for these other countries, that on the PQLI scale, on the perceived quality of life scale, Sri Lanka was way above these others.

What in effect he was teaching us—and I do not know if he ever put it into words—was that in these countries that have a pyramid with a very small number of people on the top enjoying all these resources, and a vast number of people living in great poverty at the base, that the per capita GNP derived by taking the total GNP and dividing it by the population is an absolute fraud. It is a living lie. And the world is not like that in those countries.

In those countries, a few people live in enormous luxury and most everybody else lives in abject poverty with little or no middle class, and the school system is pitiful, the family planning programs do not exist, maternal and child health programs do not exist, health service, educational services, and housing services are minimal.

In a country like Sri Lanka, that has a terrific array of redistributive programs, where exactly the same percentage of little girls go to school as little boys, where there are pervasive systems of family planning, and where their population growth is very small and quite well under control so that they have some resources left over for education and health service and so forth—the actual data on infant mortality and life expectancy at birth and other statistically verifiable data indicate a substantially higher perceived quality of life in that little country with a per capita GNP of perhaps $250 or $300, than these other countries where they take the gross national income and divide it by population and come up with this purely mythical figure of $5,000 or so.

That was a great lesson for me.

Mr. SEWELL. You underline the real need for better data collection. Now, this is the usual academic's refuge: "Well, we will do a study." And I do not mean that.

Because in many areas, we just do not know what is happening, when the techniques to find out, at least in some overall sense, about what is happening are quite possible. You made note, or your staff notes that UNICEF is beginning a series of samples around the world, which will give them quite up-to-date figures on things like infant mortality, health care, and so on.

Similarly, there are technical problems. But the possibility of using satellites to measure rates of deforestation is quite within the realm of the doable, if someone is willing to pay for it.

So we have a whole set of techniques that we are not utilizing, to find out both where we are, and where we are going.

Representative SCHEUER. Yes, Ms. Bramble.

Ms. BRAMBLE. I am certainly not an expert on national income accounting, either. But I have not only read Bob Repetto's work, but talked to him about it. And the thing that we are hoping for, beyond what he is suggesting at the moment and its current application in terms of the revision of the account system, is a way that that information can inform structural adjustment recommendations in the future.

Moreover, another part of the campaign that we have been working on for 5 or 6 years on reforming the multilateral development banks and their project lending is broadening it to include the International Monetary Fund and really trying to talk with them about how they know what they are doing—I mean in a longer than 6-month, 18-month, 24-month timeframe—and the coming together of the IMF and the World Bank in this now almost blurred role of structural adjustment planning.

At the moment, there is an assumption that a certain set of prescriptions will have a particular desired effect, and yet, we have no real knowledge about whether it will and what that leads to 5 years and 10 years down the road. The kinds of resources that Bob Repetto is looking at need to be in those prescriptions, and at the moment there is not the capability of making that analysis.

So it really is part of the same thing. It is a much broader question than simply the accounts.

Representative SCHEUER. Well, where do you think we ought to be producing the data that would enable us to find tune our lending policies to include concepts of sustainability, to include concepts of environmental degradation, to include concepts like Jim Grant's concept of the perceived quality of life?

Ms. BRAMBLE. Those are local questions, and there are going to have to be institutions at a local level gathering the data. A number of Latin American countries actually have institutions——

Representative SCHEUER. One institution?

Ms. BRAMBLE. Each country probably will have to have several, depending on how big it is, ranged around the countryside. But Mexico and Brazil have had excellent institutions gathering these kinds of statistics. They are essentially giants compared to most of the countries we want to know about.

Representative SCHEUER. Yes.

Ms. BRAMBLE. But there is the capability of replicating those institutions through sort of self-training and institution building. There are plenty of trained people in Mexico who know how to gather statistics with ranges of students and umpteen kinds of programs. They are mostly out of a job right now. So they are very available to enter into cross-country training programs, cross-Central America, cross-Africa, cross-Asia, lots of things.

Representative SCHEUER. Wouldn't you have to have, at least on a regional basis, and probably on a global basis, some institution at least going through the discipline of deciding what questions are going to be asked——

Ms. BRAMBLE. And the gathering all together.

Representative SCHEUER. And the gathering all together.

Ms. BRAMBLE. Yes.

Representative SCHEUER. So that these young people in each of these countries and the teaching cadres and so forth would have some standard operating procedures to look through, and standard measures, and so forth.

Ms. BRAMBLE. That is true. There is no dearth of institutions that can fill that role. What is missing——

Representative SCHEUER. Who ought to fill that role? In designing it for global application.

Mr. SEWELL. Well, in my view is that the international institutions have a major role to play.

Ms. BRAMBLE. U.N. related ones.

Mr. SEWELL. If I can speak for my academic colleagues, they have a very difficult time coming to agreement on those kinds of measures. And in those cases, there has to be a forced definition of both what is collectible and what is useful.

Representative SCHEUER. You cannot be comparing apples with oranges, and peaches with——

Mr. SEWELL. But there are two needs. One, and the most urgent need, is, as Barbara Bramble said, building on-the-ground capacity in countries to collect that data under agreed upon criteria.

The Indians, for instance, have a marvelous statistical capability. They can tell you what happened back in the 19th century, in terms of human well-being across the Indian states. Other countries cannot, particularly in Africa.

So it is a two-pronged effort. And we all depend very heavily on the data from the International Monetary Fund and the World Bank on financial issues. There is no reason that the World Bank cannot produce that same kind of data on social issues with sufficient resources.

Representative SCHEUER. Well, as a matter of fact, the World Bank is moving into at least an accounting system that does measure environmental degradation. I suppose that with a little prodding they would include some social accounting, too.

I am going to ask unanimous consent to include in the record an address by Barber Conable that he made the night before last before the World Resources Institute here in Washington, in which he made clear his determination to expand the concept of income accounts, in which he made clear the urgent necessity of engaging in rational population programs to restrain the population explosion which is so crippling economic development, and in which he

made clear the dedication of the World Bank to sustainable development in exactly the framework in which we are looking at it now.

[The address follows:]

ENVIRONMENT, POPULATION AN. SUSTAINABLE DEVELOPMENT

Address

As Prepared for Delivery

by

Barber B. Conable

President

The World Bank

to the

World Resources Institute

Washington, D.C.

June 13, 1989

Thank you, John.

Distinguished guests.

Ladies and gentlemen.

Meeting with this group, on Capitol Hill, is like coming home. I hold many fond memories of the years I spent in Congress and the friendships formed. I feel a special kinship and have a great deal of respect for the World Resources Institute, also, which has a close working relationship with the World Bank.

Just over two years ago, I had the pleasure of speaking to members and supporters of the World Resources Institute about the environmental action agenda of the World Bank. I am pleased to be with you tonight to talk about the progress we've made and the important next steps.

When I took over the Presidency of the World Bank, I started with the premise that the Bank ought to be devoting more staff resources and more financing to help borrowing countries safeguard and improve the environment. My aim was not to turn the World Bank into an environmental agency--for its goal has always been, and will continue to be, development and the reduction of poverty. But I did intend for the Bank to integrate environmental concerns into its day-to-day activities and to put the environment on the front burner in our policy dialogue with Third World countries.

Most of you know the facts and recent developments. The World Bank has:

- created a central Environmental Department as well as Regional environmental units;

- increased staff resources assigned full-time to the environment sevenfold over staffing three years ago (about 65 staff years);

- prepared Environmental Issues Papers for most of its active Borrowers (more than 70 countries will be covered by August);

- set up a $5 million Environmental Technical Assistance Program to speed up preparation of environmental projects.

- initiated a number of regional studies, including a capital cities cleanup project for the Asia region, supported by the UNDP, and an environmental program for the Mediterranean, funded jointly with the European Investment Bank.

More than 100 projects containing significant environmental components will be approved by our Board during this fiscal year which ends June 30. This represents about 35 percent of the expected total of Bank and IDA projects for FY89. Sixty percent of all agricultural projects expected to be approved this fiscal year contain environmental components. Environmental components have been prominent also in energy and power projects, in transportation projects, in water supply and sewerage, and urban development. Clearly, environmental monitoring is now a critical element of our Operational work.

For the three fiscal years 1987 to 1989, IBRD and IDA lending for forestry projects will total $474 million. We will more than double that in the next three fiscal years. In addition, we expect to lend some $1.3 billion for free-standing environmental projects over the same period.

This overview of the Bank's progress on its environmental action agenda indicates, I hope, my commitment to act on our convictions. But I realize, of course, that we still have a long way to go.

Public Awareness

Let me be frank. The past three years and the Bank's new emphasis have not been easy. Some developing countries resist environmental programs because these are perceived to be foisted on them by industrialized countries. In its most extreme form, the perception is that the advanced countries have found yet another excuse to impede the development of poor countries and to encroach upon national sovereignty in a modern day version of colonialism.

So far, national sovereignty, on the one hand, and collective responsibility of all nations for the planet's health on the other, have not yet reached a clear accommodation with each other. We have not yet arrived at the point where, like peace and security, the restoration and preservation of the health of planetary ecosystems is perceived as a factor of the highest common welfare.

Having sounded that note of caution, let me nonetheless say that I believe that the growing environmental awareness that we are witnessing is a mighty force of the kind that can eventually bring about the needed consensus on the environment.

In a recent Lou Harris poll of environmental attitudes in 14 industrial and developing countries, between 75 and 100 percent of those polled agreed on the need for strong action. Overwhelming majorities wanted stricter laws and indicated they would even be willing to pay higher taxes if such taxes were directed to environmental improvement. And when asked to choose between a higher living standard or a lower living standard with higher environmental quality, between 70 to 90 percent opted for the latter.

The majority also felt that man, not nature, is the cause of environmental degradation.

Industrial Nations' Reponsibilities

Now this raises an awkward question. By man, did the respondants mean Third World man? You would think so, judging by the media focus on Third World issues, such as Brazil's diminishing rain forests.

But this is both inaccurate and short-sighted. Unless and until the industrialized world is prepared to accept and act upon its own environmental shortcomings, it will be difficult to persuade developing nations that there is such a thing as a collective global responsibility for our planet's health.

The reality is that it is the industrialized countries which account for most pollution.

For example:

North America and Western Europe are together responsible for 71 percent of the industrial emission of carbon dioxide into the atmosphere but account for only 8.2 percent of the world's population. The developing world, with 79 percent of the world's population, is responsible for only 7 percent of the industrial emission of carbon dioxide.

Carbon dioxide, as you may know, is the most significant of the gases building up in the atmosphere and accumulating heat from the sun to produce global warming, the so-called Greenhouse Effect.

Take the United States:

- It produces five tons of carbon dioxide for every man, woman and child in the country. The world average is under one ton.

- The United States continues to permit the export of agricultural chemicals banned in this country as dangerous to human health or the environment.

- Fuel consumption is the principal cause of air pollution and global warming. The U.S. continues to lead all industrial nations, except Canada, in the amount of energy used per unit of production of goods and services.

- The United States accounts for nearly a third of all use of chlorofluorocarbons escaping into the atmosphere, the most important of chemicals depleting the ozone layer.

- And Hawaii has the highest number of endangered species for its size of any area in the world.

As Cassius said: "the fault, dear Brutus, is not in our stars but in ourselves."

But don't get me wrong. This country is, of course, not the sole offender among industrial nations, not by a long shot. But it does not make it easy for this nation to preach environmental rectitude to developing nations when those to whom the United States preaches have such solid grounds for telling it to clean up its own act first.

Nor is it easy for the World Bank to pursue its environmental goals when the nations who are its largest shareholders are reluctant to practice what they preach.

It is in this context that I welcome the many environmental initiatives Members of Congress have sponsored and, particularly, President Bush's Clean Air Plan, announced yesterday.

There is no doubt in my mind that we will only succeed in our global responsibility if the developed world leads the way.

The Population-Environment-Poverty Link

I am greatly encouraged by the growing environmental awareness of people and governments. But I am concerned that this awareness of environmental issues has not been matched by a similar concern over population growth rates.

The linkage between poverty, environmental degradation and unchecked population growth is a real one. And it needs to be more widely recognized and more urgently addressed. In short, the global population issue must be put back on the global agenda.

Why?

Here are some basic statistics:

- The world's population took 130 years to grow from 1 to 2 billion; but at present rates will take only 10 years to go from today's 5 billion to the years 2000's 6 billion.

- More than 90 percent of the added billion will be born in the developing world.

What will be the likely impact of this if growth rates remain unchecked?

- population will be too large in relation to the productivity of the resource base;

- larger numbers of people will suffer from poverty, ill-health, and malnutrition;

- increasing population will put added pressure on the environment, causing more degradation of agricultural land, the further destruction of forests, greater shortages of water, and the loss of flora and fauna species; and

- there will be mass migration of "ecological refugees" from areas that can no longer sustain them.

In such developments lie the seeds of political instability and international tensions.

Call it a worst-case scenario if you will. But it is still very much in the cards, unless nations are prepared to check high population growth rates within their borders.

What, then, should be done?

If we are agreed that sustainable development is our objective, then the prerequisite is to bring human populations into balance with the natural resources that support them. As the Population Crisis Committee has warned:

> "We don't know what will happen to the natural resource base at a population of 8, 9, 10, 14 billion."

If not limited by conscious human planning, population growth will surely be limited by natural resource constraints, because populations cannot be sustained beyond the "carrying capacity" of their regions.

There are, therefore, only two viable choices:

- act to lower population growth rates through family planning;

- seek to expand the carrying capacities of the regions in which they live.

Both options are necessary for most developing countries. My concern is that the reduction of population growth rates is receiving insufficient attention. The danger of exclusive reliance on production expansion is clear enough: excessive exploitation of the resource base, a kind of "deficit spending". There are historical precedents for this. For example, evidence is growing that the Mayan civilization in Mexico vanished when population pressures caused deforestation and soil erosion.

The United Nations has suggested that the global population will rise to 8.5 billion by the year 2025 and stabilize at about 10 billion, almost double its present size, a century from now. But this projection assumes a drop in fertility in the developing world by a third in the next 30-40 years. It assumes that a large number of women in developing countries, more than 1.2 billion, will start to use family planning in the next two decades. It is, in short, an optimistic scenario.

If this does not happen, the less optimistic projection of the United Nations shows a population already approaching 10 billion by 2025 and stabilizing at about 14 billion. Africa's population alone would be nearly 2 billion and Asia's nearly 5.5 billion, larger than the population of the whole world today.

The message here is clear. Dr. Nafis Sadik, Executive Director of the UN Fund for Population Activities has urged "action now, not in the next century. By then it will be too late."

The World Bank and IDA have lent over half a billion dollars for population projects over the past five years. We expect to raise this level to some $800 million in the three fiscal years 1990 to 1992.

We will increase our efforts to support the adoption and implementation of national family planning programs. We will include Population in our ongoing policy dialogue with our member countries. But, clearly, the governments must "own" these programs. They cannot be imposed from the outside.

The United States spends more than any other industrialized country on family planning programs overseas: some $230 million this year. But this is down from $290 million in 1985, and the US has not contributed to the UNFPA since then. I urge other countries to carry part of the burden of financing these programs.

Summing Up

The linkages between the environment, population, and sustainable development are obvious. We must recognize our collective responsibility to maintain a healthy ecosystem on this planet.

Towards the end of his life, the aviator, Charles Lindbergh, was asked whether he thought civilization could survive the march of progress. After due reflection, he replied:

"The final answer will be given not by our amassing of knowledge, nor by the discoveries of our science, nor by the speed of our aircraft, but by the effect our activities as a whole have upon the quality of our planet's life - the life of plants and animals as well as that of men."

I'm sure all of you here tonight agree with this sentiment.

Thank you.

Representative SCHEUER. Mr. Conable indicated that it would take 3 to 5 years to work into the process this new concept of income accounting. Would it be a reasonable thing to say that the World Bank could produce these uniform measures, these uniform accounting systems by which all of these countries could test both what was going on and test new loan proposals, new loan applications, for sustainability, for its impact on social systems, and the like?

Would the World Bank be a proper repository to do that?

Mr. SEWELL. My own view is that the World Bank would be a very proper repository for that kind of information on what is happening on the ground, across both economic, social, and environmental areas.

Representative SCHEUER. Ms. Bramble.

Ms. BRAMBLE. It certainly could be. I think that there is a growing institutional not just capability but perhaps understanding of their potential role in stimulating development that would be more rational.

What I sense as the limitation at the moment is a clear mandate from, say, more than just the United States to do so. We have had a situation in which, for umpteen years now, 5 years at least, the United States has been on record as pressing environmental reforms. At first, it was an extremely lonely voice.

Representative SCHEUER. Excuse me. A lonely voice? Yes.

Ms. BRAMBLE. A lonely voice. And the World Bank was, as an institution—well, I mean institutions are made up of people, and people act on the basis of incentives in their own job descriptions.

Once it became clear that the job description includes looking at some very specific environmental impacts, they are quite capable of doing it. A new job description which would include taking this wider view that we are talking about would have to be inculcated from top to bottom inside the institution.

If that can be done—and that means that Europe, the Japanese, and all of the borrowers as well as the lenders have to agree that this is something the institution should be doing—I think the staff does try to take its marching orders from the board of executive directors, and to arm itself in terms of capability with people to do so.

They can do whatever it is that they are asked to do. It is just that we have not been very clear on what it is we want them to do. "We" as a world.

Representative SCHEUER. Let me ask you—and I know you are bursting forth—what do you think of the long-term political acceptability of the whole concept of debt-for-nature swaps, of the whole concept of our saying to these countries, "You have to look at long-term economic sustainability. We want you to preserve your capital assets that produce tourism income." And we would say that to Tanzania and Kenya. "Don't let your black rhinos disappear. Don't let your elephants disappear, as they will by the year 2000 or shortly after. Preserve these assets which underpin your tourism industry, which is your No. 1 source of foreign earnings."

Shouldn't we be saying that same thing to the Brazilians and the Indonesians, and the Costa Ricans, and so forth? We do say it, but they object on grounds of sovereignty. They object on the grounds

that they have apparently a right to destroy these assets to get income over a few pitiful years in the short run.

What kind of political opposition are we likely to see as we press forward on this whole debt-for-nature swap, on the whole principle of assistance on debt restructuring that is hooked to a quid pro quo in terms of a climate for them to increase their environmental behavior, their natural resource behavior, and raise it to more responsible levels?

What kind of problems are we going to bump into as we get from a few isolated examples of success to general programs that we would like them all to adopt, and enhanced standards of environmental behavior and natural resource exploitation behavior, sustainable yield harvesting, sustainable yield development, as we begin to press that on these developing countries broadly? What kind of a reaction are we likely to get?

Ms. BRAMBLE. Well, this will take a couple of minutes to respond to.

Representative SCHEUER. Well, it was a very simple question. [Laughter.]

Ms. BRAMBLE. Yes. Yes, I know. But give me a little latitude here in the answer.

One thing is that what you read in terms of that April 7 article was an extremely specific set of responses to a very specific incident, which was the declaration on April 6 of the Nossa Natureza program of President Sarney, which in his response to all this pressure that we have been dumping on him more or less for several years, but in great quantities since last September.

Representative SCHEUER. You do not think it was typical?

Ms. BRAMBLE. No. Not at all.

And perhaps that Minister of Planning in Rondonia does feel that. Many of the government agencies throughout the states of the Amazon do. But that is because who is voting for them right now is an extremely small minority of people who are recent migrants to the Amazon, and who do not know a lot of things about the Amazon, and who have expectations of a certain kind of development that either was possible in other parts of Brazil, or that they saw in their own first couple of years or few years in the Amazon, or that they heard about from the United States.

So there is a whole lot of mythology that goes into a statement like that, instead of long-term life in an area like Amazonia.

There is a whole lot of new people in that region who were induced to go there by the government programs of the 1970's—which you had quite a bit to do with, in exposing, shall we say, several years ago in hearings that you held. Those new people do not naturally understand the differences of how a tropical ecosystem works or does not work, as opposed to where they came from.

So it is a learning process. And that is going on. It is going on at all levels in Brazil, in government as well as in the strongly pushing nongovernmental sector, the environmental advocates and the universities which are really making quite an impression now.

Another thing that has to be looked at in terms of background is that Mr. Sarney is an outgoing president. He has been in office for almost 5 years. His policies on almost every front have failed miserably, economically and socially, credibility speaking. And he is

desperately seeking a way to evade what he suspects will be history's judgment of his time in office.

This sovereignty spasm that is happening, even though it is very reflective of most countries in the world—I mean, Mr. Sarney often says, how would we feel here if he and his friends came in and started talking about what we do to the Tongas National Forest, and what we seem to be thinking we are about to do——

Representative SCHEUER. In Hawaii.

Ms. BRAMBLE. And they are right. And I have invited them to come and do it, quite frankly. I mean, the Minister of Interior of Brazil has a personal invitation from me to find a platform in this country to say things about the Arctic National Wildlife Refuge.

But there is this longstanding hundreds of years in which the United States has been telling them what to do—usually wrong. And here we come with another set of prescriptions. How are they supposed to know it is suddenly right? That is the first reaction.

Representative SCHEUER. A very understandable reaction.

Ms. BRAMBLE. Yes, exactly.

Second, what is it that we do so wonderfully here with our own resources? As John Sewell was saying, the day that we take acid rain, global warming, and toxic waste production seriously, maybe they will take some things seriously, too. That is part of the global bargain we ought to be talking about.

Representative SCHEUER. And execute some rational national programs that really have some bite, and that cause us to make some identifiable sacrifices.

Our own recycling programs, for example, are way behind most of the world. I mean, it is a disgrace.

Our own treatment of the automobile as a polluting factor——

Ms. BRAMBLE. Exactly.

Representative SCHEUER [continuing]. As a gas guzzler, really shows lack of national character.

Ms. BRAMBLE. Yes. And the newest——

Representative SCHEUER. Time magazine, in January—I have the gavel, remember that at all times. [Laughter.] Time magazine, in their January issue on the environment, "Globe of the Year," which is one of the great contributions I think to raising the level of consciousness of ordinary people all over the world—they ought to get the Congressional Medal of Honor. The new editor of Time magazine, Henry Muller, is an extraordinary human being.

Anyway, they recommended in that January issue on the environment that we have a 50-cent-per-gallon tax on gas.

Ms. BRAMBLE. Very rational.

Representative SCHEUER. Now, Time magazine is not an organization produced by pointy-headed intellectuals. [Laughter.] It is a rather mainstream, centrist publication that appeals to the broad masses of thinking people.

When they can have an issue devoted to the environment, that tells you that the environment has moved to center stage. And when they advocate a 50-cent-per-gallon gasoline tax from this rather centrist, moderate, thoughtful editorial group, that has to tell you that we should be thinking seriously along those lines.

Mr. SEWELL. I hope it will be persuasive in Congress, too.

Representative SCHEUER. Yes. Well, this is exactly the point I presume Barbara Bramble is making. Nobody is talking seriously about a 50-cent-per-gallon gas tax, at least nobody who is not contemplating retirement a year from November. [Laughter.]

Ms. BRAMBLE. Right. But until we are——

Representative SCHEUER. But look at the impact that that would have on our entire situation with Gramm-Rudman. It would be $50 billion a year more income, $50 billion. A penny-per-gallon tax equals $1 billion a year.

Look at the impact that a tax like that would have on fuel efficiency. The Japanese, the Swedes, the French, and I think the British, all have prototype cars, working models, that get 80 to 90 miles per gallon in the city, and 100 miles a gallon on the road. The Japanese have a model that will get 120 miles a gallon on the road.

The reason that the American manufacturers do not engage in this kind of research in a serious way is, they say, "Well, gas is so cheap here——"

Ms. BRAMBLE. It would not pay.

Representative SCHEUER. "It would not pay. Consumers would not spend another thousand dollars on a car if it is going to take them 3 or 4 years to get it back with a tax of 10 cents."

One of the results of gas being taxed at the rate of $2 or $2.50 per gallon, around the world, all over the western industrialized world, is that they perceive of gas as being something scarce and valuable, and they design cars that are reflective of that.

Ms. BRAMBLE. Well, think of what the impact would be in Brazil, though, if we really looked like we took all these issues seriously. And that gas tax would be one of——

Representative SCHEUER. Yes.

Ms. BRAMBLE [continuing]. The most important moves that we could make, that would say, "All right, we are asking you to look at the long-term value of this forest you are the owner and custodian of. We are doing something, too."

Representative SCHEUER. And let me just say—and this is on my time, not yours—Barber Conable, to his eternal credit, made a point very clearly the night before last, that in order for the United States to achieve any credibility in trying to enhance environmental behavior around the world, and raise environmental behavioral standards, and encourage sustainable development practices—before any of that would be real and credible, we had to get our own behavioral house in order, too, here in this country.

We cannot say, you know, "Look at what we say but not what we do," we are going to have to tell them, "Look at what we are doing."

Ms. BRAMBLE. Exactly.

Representative SCHEUER. And then you will respect our credibility, and hopefully you will respect our right to make some suggestions about all of us moving together to enhance global environmental responsibility, and global sustainable economic development everywhere.

Ms. BRAMBLE. Well, let me tell you where things are going, though, even in advance of that, which can end this on a little bit of a positive note.

Despite all of the battles that went on this winter with U.S. Senators visiting and kind of getting into hot water in terms of mischaracterizations of what they were proposing—but anyway a lot of this sovereignty reaction came in response to some suggestions of debt reduction, international and environmental funds kinds of connections. The virulence of the reaction from the Federal Government in Brazil was more related to being very upset at international pressure—blaming them almost singlehandedly as a nation for causing the greenhouse effect.

That is how it is being reported in Brazil, that the whole rest of the world thinks they are causing it. And obviously, we know that deforestation as a whole only causes a very minor part.

They do not understand that we are working on these other issues. But even despite all of that, midlevel officials of the Ministry of Finance and of the Central Bank opened negotiations and discussions and informal talks with the Minister of Mines and Energy of Costa Rica just a few weeks ago, to find out what is all this stuff about debt-for-nature swaps.

They are half sponsoring, cosponsoring, a conference next week where I will be speaking on the potential for debt-for-nature swaps and other sorts of debt reduction programs, in reference to environment.

This is way before even the presidential elections. So people are positioning themselves to be able to take a different attitude after next November. What that in fact will work out to be, who knows? I mean, the potential outcomes from way right to way left in terms of the candidates for the Presidency of Brazil have a vast variety of approaches to the debt.

But basically, the civil servants are saying to themselves, "We need to be able to answer this in a much more rational tone," once the first Presidential elections, free Presidential elections, happen for the first time since 1964. That is going to be a major event in the political life of Brazil, and lots of things might be different here in 1 year's time.

Representative SCHEUER. Interesting. Mr. Bissell.

Mr. BISSELL. If I could just add one aspect to that, we have supported several small debt-for-nature swaps at AID working particularly with World Wildlife Federation in several foreign countries.

We have a unique opportunity in the 1990's. The sensitivity to the environment is such a salient political issue yet at the same time we have been able to work out some arrangements. American environmental groups, the U.S. Government, and banks understand now the mechanisms and the sensitivities. It is probably time to go for a big one.

I mean, it is time to go for a very large debt-for-nature swap. We are facing out there, in the course of the Brady plan, some very large values to be captured by somebody. Any process that involves a major write down—and we do not know what that is going to be—means that there is value to be captured.

It will either be captured or shared out by banks, by the debtor government, or by people in the private sector. And there is no reason why that portion of value should not be captured, in a year in which people care more about the environment than they ever

have before, by some very broad-scale, serious, environmental initiatives.

Representative SCHEUER. Initiatives? Would that take legislation?

Mr. BISSELL. Not necessarily. I think most of the legislation is in place. It would certainly take leadership that would involve both this government as well as the banks and the foreign governments that are involved in these debt reschedulings.

As I say, any banker can estimate what that proportion of value to be captured is. But it is there; even though we all say a loss will be incurred or something like that, in fact somebody will, or some cause will find value.

If we are really serious about debt for nature these days—and I think that we are—we have a rare opportunity over the next 12 to 24 months.

Representative SCHEUER. Where would you pick this major project? Would it be a global project on reforestation? Or, would it be a regional project involving a couple of countries in Latin America, maybe Central America, that would cut across development and environmental and conservation lines?

How would you structure such a major project?

Mr. BISSELL. I cannot structure it precisely. But from my understanding of the workout of the Brady approach, it would be country by country. And it would seem logical to me to in fact take this country by country.

Environmental groups and others have learned the sensitivities of those individual governments, whether we are talking about Mexico, Venezuela, Brazil, and others that are going to come up in some order under the Brady approach.

And it is really a major political opportunity for the United States to show that we still have the imagination and the leadership to undertake an initiative in this area, that we can convert what people call a major problem into a real opportunity.

Representative SCHEUER. That is very interesting.

Yes, Mr. Dale.

Mr. DALE. Just a quick word. We should not be surprised if these things are controversial for a time. There is lots of history of things being controversial that become routine, and nobody would give them a second thought.

For example, in 1949, living in Belgium during the Marshall plan, when I approached——

Representative SCHEUER. In Belgium?

Mr. DALE. In Belgium, yes.

When I approached the Government officials and had some talks with them about developing national accounts data, because they did not have any official national accounts data, they thought it was Aunt Molly meddling when she should not. They do not think that any more, because they use them, and they are obviously very useful.

But that kind of thing happened then. The exchange rates were very, very sensitive up until only a few short years ago, and now practically everybody talks about them publicly and tells the market what they ought to be doing.

So this is just at a stage of development where it is new. People in Latin countries, as we all know, have this mystical feeling about the land and things on the land and under the land. But that will all pass. And before you know it, it will become routine and something that we cannot remember when we were not talking about it internationally. So long as we practice what we preach, and make a genuine effort to understand their problems and help with their problems, as I am sure we can and will.

Mr. SEWELL. Congressman, let me respond, because you are setting out an analogy that needs more attention. If you are looking at the long-term methods of changing people's policies, there are essentially three elements, it seems to me.

One is the power of ideas, one is the need for financial support, and one is leadership. And in your own experience, you led on the population issue. It was not very long ago that we felt that we in the United States were alone leaders on the goals of population and family planning.

And in a similar manner, you among others were being attacked as trying to impose population control on the Third World. Now, it is fair to say that there is probably not a government that at least does not pay lipservice and a lot more to the need to limit population growth.

Representative SCHEUER. It was not so long ago that John D. Rockefeller——

Mr. SEWELL. Exactly.

Representative SCHEUER [continuing]. And I——

Mr. SEWELL. It was not so long ago that Dwight D. Eisenhower said you could never do it.

Representative SCHEUER. Yes. Yes, that is correct. And it was not so long ago that that marvelous, great human being, John D. Rockefeller, the third, I guess, and I were described as homicidal maniacs.

Mr. SEWELL. Exactly.

Representative SCHEUER. Because of our espousal of family planning for developing world peoples.

Mr. SEWELL. But it took the power of ideas, it took financial support from the United States, and it took leadership on those issues.

You are going to have to have the same kind of set of policies in the environmental field.

Representative SCHEUER. And we are going to have to revert to our former status of leadership in international family planning programs. Our current posture on international family planning is an absolute disgrace.

And to his credit, Barber Conable in his speech the night before last—and I will send it to you all so you will not have to wait for the printed record—made that point very clearly. He recalled to me that, when we were in Congress together 20 years ago and I was developing a piece of legislation that turned out to be title X, rationalizing a whole family planning legislative framework—he remembered for me that there were only two Republicans who we could always count on for support. This was during 1967 to 1970.

One of them was Bob Taft, the nephew of the Senator, and the other was a chap by the name of George Bush. And George Bush wrote extensively in those days about the need for thoughtful, en-

lightened family planning programs. He joined in a number of initiatives with me and the World Bank president.

Anyway, Barber Conable expressed the clear hope and the clear expectation that George Bush would soon begin to exercise the leadership that he showed during the 1960's of which he was capable, and that this enlightened, thoughtful point of view on family planning both at home and abroad would shortly emerge.

If a developing country had an additional bundle of dollars to spend for feeding the hungry, providing health care and education for the poor, for preserving the environment, for servicing the debt, or investing in its own enconomic productive base—how should they decide, by what criteria should they decide where the next dollar will be spent or invested?

Mr. SEWELL. Well, I will respond first, and then Bill Dale may. But they do not have any choice; they pay back the debt, by and large. They first of all start paying back the debt to the World Bank and the International Monetary Fund, because you are not allowed to go into arrears to those institutions. As far as I know, nobody has gone into arrears quite yet with the Fund.

Mr. DALE. Yes, they have.

Ms. BRAMBLE. Yes, they have.

Mr. SEWELL. Have they?

Mr. DALE. Oh, yes.

Representative SCHEUER. Have they gotten away with it, Mr. Dale?

Mr. DALE. Gotten away with it in the sense, in the very limited sense that they are still members, they have not been thrown out, and they have not been thrown in the brig, if you want to put it that way.

Mr. SEWELL. But most countries do not have any choice.

Representative SCHEUER. Well, let me recast that question, Mr. Sewell, we will get back to you in a second.

Shouldn't the World Bank and the IMF and the regional development banks be at the forefront of those who would be willing and interested in carving out some new initiatives?

Mr. DALE. In rescheduling?

Representative SCHEUER. In debt rescheduling and debt redesign, and new financing that would be integrated into rescheduling the old debt so that you could do some creative thinking about rescheduling the old debt, making it junior, stretching it out, reducing interest rates, so that new debt then would become economically viable.

If we cannot rely on thinking in the World Bank and the regional development banks, if we cannot rely on them for that kind of creative thinking, how can we assume that the Chase Bank and Marine Midland are going to be exercising those initiatives on their own?

Mr. DALE. Well, I am of two minds on this. I guess I could argue either way.

Representative SCHEUER. Spoken like a Philadelphia lawyer.

Mr. DALE. Right. Yes, I am not from Philadelphia, and I am not a lawyer, but anyway [laughter] let me put it this way. Clearly, for those two—when I say two, I mean the World Bank and the IMF, but I mean to include by implication the regional development

banks—the big financial issue of public interest for these enterprises is their net lending.

If that is right, and I think it is, then the question is, will they make more net contribution, net lending, with rescheduling or without? That is the issue.

Now, if they reschedule, then in order to maintain a given level of net lending they are going to have to have their resources replenished by a larger amount and/or more often. There is only one place in the world where that issue can be solved, and that is here on Capitol Hill; not down at their headquarters at 18th and 19th Streets, respectively.

Everybody else in the world, including all, substantially all the other parliaments in the world, are ready to go. So you know more about it than I do, Congressman. The administration——

Representative SCHEUER. Well, for the record——

Mr. DALE. The administration, this administration and the previous one have been, in my opinion, unnecessarily and unduly cautious and shy about giving, providing resources and if necessary—I am searching for a word—bearding the Congress——

Representative SCHEUER. Yes.

Mr. DALE [continuing]. In order to get them——

Representative SCHEUER. Do you think central bankers around the world in major capitals as well as parliamentary leaders around the world are ready, are showing more flexibility and are showing a readiness for creative banking and resizing these loans, than is found in Washington, I take it?

Mr. DALE. Yes.

Representative SCHEUER. Do you think there is more flexibility, more creative initiatives in play around the world, in parliaments and in the central banking board rooms?

Mr. DALE. Oh, comparative judgments like that are very—let me say for the sake of discussion, yes. OK?

Representative SCHEUER. OK. What is it going to take to get the United States to move into that posture of thinking creatively about how we can restructure and refinance these loans, how we can make it economically attractive for the private banking system to put on new debt to fuel the engine of development which we hope will be sustainable development?

What do we have to do here at home to get that process started?

Mr. DALE. That is a very tough question. Candidly, I do not have the answer to that. If I had the answer, I would be shouting it from the housetops. Because implicit in that means solving an awful lot of other problems, including Gramm-Rudman-Hollings and all that.

But I do not want to hog the floor, Congressman.

Representative SCHEUER. Well, this is an important question.

Mr. DALE. Yes, of course it is. So let me say for the record that I remain, so far, true to my history I guess, opposed to rescheduling by the World Bank and the regional development banks and the IMF. Not just for historical reasons, but because I have not been able to see how you can, given the political problems of replenishing their resources, maintain or increase adequately their level of net lending in that way.

I want to be open.

Representative SCHEUER. Mr. Sewell, I think I interrupted you.

Mr. SEWELL. Well, I was just going to say that I do not think that one should neglect the fact that the proposals of Secretary of the Treasury Brady are a great advance. Now, as we sit here in June, it is a country-by-country approach, and is being brokered out as we speak for the first case, which is Mexico. And there are large questions about how the players in this exercise—the Mexican Government, the commercial banks, the international financial institutions, and the U.S. Government—are finally going to end up when they put their cards on the table.

It is going to require relief for the banks, the commercial banks. It is going to require much greater debt reduction from Mexico. It is going to require, probably, additional changes in Mexico itself—and Bill Dale may know better than I do about the exact figures about what the World Bank and the IMF have indicated they are willing to put up.

But the principles that the Secretary of the Treasury enunciated are a considerable advance from where we were before.

Representative SCHEUER. Did the Secretary of the Treasury announce, in connection with the effort going on in Mexico, any policy on factoring in environmental concerns and improved environmental behavior——

Mr. SEWELL. Not to my knowledge, but I am not the one to ask.

Representative SCHEUER [continuing]. As a condition for these loans? And requirements for sustainable development policies.

Ms. BRAMBLE. He did not. He has been asked by me, by Mr. Riley from EPA, by Senators Wirth and Heinz, by any number of a lengthy list of other people, and he says he has enough problems trying to get the parties to the table under the Brady plan without complicating it with these other issues.

Representative SCHEUER. You say Senators Wirth and Heinz both asked him?

Ms. BRAMBLE. Yes.

Representative SCHEUER. Any Members of the House, do you know?

Ms. BRAMBLE. I do not know for sure, but I would guess—if they have not done it overtly in terms of a letter they probably have informally. Mr. Umaña from Costa Rica, the Minister of Mines, Energy, and Natural Resources, was here a couple of weeks ago, also asking for the same thing. Costa Rica is about to become one of the early sort of guinea pigs under the plan, and said, "We would like to talk specifically about what I would like to call structural readjustment, or what other people call green conditionality or some other way to say we qualify for decent debt relief, because we have a new vision of development." And they were rebuffed, very overtly.

Representative SCHEUER. That is unfortunate.

Did anybody else want to answer that question, as to how you, as a Third World chief of state, would spend the next dollar that you might acquire on any of these almost agonizingly important priorities?

Ms. BRAMBLE. I would like to answer it in a way that is not an answer, but it is something I have thought a great deal about, because it is in this paper I am delivering next week in Brazil.

They have, as I said, just come out of a long period of decades of military rule in which the public, or what they call the civil society, has taken very little part in any of the debate or decisions about the kind of things you are asking about.

There is the potential for the first time in 25 years for there to be in fact a debate about what money should be spent on in Brazil. So it is not a question for the present chief of state there, at all. And it probably should not be the kind of thing that the next chief of state decides on his own, the way things have been done in Brazil for 25 years.

It is clear that Brazil is a wealthy country in many ways, and if they had some debt relief they really would have some disposable income to decide what to do with. And I think the people of Brazil want to have some role in deciding what that is.

There are enormous popular movements in Brazil who know a whole lot about the immediate needs in education and health and environmental protection, and they have not had a chance to say a thing in decades.

Representative SCHEUER. We are on another rollcall vote, and I have about 6 minutes. I can stay 2 minutes beyond the next bell, so we are really very limited in time now. I do not have the heart to ask you to wait while I go over and vote.

Mr. Bissell, do debt-for-nature swaps, as they have been articulated up to now, do they provide adequate funds to manage conservation programs created by them into the foreseeable future? Or, will they create additional funding needs in those host countries?

In other words, will these programs be sustainable, or are they going to be sort of repossessed by the governments as they become more able financially?

Mr. BISSELL. Congressman Scheuer, you have put your finger on an interesting problem which is that many of the conservation projects that have been considered have substantial maintenance costs over the long term.

We are dealing in a world today where budget support in developing countries is no longer a free good. In the bad old days, when currency printing presses ran freely, budget support was less of an issue. Today, under the tight discipline that most developing countries are trying to achieve over their budgets, they have to choose. That is, do they put that additional dollar into sustaining a conservation project, or do they put it into a very long laundry list of alternative budget uses?

We have to be sensitive to that as donors. And one can try to deal with the situation in debt-for-nature swaps in creative ways. For instance, I would like to have authority to create endowments in the process of doing debt-for-nature swaps which could help to lessen the immediate costs for host governments, trying to set aside some kind of funding en bloc that would allow those conservation efforts at least for some time to be sustained.

A second way, of course, to deal with it is to in effect make them self-sustaining projects. As you indicated earlier, some of the most important ideas are those proposals that, rather than setting aside preserved areas, in fact provide for sustainable yields, for instance, from the rain forest.

Approaches like this which create economic incentives within the projects themselves are ones that are most durable, where the local populations achieve an economic stake in those conservation gains.

We have tried this in a number of areas. We have supported some work by the IUCN in Geneva to do catalogs of these projects, ranging from tourist facilities in Thailand to projects in the Andes. The blueprints are out there to do these activities.

They involve a tremendous amount of work. We are very grateful for the work of conservation organizations who go in and work on the ground with local populations to design those projects. But that is the kind of context, it seems to me, that we need to think about in doing debt-for-nature swaps.

We have enough examples on the books so far that I think we can make some real progress.

Representative SCHEUER. Yes, Mr. Dale.

Mr. DALE. Could I make one suggestion for Mr. Bissell to think about as they go forward with what I hope is a big debt-for-nature swap that he spoke of earlier?

It strikes me that, if you are going to provide endowment and do other things to reduce the maintenance costs for debt-for-nature swaps, one result is that the focus of the swap necessarily has to kind of come down to a smallish objective.

I wish they would think about what the World Bank thought about; namely, do not lend just for projects, lend for structural adjustment.

How about debt-for-nature swaps for structural adjustment of environmental policies? That might be worth some consideration.

Representative SCHEUER. And for sustainable development policies.

Mr. DALE. Perhaps.

Representative SCHEUER. Well, the bells have gone off, and I must get over there.

I cannot thank you enough for your patience and forbearance. The Sun has long since gone over the yardarm. It is now well after 5 o'clock. We have been here almost 3 hours.

I am very grateful to you all for really a splended hearing. Thank you so much.

The hearing is adjourned.

[Whereupon, at 5:10 p.m., the subcommittee adjourned, subject to the call of the Chair.]

SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH IN THE THIRD WORLD

TUESDAY, JUNE 20, 1989

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:50 a.m., in room 2261, Rayburn House Office Building, Hon. James H. Scheuer (member of the subcommittee) presiding.

Present: Representative Scheuer and Senator Gore.

Also present: Frankie King and Orhan Yildiz, professional staff members.

OPENING STATEMENT OF REPRESENTATIVE SCHEUER, PRESIDING

Representative SCHEUER. Today is the third day in a series of hearings on sustainable development and Third World debt held by the Subcommittee on Technology and National Security of the Joint Economic Committee. These hearings were undertaken because of a growing concern that economic development policy in much of the Third World is badly misdirected and concern that it is focusing on short-term economic benefits and neglecting the long run consequences for a nation's environment and for the natural resources patrimony of peoples all over the world.

We are concerned with policies in agriculture, we are concerned with policies on development, we're concerned with policies of harvesting forests that are not sustainable and that in the end will kill the goose that laid the golden egg.

The hearing record of the 2 prior days of hearings has provided ample confirmation of our initial concerns. In the first hearing we explored the concept of sustainable development and determined that the only strategy for national economic development which makes sense for the long term or even to the midterm is one based on integrating concerns about the environment and population with more traditional concerns of income growth, productivity and expansion of the gross national product.

Unfortunately, a major conclusion of that first day of hearings was that too few countries are basing their development policies on the concept of long-term sustainability.

In our second day of hearings last week, we explored one of the major reasons why many developing countries are failing to pursue sustainable development. Witnesses at that hearing testified that

the economic and environmental problems created by the excessive debt burden, the burden of servicing that debt, both interest and principal repayments, have served to undermine sustainable development and encourage actions and policies which damage local environments and threaten future generations with impoverishment rather than development. It's an irony that the existence of Third World debt which originally was entered into at least by Third World countries to enhance their development now is a powerful force eliminating and degrading their development.

So these two hearings have painted a rather dark picture of the future for many developing countries, but the current reality is not entirely discouraging. In many countries, enlightened leaders from both the public and the private sector have heeded the message of sustainable development and sought out creative ways of combining environmental enhancement with economic development.

Today's hearing will provide an opportunity to review some of the successful experiments. To a large extent, today's hearing is the most important one of this series, for while analysis can give us a keen understanding of the problems facing developing countries, only the careful study of successful examples can give us the hope and the commitment needed to move forward and defeat these problems.

For today's hearing we are fortunate enough to have five witnesses who have had enormous experience with successful attempts at combining environmental enhancement with economic development. Mr. Thomas Lovejoy of the Smithsonian Institution is a pioneer in the field of debt-for-nature swaps. We will hear from him on that subject. Mr. Michael Lipton of the International Food Policy Research Institute is a world authority on environmentally sustainable rural development. Mr. Walter Reid of the World Resources Institute is the editor of a recent book which examines successful projects in sustainable development around the world. Mr. Michael Whelan of the Whelan Group is a noted consultant to the international development institutions on the techniques of successfully managing sustainable development. Mr. Leonard Robinson of the African Development Foundation has many years of experience implementing sustainable development programs in Africa.

We are delighted to have you all. Let me say, we hope that when you testify it will be in a relaxed, contemplative environment, that you won't necessarily rigidly adhere to your prepared statement. Your prepared statement will be printed in full in the record. So just consider that we're all sitting together in a living room and that you are ruminating, giving us the benefit of your experience and your insights.

Why don't we start as I introduced you. Each of you take 8 or 10 minutes and then I am sure I will have some questions for you.

We are delighted to welcome you. Tom Lovejoy of the Smithsonian Institution.

STATEMENT OF THOMAS E. LOVEJOY, ASSISTANT SECRETARY, EXTERNAL AFFAIRS, SMITHSONIAN INSTITUTION

Mr. LOVEJOY. Thank you, Congressman, for this opportunity to speak on a subject that can be no more central than any in terms of how human society is relating to the global environment. Clearly, we have no choice but to seek ways to improve our development and move it in the direction of sustainability.

Sustainable development is a somewhat difficult concept. It is hard to come up with operational definitions for it. As a biologist, I would make the point that it is best measured in biological terms. If you look at it at the global level with all the pollution of the atmosphere and the triggering of global warming, those are not problems of any consequence, unless they affect biological systems. There is every indication that they, in fact, will do it in very dramatic ways.

In any event, I just want to point in the direction of looking at sustainable development in terms of biological diversity, which is poorly known in tropical nations and which is therefore a hurdle that we have to get across in terms of using it as a measure of sustainable development.

Clearly, there is a need for a lot of pilot projects, ones that can then be moved onto a commercial basis. There is a need for a serious investment in research in these countries, both on biological diversity and on sustainable development systems. There is a need for training; there is a need for institution building: activities that the Smithsonian would be more than happy to participate in. But that's not my purpose for being here this morning.

When one looks at development, it is clear that environmental costs are rarely factored into the accounting. That's why we're in trouble. As one looks across the planet at tropical deforestation and the burning of the African savannas or whatever one chooses to look at—and you clearly have heard plenty about it in previous hearings—the problems and development and environment on the continent are massive. They are complex, and we have no choice but to bend to resolving this terrible conflict.

All of this in the end will take financial resources and, that is the point I wish to speak to this morning. Because as I look around for potential financial resources to address this problem at the scale and at the rate at which it exists, I see relatively little other resource to turn to, other than debt. As a resource that has been used for those purposes so far, it is a relatively neglected resource. I think the total amount of debt-for-nature swaps has perhaps been on the order of $80 million and in a small number of countries. I have a background piece on that which I would like to submit for the record.

[The background piece follows:]

Since first proposed in 1984, the attached list of debt-for-nature swaps have produced significant positive results, and, given their financial structure, have neutralized in-country fears of domestic inflation.

Debt-for-Nature Swaps:

1) mobilize and multiply financial resources because of the difference between the face value and the secondary market price of international debt.
2) channel financial resources for conservation
3) strengthen institutionally local conservation organizations
4) neutralize potential inflationary impact of swap through the issuance of bonds.
5) foster international cooperation among political, financial and environmental groups at both governmental and non-governmental level.
6) guaranty financial stability for local NGO's and allow conservation organizations to match cash flow needs with bond amortization.
7) reduce a country's debt load
8) reduce scarce foreign exchange outflows
9) improve commercial bank's portfolios

To the best of our knowledge, approximately US$ 86 million in debt-for-nature swaps have been executed on a global basis. This total over a 4 year period represents less than just one of the myriad commercial debt equity transactions to date.

Costa Rica has already executed approximately US$ 75 million in debt-for-nature swaps and has approved another US$ 45 million over the next three years. The governments of Holland and Sweden have participated in debt-for-nature swaps for US$ 33 million and US$ 25 million, respectively. Bi-lateral deals offer the possibility for greater amounts and action, especially in the case of the United States. As you can see from the attached, less than US$ 22 million has been swapped by U.S. institutions. The U.S. government or multilateral lending organizations have not played a direct role in any deal to date.

The Costa Rican debt-for-nature swaps represent 5-6% of the country's total commercial bank debt.

Ecuador has swapped US$ 10 million and reportedly has another deal in the works.

The Costa Rican and Ecuadoran deals have been debt-for-debt swaps. This substitution of external for internal debt (local currency bonds) for the most part eliminates the fear of domestic inflation, a major concern for developing countries.
The Philippines did a US$ 390,000 debt-for-cash swap. Bolivia similarly executed a US$ 650,000 swap for cash and expansion of the Beni Reserve.

Mr. LOVEJOY. The point I think that has to be made here is that debt for nature, as a term, has to be thought of in really very broad terms. It has to be thought of to include research, old-fashioned kinds of conservation like national parks, institution building, pilot projects and sustainable development in forestry or whatever. We have to take a very broad view of what we mean by conservation in this context.

Two problems have been raised about debt-for-nature swaps which I would like to talk about briefly. Almost every time a debt-for-nature swap has been suggested, one of the first objections that's raised is that there might be an inflationary effect from dumping large amounts of local currency into a local economy. I find it curious, in fact, that such objections are rarely raised when commercial debt swaps are being proposed, but one very useful thing has come out of that objection.

In Costa Rica and Ecuador, to avoid this potential inflationary problem, most of the conversion was made not into cash but into interest-bearing instruments, into bonds. This provides a fiscal, financial stability, but it provides something even more important. What it provides is the chance to furnish institutional stability, whether to a national park or a research institution, a training institution, or an entire park system. One can essentially endow these activities so they have as long-term future, because, as anybody who has spent any time working in the developing world knows, the institutions are subject to an extraordinary fluctuation of resources, a real feast or famine cycle, which, in the end, might as well just be permanent famine, because it is just about impossible to digest large resources after a period of very low economic support.

So I think there is a tremendous opportunity here to set up a series of programs and activities in these countries which, in essence, can operate in perpetuity and save them from one of their greatest difficulties; namely, institutional instability.

A second problem that has been raised is that there might be some infringement of national sovereignty. This is sort of thinking about a debt-for-nature swap as though we were about to enter into some giant ecological Louisiana Purchase: as if the United States or some industrialized nation would simply buy up the Amazon or one of the islands in Indonesia for itself, and that, of course, is not what we are trying to do at all. What we are trying to do here is to provide financial resources through appropriate activities in these countries which are proposed by the countries themselves.

There is really a multitude of ways one could set these things up. Most of the ones done so far have involved private foundations in Ecuador, for example, and Costa Rica. It is perfectly possible to think of other ways to set them up, and I will tell you the one thing that has really impressed me most since I proposed the debt-for-nature idea is how facile and imaginative financial minds can be when they address a problem like this.

So I think we have only seen just the very tiny little beginning of the various possibilities that might be done with these resources. If, in the end, it turns out that there is sort of a stigma attached to the word "debt," there is no reason we can't take some of the debt and turn it into other kinds of financial units which would be re-

served for environmental purposes, and call them environmental drawing rights or whatever would seem to be a more palatable term.

All we are really talking about is providing financial resources. What really concerns me at this particular moment is that the debt-for-nature opportunity may be a very fleeting opportunity. We hear debt relief and debt restructuring discussed all over the place. It is in the papers everyday. It is discussed within the administration, and I fear that if somehow we cannot make the environment as a point of principle, meeting environment of the broadest sense, as I was talking about before, a point of principle in all such structuring and relief discussions that we will basically have lost our one opportunity to marshal resources on the scale we need to address this major conflict between development and environment.

Indeed, it is my hope that as the economic summit gathers in Paris around the Bastille Day celebrations and the 200th anniversary of the French Revolution, that the rights of man will be recognized to include the right to a healthy environment, and as they discuss environmental issues and as they discuss economic issues, that the point, debt for environment, debt for nature, whatever one wishes to call it, can emerge and be adopted by those countries as a point of principle in future negotiations.

Thank you very much.

[The prepared statement of Mr. Lovejoy follows:]

PREPARED STATEMENT OF THOMAS E. LOVEJOY

I am Thomas E. Lovejoy, Assistant Secretary for External Affairs of the Smithsonian Institution. I am a tropical biologist and have worked on international environment problems, particularly those of the tropics, since 1973.

I would like briefly at the outset to dwell on the topic of sustainable development of which, like Sylvia, can be asked,

> "...what is she
> that all our swains commend her?"

Not a word of criticism can be directed toward this wonderfully sounding concept. But I would assert that by in large, a definition of sustainable development has been as elusive as the will-o-the-wisp.

The critical part of the definition is the ecological one, for what is economically sustainable may vary with time, whereas ecological limits do not. To quote my colleague Mats Segnestam of Swedish International Development: "you can't negotiate with the environment." My definition is any economic activity going on in a large unit of landscape -- such as a river valley -- so that its biological diversity persists in perpetuity. In other words, the full characteristic array of plant and animal species must be maintained somewhere within the landscape but not within intensively used portions of it. Species are often endangered and lost before there are major changes in regional processes and biogeochemical cycles, and always in tandem with them. They are the litmus paper of environmental change.

Given the superficial knowledge of biological diversity which is far greater a problem in the tropics than here, there is a long way to go to make it operational. That includes scientific survey and analysis such as proposed in the National Biological Diversity Conservation and Environmental Research Act,

H.R. 1268. But even so, the number of endangered species is an indication of ecologically unsustainable development. And looking at the planetary scale, the accelerating loss of biological diversity clearly points to our having exceeded the carrying capacity of the planet because of the way we, humanity, have been living on it.

I think anyone who has given consideration to the problem of sustainable development realizes two things:

1) that the lack of consistent accounting for environmental costs leads to a general trend for development to be less than sustainable; and

2) as a consequence very concerted efforts have to be made from the environmental point of view to right the balance.

This is hard enough to do in our own country, which is far from perfection, but it is an almost unimaginably large job in developing nations. They are blessed in one sense with the greater part of the planet's biological diversity but hindered by complex and delicate ecologies which often render simple temperate zone approaches to development unworkable.

The bottom line of all this is that there is a very large job to be done to ensure conservation and sustainable development in the developing world. It is going to cost a great deal, and none of those countries are in a position to invest in environmental protection, research, training and pilot sustainable use projects at a level even approaching that which is needed.

The need is large. From where can the necessary resources come? As I look around, even were Japan, for example, to devote

all of its foreign aid to environmental programs, there is nowhere else to turn for most developing countries than the international debt. Since I proposed debt for nature swaps in 1984, there has been a modest amount of activity. Costa Rica has been the front runner with 120 million dollars approved of which 75 million has already been executed. The 120 million represents 5% of Costa Rica's commercial bank debt. Billions upon billions of debt for equity for commercial purposes have been executed.

Curiously one of the objections often raised is the potential inflation problem from releasing large amounts of currency into the local economy. One rarely hears this concern raised about commercial debt swaps, which indicates just how poorly the consequences of environmental degradation for economies is really understood.

The response to this concern of creating bonds or other interest bearing instruments has nonetheless been fortuitous, because it raises the possibility of permanently endowing key projects and institutions. Institutional instability consistently bedevils efforts of many sorts in these nations. The dual consequence of this approach is fiscal and institutional stability.

Another point of great concern is the potential infringement of national sovereignty. In my view this is entirely a red herring. No country and no organization is seeking to buy portions of another country like some ecological Louisiana Purchase. No country is seeking to thwart aspirations of another for development. No environmental project in any country ever succeeds in the end unless it is essentially indigenous. Such concerns rise more out of misunderstanding about the relationship between environment and development than anything else. If debt is an onerous term with "heavy" implications, then let's think of some more appropriate term like "environmental drawing rights".

The key here is to look at international debt as a financial instrument which this and other industrialized nations are willing to turn back to local control for mutually agreeable purposes.

The main point I want to make is that the global environmental problems are so vast, the time is so short to do something about them, and the debt window might be so ephemeral, that we must move very quickly to seize the one opportunity we may ever have to truly address the environmental crisis on the correct scale. We must seek ways to make environmental considerations a point
of principle whenever debt restructuring or debt relief is discussed. France should be encouraged to include environment in its consideration of forgiving a portion of the debt to the 35 poorest nations. The Bastille Day summit should include debt in its consideration of environment. This is a matter for the World Bank, the IMF, the regional development banks, and bilateral agencies.

Debt for nature is not going to solve any nation's debt problem. Nobody has ever pretended that it will. Nor is it necessary for this mechanism to be restricted to environmental concerns. It could be extended to cultural ones as well, and it might well be that in some instances a package for cultural and biological heritage might be more palatable politically. The Smithsonian, for example, is looking for ways to fund or endow bilateral research and training activities in a number of countries.

Debt for nature swaps have largely been achieved so far by purchase of discounted debt. This was limited by the working capital of U.S. conservation organizations until the Swedish and Dutch governments entered the Costa Rican debt swap. IRS ruling 87-124 improved the tax consequences for donations of debt by

commercial banks, but it is still more favorable for their bottom lines to sell the debt rather than donate it. I am well aware of the political hurdle represented by any measures that would be viewed as bailing out the banks. Yet I think the concern about the tax consequences to the federal government are illusory. It is clear there will be red ink somewhere so let's get something useful -- indeed vital -- in return.

In sum, Mr. Chairman, I see a planet in very grave trouble and with one chance to snatch the financial ring that can rescue it. We had better grab it.

Representative SCHEUER. Thank you very much, Mr. Lovejoy. We will go ahead with Michael Lipton. Please take your 10 minutes.

STATEMENT OF MICHAEL LIPTON, DIRECTOR, FOOD CONSUMPTION AND NUTRITION PROGRAM, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Mr. LIPTON. Thank you. I was asked four questions. First of all, to examine the relation between incomes, Third World poverty, and environmental degradation.

Now I am surprised at just how much the farmers of the Third World do protect their own environments. If you and I lived as they do, we should be tempted to use up our environments pretty fast. Obviously, they are poor. They have little insurance. Survival now and next year has to come first. So the case for conserving the rural resource base—for old age or for one's children—might seem remote. That is especially the case in much of the Third World; not many people live to be very old; many of their children abandon their rural base and look for work in cities. These incentivies encourage degradation of both private and common rural property.

When the rate of interest is very high—and poor people in the rural Third World commonly pay 25 to 50 percent in real terms—investment in long-term conservation of private property is not appealing; "soil mining" is. National agricultural researchers are often paid, and pressured for innovations that increase short-term yield, not long-term sustainability.

Meanwhile poverty and population growth also do several things to encourage the degradation of common property resources. CPR's are rights to fuel wood, water, grazing, or fishing, which may be used by any member of a group of "entitled" rural families or villages. Increasing poverty means that there is more and more pressure to use that common property up, to graze more animals on the common lands, and so on.

And, of course, population growth and squatters mean that more and more people are trying to do that. All that means that it is more and more expensive to supervise the common grazing, and more and more people have to share the limited benefits of that supervision, so that it is quite easy to understand how these common property resources get more and more overused and degraded.

So, as I say, I am surprised that poor farmers of the Third World often do husband resources rather carefully. I am interested in how national and international policy can encourage that natural tendency.

Certainly, when poverty declines, that helps in assisting farmers in protecting their environment. Nevertheless, some of the methods by which rural poverty has been attacked in the short term have increased environmental degradation, overexploitation and the erosion of marginal lands and water resources—for example, via irrigation systems designed only with a short view and tending to use up groundwater. Perhaps above all, so-called "low-input, high-output agriculture," sounds marvelous, but, in fact, it is usually dangerous nonsense. Unless you increase the efficiency of inputs which are sustainably converted into salable or edible farm out-

puts, then low-input, high-output agriculture is just another word for soil mining.

A lot of people say that population pressure is to blame. That is, indeed, in a sense, true, but we must be careful not to blame the victim. Parents are usually rather rational at deciding how many children to produce. If they have large families, it is because they know that many of the children will die young, others will be unemployed, and even the employed will often be uneducated and thus not able to support them in old age. So that pressure to have a lot of children comes really from the pressure to ensure survival.

So what we have so far is that farmers are actually looking after their environment surprisingly carefully, and where they are causing populations to increase, it is not due to what the colonial censuses in India called "improvident maternity," nor at all to mistakes that parents were making, but to the driving forces of poverty.

So what outside actions are causing needlessly rapid degradation of rural resources? We tend to blame mainly Third World governments, which have certainly made serious mistakes, but I want to draw attention to at least four ways in which we of the developed world are indirectly encouraging poor rural people and their governments to degrade their environments and the world's.

First, through the 1980's, actions by Western monetary authorities have been pushing up real rates of interest, including those paid by governments and rural people in the Third World. That is partly because budget deficits in some Western countries increase the demand for foreign lending. It is partly because some Western governments act so as to increase or maintain an artificially high level for the real value of currencies in which Third World debt is denominated, especially dollars. The need to pay off debt at artificially high interest rates in artificially overvalued currencies makes Third World governments desperate for shortrun outputs and taxes from farmers, so they can meet their obligations. That means that neither farmers nor governments have much spare cash to pay for investments in longrun environmental maintenance.

Also when real rates of interest are high that affects incentives to rural borrowers. What a high rural rate of interest is saying to them is: income now means a lot and income in 10 years doesn't mean a lot. It is a discouragement from "thinking long." Investment in the environment to maintain the environment for the distant future becomes prohibitively expensive. And that is partly due to policies affecting real interest rates which are made in the West.

Second, European farm policies have tended to depress and destabilize world prices for many Third World products. That not only reduces the cash available for Third World farmers and governments for all purposes, but it particularly reduces the incentive to use that cash to maintain the longrun capacity of farmland.

Third, Western governments have denied the international agricultural research system the resources it needs to improve the sustainability of farming. For example, international crop research institutes want to examine fertilizer application practices as they affect the use of tropical soils over long periods. But that needs much more land, labs, and cash than does the standard single-

season research. So does the vital task of increasing and preserving the diversity of high-yielding food varieties and plants, and of the environments where they grow well. Yet real resources for the consultative group on International Agriculture Research—which finances such crop research centers as the International Rice Research Institute in the Philippines, and the Wheat and Maize Research Institute in Mexico—have hardly risen for several years. It is high time that the West sought new sources of financing, and invited the Soviet Union to play its full part in supporting the international agricultural research system, as today it does not do.

Fourth, we have encouraged international lending agencies to shift financial support away from agriculture and away from the poorest countries, and toward general-purpose loans for import support—that is, in practice, toward debt relief for higher income developing countries, and indirectly for commercial banks in developed countries. The proportion of World Bank triennial disbursements which went to agriculture and rural projects fell from 30 percent in 1977–79 to only 17 percent in 1986–88. The real value of these agricultural disbursements fell by 23 percent in constant dollars. That doesn't leave a lot for the support of environmental programs.

Your second question concerned the strategies to relieve poverty and population pressures on the environment in developing countries. I shall say just a few words about the three main antipoverty strategies—public works, food distribution, and asset distribution—as regards their environmental effects in India, which has the most experience of these schemes.

(*a*) Public works programs have major capacity to be used against environmental degradation. Irrigation and drainage maintenance, in particular, can control seepage from canals, and can permit clearance of waterweeds.

India's most celebrated antipoverty program of public works is the Employment Guarantee Scheme of the State of Maharashtra which guarantees slack-season work at low wages within 5 miles of the home village. The EGS depends heavily on a big "shelf" of well-prepared works projects. As the shelf becomes barer, the scheme becomes less successful. Sustainability of these schemes is a financial issue, not only an environmental one.

However, most evaluations of the scheme are favorable. Especially in bad years, it provides several million persons per day with slack-season work. And it has, I think, had substantial environmental impact for the good.

(*b*) What about food distribution schemes? If they reach their target, the undernourished poor, there are good environmental side effects, because these poor households become less desperate for want of income to buy food, and are then less likely to be driven to degrade marginal lands and common property, especially fuelwood. Extra food in such households can help solve environmental problems.

However, untargeted schemes of food are fiscally unsustainable. Carefully targeted programs, such as the World Bank-supported Tamil Nadu Integrated Nutrition Program, have proved to be much more successful.

(c) The third and last group of poverty-related schemes is the redistribution of assets. Here land reform is the most famous example. It tends to raise output and, indeed, improve environmental surveillance of the land, but, of course, has met major obstacles in terms of people who don't actually want to have their land taken away from them for nothing. It is only reasonable to talk about land reform in practice if the resources or compensation of the users are there, and generally, they have not been.

There has been a major scheme in India to create new nonfarm assets for the rural poor, called the Integrated Rural Development Program. For the poorest households, it seeks to provide them with a productive nonland asset, usually a milch cow or buffalo. That has already pulled about 8 million rural Indians above the poverty line. In spite of a great deal of diversion of funds, corruption and all the problems we know about, it has had a major impact on rural poverty. However, as it has led to the raising of more cattle on commonlands, it carries risks of environmental degradation.

The third issue I was asked to address was the role that women and children can play in improving sustainability of the development process. Now women have worse prospects for education and good jobs and promotion, in developing countries especially. Men are more keen to defend their privileges when access to such prospects are particularly scarce.

If the resources exist only to put one child through high school, it will usually be a boy, because school will do more for his chances of a better income than for his sister. Even if food is short, it will be adult men who tend to get it first, because they have to be fed enough to seek and compete for paying jobs.

There is no evidence for the rather mystical view that women are somehow more proenvironmental in their farming behavior than men. However, women are in many respects more vulnerable to the effects of resource degradation, because in Third World rural society it is the women who are quite literally the hewers of fuelwood and drawers of water. As intensive farming spreads away from the village lands, women must walk farther and farther, using more and more time and energy to obtain fuel, wood, and water. Studies in Nepal by Mr. Kumar at the International Food Policy Research Institute have shown how this reduces women's capacity to earn income in agriculture and to supply labor to agriculture in the busy season.

So degrading of the common resource environment, in fact, reduces the capacity of women to sustain agricultural production also.

Last, I was asked to look at technology transfer, education and training with regard to how they could increase the sustainability of development programs in the Third World. Of course, seeds and techniques can very rarely be transferred from temperate to tropical farming environments, but agricultural extension in the Third World can greatly speed up transfer from one farmer to another within a tropical environment.

An important and severely neglected area in agricultural extension for migrants, often called squatters, to new land—especially in marginal areas like the Chittagong Hill Tracts in Bangladesh. Such migrants receive little extension, because legally speaking they

don't exist. They are not supposed to do what they are doing on these lands. Lacking extension, they are prone to needlessly degenerate unfamiliar soils and to conflict, often equally needlessly, with traditional, tribal, shifting cultivators.

However, a lot of resources have been wasted, particularly in Africa in beefing up an agricultural extension system, when there is nothing much appropriate to extend. Here the first requirement is for more research. Transfer of research techniques, support and planning from the international system can greatly accelerate the process. These are ideal areas for aid, because the capital returns are high but long run. They take time and longrun capital that the country governments themselves cannot afford. Major gains in food production have been achieved through the interaction of national agricultural research systems and international centers with substantial funding and support from Western countries.

In Africa, however, only a small number of governments have been consistently willing to steer domestic cash toward national agricultural research and to train, pay, and encourage scientists to stay in the research systems. Without domestic government commitment on these matters, foreign support to national agricultural research is like pushing on a piece of string. Yet without good national agricultural research systems, international research findings cannot be transferred in a sustainable way. You can push in a new variety of maize or even of rice or sorghum, but if there is no good national research system, then those new varieties will not be protected against new, localized biotypes of pests and diseases. Therefore, donors should seek to provide capital and technical research support for national agricultural research systems to developing countries, but only those developing countries willing consistently to back such research with national commitments.

Where such requirements are met, it is not difficult to identify areas where research can go ahead with environmentally promising results. Particularly, research should seek to improve the genetic diversity and variety of the cropping system through new dwarfing genes for rice and improvement of horizontal resistance and tolerance to pests and diseases. Second, where rapid population growth is inducing a shift to move intensive agriculture, better use of nutrients and water is necessary to prevent degradation, and in fragile soils, there are serious knowledge gaps as far as nutrients are concerned. It is no use simply to pour in inorganic fertilizers into porous soils with little organic matter.

As for water, it is no use to try to make West African rice lowlands perform like Asian paddies. All too little is known about hydrology. So more knowledge of the local soil and water capacity to sustain production is needed first, if the agriculturalists themselves are to be sustained.

Finally, we need to recall the central issue. What needs to be sustained is not a particular form of farming or particular land use, but the capacity to support decent livelihoods. More and more of the world's poor derive their sustenance not from farming their own land but as workers, as farm employees. Yet the great majority of research into farming in the developing and developed world is not about farm employees, but about assisting the farmers themselves.

What we need to be looking for are patterns of farming that are labor-intensive and create jobs but that save resources, that substitute employment for resources. Let me give one or two examples. The placing of fertilizers in the root zone of plants uses more labor, but increases the productivity of small amounts of nutrient and thus substitutes employment for chemicals and the possible degrading and polluting effects of chemicals. The intensive management via crossbunding of irrigation, and intensive management of drainage systems, substitutes employment for water. And it is for these sorts of demands for labor—for employment-creating yet environmentally resource-sparing systems and techniques—that we need increasingly to be looking.

[The prepared statement of Mr. Lipton follows:]

PREPARED STATEMENT OF MICHAEL LIPTON

A. WHAT IS THE RELATIONSHIP BETWEEN INCOMES, THIRD WORLD POVERTY AND ENVIRONMENTAL DEGRADATION?

1. I am constantly astonished at the extent to which most farmers in the Third World conserve their environments. If you and I lived as they do, we should be very tempted to use up the private and common property available to us very quickly.

o These people are usually poor and uninsured. To such people, the guarantee of survival this year and next year is very important. The case for conserving the rural resource base - for old age or for one's children - might seem remote. That is especially the case in much of the Third World; not many people live to be very old; many of their children abandon their rural base, and look for work in cities. These incentives encourage degradation of both private and common rural property.

o When the rate of interest is very high - and poor people in the rural Third World commonly pay 25-50 percent in real terms -

investment in long-term conservation of private property is not appealing; "soil mining" is. National agricultural researchers are often paid, and pressured, for innovations that increase short-term yield, not long-term sustainability.

o Poverty and population growth also do several things to encourage the degradation of common property resources. CPRs are rights to fuelwood, water, grazing or fishing, which may be used by any member of a group of "entitled" rural families or village. Poverty increases the pressure on each "entitled" person to use up more of the CPRs (e.g. by grazing more animals on the commonlands). Population growth, meanwhile, raises the numbers of entitled persons. Poverty and population growth also increase the numbers of people in nearby communities - and the pressures on such people to encroach on CPRs to which they are not entitled. These effects increase the cost of supervising the CPRs: of rationing (or pricing) them for the legitimate users, and of keeping others out (or getting them to pay up). Also, population growth (and the degradation of the CPR) reduces the benefits per person of such supervision. Such effects cause common grazing, water and fuel to be increasingly overused and degraded.

2. So it is quite surprising that, in fact, poor farmers in the Third World husband resources rather carefully. Farming couples, even before they have children, seldom engage in soil mining. Instead, they seek to maintain land quality, often despite bad advice to the contrary. Even sharecroppers, liable to be moved off their current plot at year's end, seek to maintain a reputation with landlords as

not only energetic but also resource-conserving farmers. Common grazing and water rights for cattle are typically controlled quite skillfully in traditional pastoral systems, with clan leaders seeing that users rotate or cull beasts and maintain grazing.

3. Reduced poverty, higher average incomes, and secure tenure (even on very small holdings) normally reduce environmental degradation. That is partly because the beneficiaries can more easily borrow at reasonable rates of interest. Nevertheless, the degradation can be accelerated by some of the methods through which rural poverty is attacked: by high levels of pesticide use; over-exploitation and erosion of marginal lands; by irrigation systems designed without a longer view; perhaps above all, by the dangerous nonsense of believing that one should strive for "low-input, high-output agriculture" without specifying how to increase the efficiency with which nutrients, water and sunlight are converted into saleable or edible farm outputs.

4. The role of population pressure in linking poverty to environmental degradation is complex. Parents are usually rather rational in their decisions about how many children to produce. If the best prospect of a decent old age is the secure support of one or two educated children, couples prefer that. If the best prospect requires many children - because some will die young, others will be unemployed, and even the employed will be uneducated and thus can earn and remit little - couples feel they must produce many children. Ready access to cheap and aesthetic means of contraception of course also influences the choice. So does female education - by delaying

marriage, by informing potential mothers, and by raising the costs of extra children. Clearly, however, there is very little truth in the old idea that poor parents degraded their environments because of what the colonial censuses in India called "improvident maternity".

5. If farmers normally look after their environments (both in private property and in (CPRs) carefully, and if population increase is not a "stupid" result of decisions that cause environments to degrade, what outside actions are causing more rapid degradation of rural resources? We tend to blame mainly actions by Third World governments. Undoubtedly, these governments have made - and have been politically pressured to make - serious errors; above all, to neglect their rural sectors. Yet many of our own governmental actions in the West are also indirectly encouraging poor rural people to degrade their environments and the world's.

o Through the 1980s, actions by Western monetary authorities have been pushing up real rates of interest, including those paid by governments and rural people in the Third World, to unprecedented levels. This is partly because some Western governments have greatly increased the demand for foreign lending, so as to finance their own budget deficits. It is partly because some Western governments have so acted as to increase the real value of currencies (mainly dollars) in which Third World debt is denominated. The need to pay off debt at artificially high interest rates makes governments desperate for short-run outputs (and taxes) from farmers, so that neither farmers nor governments can pay for investments in long-run environmental support. More fundamentally, the rising real interest rates also

affect rural borrowers' incentives. Even quite wealthy farmers are discouraged from "thinking long". For poor farmers normal, conservationist behaviour becomes prohibitively expensive.

o Especially in Europe, Western governments have been adopting domestic farm policies that depress and destabilize world prices for many Third World agricultural products. This diminishes both the cash available to Third World farmers (and governments) for all purposes, and the incentive to use it for maintaining the long-run capacity of farmland; for why should hard-pressed farmers, or governments, place great emphasis on conserving the capacity of farmland to produce outputs, if those outputs face artificially unfavorable and unstable world prices?

o Western governments have denied the international agricultural research system the resources it needs to improve sustainability of farming. For example, international crop research institutes want to examine the positive and negative effects of alternative fertilizer application practices on yields of tropical and sub-tropical soils over long periods, not just in a single season. But that needs much more land, labs and cash than does the standard single-season research. So does the vital task of increasing and preserving the diversity of high-yielding food varieties and plants, and of the environments where they grow well. Yet real resources for the Consultative Group on International Agricultural Research - which finances such crop research centers as the International Rice Research Institute in the Philippines, and the Wheat and Maize Research Institute in Mexico - have hardly risen for several years. It is high

time the West welcomed the Soviet Union as a partner here, playing its full part in supporting the costs of the international agricultural research system. Further, it is necessary to reverse the trend among some donors to "tie" their contributions to the fashions of the moment. This reduces core funding - which is essential for research institutions seeking to address the new conceptualizations needed to analyze and improve agricultural sustainability.

o We have allowed, perhaps encouraged or even indirectly compelled, international lending agencies to shift support away from agriculture and away from the poorest countries, and toward general-purpose loans for import support - i.e. in practice toward debt relief for richer developing countries, and indirectly for commercial banks in developed countries. The proportion of World Bank triennial disbursements (IBRD and IDA) for projects in agriculture and rural development fell steadily, from a peak level of 30 percent in the three years 1977-79, to only 17 percent in the extra years 1986-8. In real terms (constant dollars), disbursements for these projects fell by 23 percent of the peak level. Within such diminished totals, international support for agricultural credit programs, especially in Asia, is threatened by exaggerated objections against rural credit agencies that achieve inadequate financial cost recovery - even though the credit programs have usually offered excellent economic returns. Withdrawal of support for such credit programs not only cuts into resources for conserving farm environments, but further raises rural interest rates, so that farmers are further discouraged from "thinking long".

B. WHAT ARE SOME STRATEGIES TO RELIEVE POVERTY AND POPULATION PRESSURES ON THE ENVIRONMENT IN DEVELOPING COUNTRIES?

1. I shall look briefly at some leading "strategies to relieve poverty and population pressures", and then ask how each alternative might affect environmental stability. The main anti-poverty strategies that have been widely attempted are (a) public works, (b) food distribution, (c) creating or distributing assets for the poor. Each has successes and problems. The key to success is effective targeting on the poor. This requires incentives to scheme administrators to produce results - defined as households that become self-sufficient and escape from poverty, not as program money spent. Schemes that target themselves - by distributing coarse grains in areas known for high poverty incidence, for example - have usually succeeded better than schemes that rely upon administrators to decide who is poor, or how beneficiaries should use the gains from a program.

2. The World Bank has major experience with poverty reduction, some of it rather successful. This is being reviewed for the 1990 World Development Report. The Overseas Development Council has explored interactions between poverty reduction and environmental change. I shall say a few words about each of the three main anti-poverty strategies - public works, food distribution, asset distribution - with some reference to environmental effects in India, which has most experience of these schemes.

3. Public works programs have probably the best capacity to be used against environmental degradation. Irrigation and drainage

maintenance, including clearance of water-weeds from tanks and canals, is one example. We need to be sure that environmental protection components of public works programs are well conceived. Contour bunding, once popular in Western India, is now discredited.

o India's most celebrated anti-poverty program of public works is the State of Maharashtra's Employment Guarantee Scheme (EGS). This provides a guarantee of rural work in the slack season. The work is paid for at rather low piece-rates, but is guaranteed within about five miles of the home village.

o The EGS depends heavily on a big "shelf" of well-prepared works projects. As the shelf becomes barer, the scheme becomes more costly. Sustainability of anti-poverty programs is thus a financial issue, as well as an environmental one.

o However, most evaluations of the EGS are favorable. Especially in bad years, it provides several million persons per day with slack-season work. Women and lower castes benefit more than others, even proportionally to their numbers.

4. What about food distribution schemes? If they reach their targets - the undernourished poor, especially rural children in the most vulnerable age-group, aged six months to two years - there are good environmental side-effects. These poor households, if they become less desperate for want of income to buy food, are less likely to be driven to degrade marginal lands and common property, especially fuelwood. Extra food in such households can help solve the problem.

o However, general untargeted schemes (such as the programs of

two Indian State Governments, Andhra and Tamil Nadu, to feed all schoolchildren free) tend both to miss the poorest and to prove unsustainable fiscally.

o Carefully targeted programs, such as the World Bank-supported Tamil Nadu Integrated Nutrition Program, have proved considerably more successful.

o There is strong reason to believe that diarrheal infection is a more important cause of bad nutrition-health status, and of bad functional consequences, among the Third World's rural poor than simple lack of calories, though the two causes interact. In Narangwal, in the Indian Punjab, child health status was improved much more by $1000 divided equally between food supplementation and preventive child health care, than if spent entirely on either one or the other.

5. The classic example of attacking poverty by asset distribution is the redistribution of private ownership of land to the very poor. In Indian circumstances this usually raises output. With reasonable compensation, such programs are more acceptable - and have had more impact - in India and other developing countries than the conventional wisdom suggests. Land reform is likely to improve preservation of the soil-water environment, because it is associated with: less division of responsibility among landowner, hired worker and perhaps tenant or manager; more "direct supervision per acre" as the family entrepreneur replaces the big farmer; and more secure rights to land. Donor support could well be increased for carefully considered, compensatory schemes to redistribute private land rights.

Lacking such support, however, most Indian States have found such schemes too costly, financially and politically.

o The world's biggest program to create assets for the rural poor is India's "Integrated Rural Development Program". It is a misnomer, since the program seeks "only" to provide identified poor households with a productive non-land asset. Most often this is a milch cow or buffalo (stall-fed or on common grazing). Sometimes the asset is an artisan requirement such as a sewing machine. At least two-thirds of the money for the asset is loaned; the rest is a subsidy. The program has been convincingly criticized for diverting some funds to the non-poor; for glutting some local markets (e.g. for milk); and for weak technical preparation and managerial support. Yet the program's harshest critic agrees that it has pulled "only" 3 percent of poor rural Indians over the poverty line. I know of no discussion of the environmental impact of this vast program.

o Education and health programs can enhance the "human capital" of the poor (if there is a market in which they can sell their increased skills or capacity). When we look at the interaction between population, poverty and the environment, we should not look at "the environment" only in terms of the sustainable capacity of land to grow affordable food (or crops that can be sold to buy food). Most undernourished children are undernourished mainly because of repeated infections, reducing appetite and draining energy. Development programs need to be vetted for their effects on total food-health environment, not on food alone.

6. Clearly, strategies to reduce population growth - in humanly

acceptable ways - have major prospects for safeguarding environments, accelerating growth (by improving families' capacity to save), and reducing poverty (for the poor tend to have the largest families, and the most small children per adult). More female education, and more employment prospects for women in modern activities, are demonstrably effective ways of reducing voluntary fertility. Low-cost, readily available contraceptives also have a major role. Unfortunately, cost considerations have impelled many Third World governments, strapped for cash, to concentrate support for family planning on urban areas. Foreigners must be very careful not to interfere in population policies, but can help safeguard worldwide environments by offering direct support to Third World countries seeking to design and supplement acceptable programs of family planning, especially for marginal or overpopulated rural areas. In particular, governments of developed countries should support the UN Fund for Population Activities, which is currently denied US funding on the suspicion - I believe quite wrong - that it supports non-voluntary programs. It is hard to see how concern for environments in Africa, threatened with desertification or other results of overfarming, is consistent with neglect of population growth, now well above 4 percent a year in some of the countries at the greatest environmental risk.

C. WHAT ROLE CAN WOMEN AND CHILDREN PLAY IN IMPROVING THE DEVELOPMENT PROCESS, AND ITS SUSTAINABILITY

1. In almost all countries, women have worse prospects than men

for education, good jobs, and promotion. Because total prospects are worse in developing countries than elsewhere - fewer school places, fewer good jobs - men are especially keen to defend their privileges, and women's prospects are relatively much worse than in richer countries. This is obviously unjust. In extreme cases - and there is evidence of this in some villages of Northern India and Bangladesh - little girls die of malnutrition, while boys and adult men are given enough to eat. Discrimination against women is also extremely inefficient. Able women are kept out of universities and key jobs by not-so-able men.

2. But we must beware of "blaming the victims". Given their social circumstances, poor families must try to ensure their overall welfare - in extreme cases, their survival. If there are resources to put one child through high school, it will usually be a boy who is sent, because schooling will do more for his chances of a better income than would be the case for his sister. If food is short, the family will first see that the members likeliest be able to earn income and buy food - adult men - are fed enough to seek and complete paid jobs. Reducing poverty, helping the poorest to borrow for land purchase, proving more rural education of decent quality - all for children, women and men: these, not lecturing fathers about sexism, are the keys to full participation by women in the development process.

3. Work at the International Food Policy Research Institute (IFPRI) shows that extra income, in the hands of women, does a little more to improve children's health than in the hands of men. However,

we should avoid the "liquidity theory of income" - the notion that if Father gets more income he drinks it as alcohol, but if Mother does so she feeds it to children as breastmilk. This is simply a prejudice - sexism in reverse. In trying to accelerate and humanize the development process, reverse sexism is not the remedy for direct sexism; poverty reduction is.

4. Nor is there any serious evidence for the mystical view that women are somehow more pro-environmental than men - more in tune with nature and conservationist in their farming or other behavior. It is, however, clear that women are in some respects more vulnerable to the effects of resource degradation, because in most Third World rural societies it is women who are, literally, hewers of fuelwood and drawers of water. As intensive farming spreads away from the village lands, women must walk further and further, using ever more time and energy to obtain fuelwood and water. Studies in the hills of Nepal by Dr. Shubh Kumar, of IFPRI, have shown that this reduces women's capacity to supply labor to agriculture in the busy season.

5. Child labor in developing rural areas poses a severe dilemma. It seems cruel, inconsistent with education and development. Yet it meets the desperate need of poor families for income from labor-power - often their only asset. If child labor could be stopped by law (which is unlikely), the poorest would become poorer still, and more hard-pressed to go for immediate income at whatever environmental cost. But something can be done. In the short run, school terms should be timed to avoid clashes with agricultural peak seasons, and stringent controls should be enforced upon employers of child labor in

those activities (such as matchmaking and carpet weaving) where clear health hazards exist. Meanwhile, changes in agricultural technology and in poor people's access to income-earning assets (including land) are required, alongside improvements in the quality and usefulness of rural education. As these requirements are met, increasing enforcement of laws against child labor will become feasible and desirable.

D. HOW CAN TECHNOLOGY TRANSFER, EDUCATION, AND TRAINING INCREASE THE SUSTAINABILITY OF DEVELOPMENT PROGRAMS IN THE THIRD WORLD?

1. Western countries can do much for agricultural sustainability via technology transfer, by increasing the resources for international agricultural research, and by seeking new sources of finance for it (e.g. the Soviet Union). But other things that Western governments do - artificially pushing real rates of interest up, and farm commodity prices down - can undermine or reverse such contributions to sustainable agricultural progress in the Third World. Let me now be more specific about the scope and limits of "technology transfer, education and training" for these purposes.

2. Seeds and techniques can very rarely be transferred from temperate to tropical farmlands. Agricultural extension, however, can greatly speed up the process of transfer among tropical or sub-tropical farmers, provided that such farmers are in an agro-ecology, and face prices and markets, that make the recommended crops or seeds, inputs or methods, reasonably profitable and safe. An important and

largely neglected area is agricultural extension for migrants - often so-called "illegal squatters" - to new lands, to new marginal areas. Lacking extension, such migrants are prone to needlessly degenerate unfamiliar soils, and to conflict, often equally needlessly, with traditional (tribal) shifting cultivators.

3. However, a lot of resources have been wasted, or worse, in beefing up agricultural extension systems where there was nothing appropriate to extend. In such circumstances, the first requirement is for more research. Transfer of research techniques, support and planning from the international system can greatly accelerate progress in the Third World. Both in agricultural extension and in research, Western countries can help to increase outputs and improve sustainability. These appear ideal areas for aid, because the returns are high but long-run - it takes 5 to 15 years of design and testing between initiation and delivery of research for a typical improved cereal variety. In Asia and Latin America, major gains in food production have been achieved through the interaction of national agricultural research systems, the international research centers, and funding and planning support from Western countries. I shall say a little about sustainable impacts and options later. But first a word of caution is needed.

5. In Africa, only a small number of countries - including Zimbabwe, Malawi, Botswana, and Kenya - have enjoyed governments willing to steer domestic cash towards agricultural research, and to provide working conditions that train, pay and encourage scientists to stay in the national research system. Without firm government

commitments in these matters, foreign support to national agricultural research is like pushing on a piece of string. And without sound national agricultural research systems, the products of the international system usually cannot be spread - certainly not quickly or safely. New varieties of cereals, for example, can be taken over from an international center, but need to be adapted to local conditions, and protected against new, often localized, biotypes of pest and disease. Donors should provide capital and technical support for national agricultural research generously to developing countries - but only to those willing consistently to back such research with national commitments of current domestic cash, people, and training.

6. If such requirements are met, there are several areas in which technology transfer and training in agricultural research can increase sustainability. I shall concentrate first on a couple of types where new work is required, to generate something useful to transfer.

o The most important area probably concerns assistance to maintain the genetic diversity of varieties and cropping systems. New dwarfing genes, especially for rice - and more work (including basic research) on how to breed in horizontal resistance or tolerance to pests and diseases, instead of relying on single-gene resistance - are important areas of work.

o Where rapid population growth is inducing a shift towards settled agriculture, or is shortening fallows, better use of nutrients and water is necessary to prevent degradation. In fragile soils (such as many in semi-humid parts of Africa), and in conditions

of moisture stress of uncertain severity and timing, there are big knowledge gaps. As for nutrients, simply piling on inorganic fertilizers will not help much in porous soils with little organic matter. As for water, trying to make West African rice lowlands perform like Asian paddies - so-called "swamp development" - has proved unsustainable, because too little is known about swamp hydrology. In the medium term, Africa certainly cannot handle its burgeoning populations without much more irrigation - preferably managed by small farmers and not remote officials - plus much more fertilizers. But more knowledge, and the local capacity to apply it, are needed first, if the agricultures created are to be sustainable.

6. In the overlap between training and technology transfer, there are several areas where new techniques are being spread to smallholders too fast - faster than knowledge of how to use them well. This sometimes poses severe environmental threats. For example, pesticides are often used in excessive doses. In Andhra Pradesh, India, I met farmers who were using EDB on stored rice at several dozen times the recommended rate. Clear, pictorial guidance - on each of the small packages of pesticides that smallholders buy - would reduce the threat to the food chain.

7. An overriding threat to soil and water resources in the Third World comes from the steady intensification of farming on marginal lands. There are two ways to handle this (until agricultural populations stop growing). The first way is more inputs, incentives and research on the most intensively farmed lands - the Punjabs and the Sonoras of the world. The second way is to develop crop-mixes and

rotations, erosion control methods, and micro-irrigation that can be profitable even on marginal lands. There is no universal "right answer"; but crop scientists, like other people, tend to try to do again what they have done successfully before. This leads, perhaps, to underemphasis on soil-water-crop conditions that have long been neglected and have therefore come to be regarded as unpromising.

8. Finally, whether intensive or marginal cultivation is emphasized, we all - in rich and poor countries; in education, research, or technology transfer - need to recall a central issue. What needs to be "sustainable" is not a particular form of farming, nor a particular use of this or that piece of land. What has to be sustained is the capacity of people, countries, and the world to support decent livelihoods. An important implication of this becomes clear when we consider that a growing majority of the world's poor derive their sustenance, not from farming their own land, but from working for other farmers as employees. How are their livelihoods, and the soil and water that support them, to be sustained? Patterns of farming that are labor-intensive yet resource-sparing need to be extended, transferred, or (sometimes) invented. Examples are: the placing of slow-release or mudball fertilizers in the root zone, using more labor but increasing the productivity of small amounts of nutrient and thus substituting employment for chemicals; and intensive management (e.g. via cross-bunding) of irrigation and drainage, substituting employment for water. Such inputs as tractors, threshers, and weedicides - which substitute cash purchases for employment, and at the same time may require more skillful management

to sustain the environment - are sometimes desirable in Third World agricultures. But, if our perspective is that of sustainable livelihoods, there is always a strong presumption against any subsidy to such inputs, or to research into them.

Representative SCHEUER. Thank you very much, Mr. Lipton.

I quite agree with you that we have to find labor-intensive ways of coping with environmental degradation. It is obvious that there isn't enough capital in the developed world to make that available to the developing world. In fact, too often, what aid has been proffered by the developed world and by the international banks, the kind of aid that has been offered has been capital-intensive projects that are labor saving, and what the developing world needs are labor-intensive projects that are capital saving. So I agree with that thrust of your statement.

All right. Now we'll hear from Mr. Walter Reid, associate of the World Resources Institute. We are delighted to have you, Mr. Reid.

STATEMENT OF WALTER V. REID, ASSOCIATE, PROGRAM IN FORESTS AND BIODIVERSITY, WORLD RESOURCES INSTITUTE

Mr. REID. Thank you, Congressman. It is a pleasure to be here.

The record of Third World development provides lots of examples of what not to do if you want to achieve sustainable development, but it is much harder to find examples of success. In my testimony today, I will discuss some of the insights that can be obtained from examples of successful sustainable development projects. The testimony is based on projects that are identified as successful by a diverse group of about 20 nongovernmental organizations in eight different countries representing networks throughout the developing world. Few of the examples that we looked at in this project had economic evaluations detailing their economic sustainability, but almost without exception, the success and sustainability of these projects was readily apparent, and I think this gets at an issue that you have been struggling with in these hearings. It may be hard to find an operational definition of sustainable development, but you know it when you see it.

Sustainability can be seen in the elevation of crop yields without the use of expensive inputs or subsidies. It can be seen in continued use of new technologies or institutions after the project staff and extension agents leave. It can be seen in the spontaneous adopting of new technologies by adjacent communities, and perhaps most importantly, it can be seen in the maintenance of productivity of the natural resource base and particularly the biological diversity of regions where sustainable development projects are put into place.

There are basically three points I wanted to make this morning in my testimony, two of which are particular to whether or not projects succeed: the issues involved and the characteristics that allow them to succeed. But the first is a little bit more general and that's that sustainable development in the Third World depends not on scattered successful projects but rather on fundamental changes in national policies to those that will foster the adoption of sustainable technology.

I think many development successes have occurred because project staff have been able to circumvent aspects of the national policies that hinder sustainable development. There are four important steps that the United States can take toward the goal of en-

suring that national policies will encourage sustainable development.

First, the United States should rationalize economic incentives within our own country in the areas of forest, energy, and agricultural policy to ensure that our own use of resources is sustainable.

I would like to commend you, Congressman, for your own efforts in this regard, first, as the prime sponsor of H.R. 1268, the National Biodiversity Conservation Act. The conservation of biodiversity, whether or not we can keep the essential components of our biological systems around, is perhaps the ultimate measure of success in sustainable development. Second, for your cosponsorship of the Tongass Timber Reform Act, H.R. 987. The subsidation of the excessive timber harvests in the Tongass forest, more than any other activity going on in the United States right now opens us all to the charge of hypocrisy, when we argue that other countries should rationalize their own forest policies.

Second, the United States should encourage the U.N. Statistical Commission to incorporate the depreciations of natural assets in their calculations of national income accounts. Since most countries use the U.N. model, this action would lead to reforms in both developing and developed nations.

Third, the United States should continue to pressure the MDB's and the IMF to design structural adjustment loans with strict consideration given to their effects on natural resources.

Fourth, the United States should support initiatives by AID to press for policy reforms within sectors such as forestry, energy, agriculture, and for reform in land tenure that would establish appropriate incentives for sustainable resource use.

There are many attributes shared by successful sustainable development projects, but I will focus only on the two that I consider to be most fundamental in the examples we looked at.

First, success requires a pluralistic process in the identification, design, and subsequent implementation of projects. Planners have often ignored the sources of information that are best able to advise them on the design and implementation of rural development projects. These are local people and concerned NGO's. Projects not tailored to fit the needs of people and the constraints of local environment have little chance of success. Those implemented without grassroots support in the long run have generally failed. Local participation ensures that successful projects will become institutionalized and it contributes to initial success by ensuring that the projects address people's real needs.

I think that the MDB's and the bilateral AID agencies have taken steps to increase participation by local people, but still this participation occurs far too late in the project cycle when substantive decisions have already been made. All too often, at that point in the project cycle the only option available to individuals concerned about the project is to try to obstruct it, whereas, if they were incorporated earlier in the project cycle, they would be able to add constructive input.

The United States, through the activities of AID and through its influence on the policies of the MDB's should continue to stress the importance of working more closely with groups in developing

countries representing local populations that are working together to conserve resources and land.

Representative SCHEUER. Excuse me, Mr. Reid. Would you also include the performance of their working with women, enhancing the role of women in development?

Mr. REID. Definitely, yes. I think there is a variety of groups that have been left out of this process. I think the list could go on and on, but certainly, women would be one appropriate group. NGO's that are directly involved in direct development projects, the private sector groups within countries, universities, a variety of different institutions, can provide important insights to these processes. They should all be included.

Representative SCHEUER. We had a witness in one of the other hearings, I forget which, who referred to the typical Third World farmer and her husband.

Mr. REID. That's very appropriate.

Representative SCHEUER. That got our attention. We enjoyed that. But that was saying something very real. If women do most of the farming, it is estimated that they do between 75 and 80 percent or more of the farming. That means that all kinds of policies aimed at enhancing the effectiveness of the Third World farmer ought to be rethought through and directed at women and made appropriate and intelligible to women, and this critical role of the women ought to be redefined and enhance the farmer's effectiveness, because the typical Third World farmer is a woman.

Mr. REID. There is one difficulty associated with actually putting the contribution of women into use in some countries, that their role in society places them in a position where they don't generally take the initiative to contribute to discussions about resource use. For example, in Africa, in the town of Kutheka in Kenya, there is a project organized through WRI called the From the Gound Up Project, that is looking at an example of success where some 15 local groups have been involved in local resource conservation activities, building barriers to erosion and establishing schools, and they are primarily women's groups, in fact, almost exclusively women's groups. The From the Gound Up Project went to this community to try to understand what were the attributes that led to the success in this area and to share those ideas with other communities.

The initial problem that they encountered was that the men were the only ones that wanted to talk to the researchers. The women felt that it was not their role to do that, so what the project developed was a participatory research process that brought the women into this so that the project team could start getting the insights from the women into what was actually going on. It served to provide hints to other communities as to what they could do to foster this grassroots development, and it also allowed the city itself to identify their own needs.

Representative SCHEUER. You went right to my central nervous system when you talked about the degree to which women have knowledge but not the ability to impact policies and programs. I think that ought to be a key role for AID to play, giving women an effective voice in determining policies, programs, sound environmental and conservation and sustainability practices.

Mr. REID. I think that is a real key. But we don't want to enter into this with the idea that we want to change cultural traditions. What we do want to do is enter into it with the idea that we want to empower women within these communities, so that if within the community the cultural traditions are to be changed, the women have the power base to do it. So we shouldn't be coming up with our own solutions in terms of——

Representative SCHEUER. I quite agree to that. That would be totally unacceptable. That would just get a lot of backs up, but we ought to devise ways that some of that cultural baggage can retreat under the moral imperatives of the conditions that we face today, conditions that young couples face. For example, Mr. Lipton, and I don't want to get into an extensive discussion, mentioned that population increase is caused by the driving causes of poverty; right? Well, it's caused by more than that. Part of it is caused by the fact that a man proves his macho and proves his manhood by fathering a child every year. He may not be able to feed, he may not be able to clothe him, he may not be able to send him to school, but he proves his macho by fathering a child every year. That is cultural baggage that is really deleterious to any concept of sustainable development, any concept of viewing the long term as a legitimate priority.

That's what this Wall Street Journal article about the Amazon, about Rondonia, is all about. I quote Silvio Rodriques Persio Cunha, Secretary of Planning in the western Amazonian State of Rondonia: "For many people here, deforestation equals survival." That comes from population pressures. It comes from too many people who can't find jobs in urban communities who search willy-nilly to scratch out a bad living on this land that underlies these glorious tropical forests. Once you knock down the forests, that land isn't worth a heck of a lot. You can farm it a couple of years, you can raise cattle for a couple of years, but that land whose highest and best use was supporting a tropical forest pretty soon collapses and it only provides a living for a couple of years and then the farmer has to move on and engage in some more slash-and-burn agriculture.

Mr. LIPTON. The Indian State of Kerala has brought down the number of children that women have, so that they're just replacing themselves. Population growth is down to pretty nearly zero. In India, as a whole, it is over 2 percent. That isn't because the men in Kerala are any less macho than the men anywhere else in India, it is because the opportunities for work and survival are such they don't feel that they must have large numbers of children in order to ensure a surviving son, and I say, son, to support them in adulthood. Conditions have changed. And fertility has come right down. There are many other examples.

Representative SCHEUER. It is also due to the fact that they have an extremely talented and gifted Governor of the State of Kerala, who happens to be a Communist, I regret to say. [Laughter.] Who introduced an excellent education system, and little girls get educated and they get job training, and they are taught to want to engage in that great big world out there. And that has had a fruitful identifiable impact on population increases, and those girls, those young women who get an education and who get job training,

have a whole different view of themselves. That is a model. The State of Kerala is a model that should be looked at all over India and, indeed, all over the developing world. You really put your finger on it.

I really apologize to all of you for getting into this discussion prematurely, but you hit me in the central nervous system, Mr. Reid. Please proceed. All of this was on my time, not on yours. [Laughter.]

Mr. REID. My final point involves flexibility of project implementation. Project success requires flexibility, specifically project implementation must adapt to the specific local environmental and social circumstances. This is particularly true with respect to projects in marginal lands. Where large, centrally planned projects may succeed, is in high potential areas where soil fertility is high and farming conditions, rainfall, access to irrigation are well suited to agriculture. However, under the more difficult ecological conditions found in marginal lands, projects can only succeed if they are flexible enough to allow this local adaptation.

A prerequisite for flexibility is feedback regarding how the project is actually being undertaken and what the effects are on the environment. NGO's can play a critical role in providing this feedback, if they are given access to information during project implementation and design.

In addition, environmental staffs of development agencies and banks must have sufficient capacity to review projects for potential flaws and reorient them in environmentally sustainable directions.

Both the World Bank and the AID have taken steps to enhance their environmental units; however, they remain understaffed in the regional units which actually review projects.

Representative SCHEUER. Mr. Reid, let me tell you that the president of the World Bank, Barber Conable, gave a speech at the World Resources Institute about a week ago. Were you there, Mr. Reid?

Mr. REID. No, I was not.

Representative SCHEUER. He indicated that they were going to move into income accounts that reflected environmental costs.

Mr. REID. That is very important. The U.N. should do that as well, the U.N. Statistical Commission. If the Bank adopts it, it is going to put a great deal of pressure on the U.N.

Representative SCHEUER. Yes, they are going to move into including resource depletion in the national accounting framework, in their project accounting framework, and they are moving into it. It will take a great deal of time, but he anticipated that within 3 to 5 years, it would be throughout, as a given, that that would be included in the costs and benefits of that project, as an increase in cost and a reduction in benefits, and that would be included in all our bank accounting for development projects. I think that is a marvelous leap forward.

Mr. REID. That is encouraging.

Regarding the question of environmental staff, the World Bank is far ahead of the other multilateral banks in terms of actual environmental staff. For example, both the African Development Bank and the Asian Development Bank have environmental staffs of only three individuals, whereas the Bank, as you know, 2 years ago

increased its staff to over 60, I believe. So there should be quite a bit of pressure put on the other MDB's to try and increase environmental staff in these regional units that review projects.

The importance of flexibility in project implementation and the ability to respond to local needs and local conditions explains in large part why examples of success, particularly on marginal lands, tend to be relatively small in scale. The MDB's and bilaterals undertake projects on a scale that generally prevents this local adaptation to circumstances in the community and the environment, whereas NGO's frequently take small projects that can be modified to match specific community and environmental needs. There are examples of how one can scale up projects to take advantage of some of the attributes of small projects. An example is provided by an AID project in Haiti, where they made use of an intermediary NGO that served as the umbrella for some 170 smaller NGO's in both the United States and Haiti. This served to make sure that the smaller NGO's didn't have to deal with bureaucratic requirements of AID yet still allowed for that local adaptation to needs. It was one of the first examples of a forest restoration project in Haiti that was actually successful.

But while it is important to look for means whereby projects can be scaled up, we must also recognize the inherent advantages of small projects. A much greater percentage of AID money should be channeled through private voluntary organizations (PVO's), requirements for matching funds should be eased. Moreover, support for Federal institutions like the Inter-American Foundation and the African Development Foundation, which operate at this small-scale, grassroots level, should be enhanced.

In conclusion, I think the inclusion of locally affected people and knowledgeable NGO's in the planning process may be the single most important element for success in development. With a pluralistic process, will come responsiveness to people's needs, the enhancement of the capacity for local institutions to undertake development and land-use planning on their own, and the monitoring and feedback necessary to ensure project success.

Moreover, with the pluralistic process also comes self-reliant community development that provides the political and institutional stability necessary to ensure long-term sustainability.

Thank you again for asking me to testify.

[The prepared statement of Mr. Reid, together with attachments, follows:]

PREPARED STATEMENT OF WALTER V. REID

Mr. Chairman and members of the subcommittee, I am Walt Reid, Associate in the Program in Forests and Biodiversity of the World Resources Institute. WRI is a research and policy analysis group, established in 1982 to develop and assess policy options on environmental and development issues. I thank you for the opportunity to testify before this subcommittee on the topic of "New Strategies and Successful Examples for Sustainable Development in the Third World."

The obstacles in the path of sustainable development -- in both industrial and developing nations -- are serious, and they are growing rapidly. Population growth in the developing world, and high levels of *per capita* resource consumption in developed nations, are overwhelming patterns of resource use that, with fewer people and lower *per capita* consumption, would otherwise be sustainable. In the face of the combined pressures of population growth, international debt, and increasing poverty, the necessity of placing our use of the world's resources on a sustainable footing is evident, but equally apparent is the magnitude of the challenge we face in achieving this end.

The record of Third World development provides many lessons of what *not* to do if we hope to foster the establishment of sustainable patterns of resource use. But it is much harder to find lessons of success indicating what we should be doing instead. In my testimony today, I will discuss some of the insights that can be gained from examining successful development projects. Examples of success demonstrate the reality of sustainable development and indicate the approaches that are most likely to succeed in achieving this goal.

The examples that I will discuss were identified as successful by a diverse group of some 20 non-governmental organizations (NGOs) in 8 countries involved in environment and development issues.[1] Several of these organizations represent networks of NGOs with representatives in almost all developing countries. While few of the examples of successful projects have received detailed economic evaluations, the success and sustainability of the projects is generally readily apparent. Sustainability can be seen in the elevation of crop yields without the use of expensive inputs or subsidies; the continued use of new technologies or institutions after the project staff or extension agents leave; spontaneous adoption of the new approaches by surrounding communities; and, by the maintenance of the productivity of the natural resource base of forests, soils, coastal zones, water and biological diversity. I will only briefly describe projects in my oral testimony but I include more detailed descriptions of these and other projects in the annex to my statement, which I ask to have included in the record of this hearing.

Policy Reform

Development projects that succeed often do so *in spite of* policies that stifle sustainable development, and their success can often be attributed to innovative methods of circumventing economic, land tenure, and other policy constraints. The impact of such policy constraints can be seen in the example of the Majjia Valley, an important agricultural region in central Niger, where population growth had led to the almost complete deforestation of the valley by the early 1970's.

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1. Reid, W.V., J.N. Barnes, B. Blackwelder. 1988. *Bankrolling Successes: A Portfolio of Sustainable Development Projects.* National Wildlife Federation and Environmental Policy Institute, Washington, D.C.

Severe wind erosion from the loss of the tree cover was depressing soil fertility and the wind-blown sediment was often covering emerging plants, forcing farmers to reseed the fields. In 1975, CARE began a project to control erosion by planting windbreaks, but the success of the project was hindered by a national policy that gave ownership of the trees to the government. With little incentive for farmers to plant or care for the trees, the initial years of the project achieved only limited success, and for the first few years the trees had to be protected by paid guards. Recently, however, the government granted the rights to the trees to the farmers and as a consequence the rate of windbreak establishment has increased. Studies of crop yields have found a net increase of 15-23 percent resulting from the windbreaks. Moreover, the obvious beneficial effect of the windbreaks -- particularly as a source of cash income from the sale of wood -- has encouraged many farmers to start their own nurseries.

The initial years of the Majjia Valley project provide one of many examples of perverse incentives that hinder the adoption of sustainable technologies. People without secure tenure to their land are unlikely to make the investments in soil conservation or agroforestry that would be needed to sustain the productivity of the land. Heavily subsidized pesticide use discourages the adoption of integrated pest management technologies. The failure of governments to consider the loss of their forest resources to be the loss of a crucial economic asset, encourages unsustainable forest exploitation for short-term profits. While the remainder of my testimony will focus at the level of the individual project, it should be stressed that real development in the Third World depends not on scattered successful "projects" but on fundamental changes in national policies to those which will foster the adoption of sustainable technologies. Three important steps that the U.S. can take toward this goal are:

(a) **Rationalize economic incentives within the U.S. itself, in the areas of forest, energy, and agricultural policy, to ensure that our own use of resources is sustainable;**

(b) **Encourage the U.N. Statistical Commission to incorporate the depreciation of natural assets in their calculations of national income accounts.** Since most countries use

the U.N. model, this action would lead to reforms in both developed and developing nations;

(c) Continue to pressure the multilateral development banks (MDBs) and the International Monetary Fund to design structural adjustment loans with strict consideration given to their effects on natural resources; and,

(d) Support initiatives by U.S. AID to press for policy reforms within sectors such as forestry, energy and agriculture and for reform in land tenure that will establish the appropriate incentives for sustainable resource utilization.

Turning now to specific projects, there are many attributes of successful projects that could be listed, but I will reduce this list to only two items which are basic features common to almost all successful projects, and which I see to be the central issues that must be addressed in attempts to widen the impact of successful development projects.

- First, ***success requires a pluralistic process in the identification, design and subsequent implementation of projects.***

- Second, ***success requires flexibility; specifically, project implementation must adapt to the specific local environmental and social circumstances.***

Participation

Development planners have often ignored the best sources of information on the design and implementation of rural development projects: local people and concerned NGOs. Projects not tailored to fit the needs of the people and the constraints of the local environment have little chance of success. Those implemented without grassroots support may achieve short-term goals, but in the long run they generally fail. Local participation ensures that successful projects will become institutionalized, and it contributes to initial success by making sure that the projects address

people's real needs. Many projects have foundered because they have tried to solve problems that were critical in the minds of planners only -- but not to local people. Examples of the success that can be achieved through processes that ensure public participation in planning include:

o In northern India, overgrazing in the watershed near the village of Sukhomajri had left the hillsides almost barren of vegetation and subject to severe erosion. Several efforts by the government to stem the erosion failed; construction of check dams provided only temporary help because they were not maintained by the residents and grazing continued unabated. In 1975, an attempt was made to directly involve the villagers in the watershed restoration project. Three small dams were built and the water was given to the villagers for irrigation. This improved crop yields dramatically and, after a series of community meetings, the villagers agreed to give up their grazing rights in the hills in return for water for irrigation. Reduced erosion and moister soil has substantially increased grass growth on the surrounding hillsides. Cattle can now be fed more than they obtained when free to graze. Daily village milk sales have increased ninefold, and average annual crop yields have risen 400 to 500 percent. Sediment loss from the watershed has plummeted from 150 tons to 10 tons a hectare per year.

o In 1981, World Neighbors, with support from the Honduran Ministry of Natural Resources and a private Honduran group, began an agriculture development program in the Guinope area of Honduras in an effort to end the cycle of declining productivity. The program was oriented toward simple technologies that could stem erosion and restore land fertility. The project brought individuals who were already utilizing soil conservation practices elsewhere in Central America to Guinope to train volunteer farmers in the use of the techniques. The farms of the volunteers served as pilot projects demonstrating the techniques and the farmers themselves then became the extension agents in the Guinope region. In the first year, the yields of maize of farmers adopting the techniques tripled or quadrupled -- from 400 kilograms per hectare to 1,200 to 1,600 kilograms. In the next five years, 40 other villages requested training in the soil conservation practices. This success was achieved with no subsidies or donations; all costs of the agricultural production were carried by the farmer. With the spread of the program into other villages, the benefits now cover

an area stretching from the Nicaraguan border, halfway to Tegucigalpa.

o One of the most promising recent demonstrations of the value of local participation in development planning is provided by the "extractive reserve" concept in Brazil. Until recently, plans for the development of the Amazon largely ignored the fate of those already living there. Along with indigenous peoples some 500,000 rubber tappers live in the Amazon. Since the mid-1970s, conflicts between rubber tappers and cattle ranchers have been frequent. The tappers, already somewhat organized from the years under the domination of the rubber barons, strongly resisted the advancing deforestation of the Amazon, primarily through non-violent demonstrations. In October 1985, 120 leaders of the rubber tappers met in Brasília to discuss their common interests and goals, and first articulated the idea of extractive reserves. Four extractive reserves have now been established in the Amazon region. Communities can be granted a long-term (up to 30 years), renewable contract for use of the land. Clear-cutting is prohibited but plots of land can be cleared for subsistence agriculture. Extractive uses of the Amazon have proved to be sustainable and provide a model for the compatible roles of development and conservation. Reserves provide direct economic benefits to the rubber tappers, undisturbed land for indigenous people, and invaluable protection for biological diversity. Over a 10-year period, the net present value of extractive reserves appears to be slightly lower than that of either cattle ranching or agriculture. But because neither ranching nor agriculture can be sustained in these parts of the Amazon, the present value over 15 to 20 years favors extractive use of the forest.

The public who should be involved in project planning, implementation, and monitoring extends beyond the communities immediately affected by development projects. Private Voluntary Organizations (PVOs), NGOs, farmers' organizations, cooperatives, schools, universities, and private entrepreneurs all constitute unique sources of information useful during planning and implementation. While most donors have taken some steps to increase participation, the participation still occurs far to late in the project cycle when all substantive decisions have already been made. The U.S., through the activities of the Agency for International Development (AID) and through its influence on the policies of the MDBs, should continue to stress the importance

of working more closely and systematically with groups in developing countries representing local populations that are working to conserve resources and land.

Flexibility

The second recurring theme in examples of successful development projects is flexibility: the ability to adapt projects to the local environmental and social conditions. This is particularly true with respect to projects in marginal lands. Where large, centrally planned projects may succeed is in high potential areas where soil fertility is high, and farming conditions, rainfall, or access to irrigation are well suited to agriculture. However, under the more difficult ecological conditions found in marginal lands, projects can only succeed if they are flexible enough in allow this local adaptation. Project design must be a continual, interactive process during implementation. Large projects can significantly affect the lives of tremendous numbers of people in developing countries. But it is difficult for large projects to match specific local conditions or for them to change in response to information gained during project implementation. Small development projects, often implemented by PVOs, tend to be more successful because they are flexible and have the potential for direct interaction with local conditions and people.

[illegible] one U.S. AID project in Peru, the Central Selva Project, completely reoriented [illegible] in the original concept were revealed, and it was transformed from a sure [illegible] a pilot project that may aid development throughout Latin America. Although the project has been suspended due to political problems in that region of Peru, it still provides a useful example of the potentials for sustainable development. The project was originally proposed by Peru with the emphasis on the routing of a main highway, the Carretera Marginal de la Selva, through the valley to open the basin to agriculture and development. The project largely ignored the fate of native people living in the region as well as settlers who had established landholdings in the area over the past century.

The initial design assumed that the land would be suitable for agriculture. Instead, the land-use potential was limited to forestry by the area's heavy rainfall; by erodible, acidic, and

infertile soils with aluminum toxicity; and by steep terrain. Faced with strong opposition of local groups, and after reviewing information from field studies on the agricultural potential for the area, U.S. AID revised the project concept to emphasize sustained production through appropriate land use, particularly in the area of natural forest management. The project also shifted from its emphasis on medium- and high-input agriculture when it became apparent that low-input agriculture was better suited to the needs of the people in the region.

A second example of success that can be attributed to the flexibility of project implementation is provided by one of the relatively few successful "fuel-efficient stove" projects: the Kenya "jiko" charcoal stove. The project's initial goal was to manufacture and sell 5,000 improved charcoal stoves by 1985. In fact, 13,000 stoves were sold by the end of the first full year of operation, and by mid-1986 the new industry was well institutionalized and 125,000 stoves had been purchased. It is estimated that the new industry had captured 10 percent of the traditional jiko market in just the first few years of operation. Nationwide, annual savings in fuel amount to 1.5 million tons of wood, worth approximately $2 million per year. A key to the success of the project was a decision to test the acceptance of several models of prototype stoves in a pilot project. In 1983, two prototype stoves were tested in 450 households in Nairobi and Mombasa. The researchers worked closely with metal and ceramic artisans to develop a durable product that could be standardized and manufactured easily. Information from both producers and users was then integrated into the final stove design.

Groups in developing countries representing local people can provide an invaluable service to project planners by monitoring project implementation and identifying necessary changes. This monitoring is essential in adapting projects to local conditions. In addition, the environmental staff of development agencies and banks must have sufficient capacity to review projects for potential flaws and reorient them in environmentally sustainable directions. Both the World Bank and U.S. AID have taken steps to enhance their environmental units; however, they remain understaffed in the regional units which actually review projects. The other multilateral banks have only skeletal environmental units. Both the Inter-American Development Bank and the Asian Development Bank,

for example, have professional environmental staffs of only 3 individuals. **The U.S. should press for greater environmental review of development projects early in the project pipeline, and for the enlargement of professional environmental staff particularly in the regional MDBs.**

Questions of Scale

The necessity of flexibility to respond to local needs and local conditions explains in large part the fact that most successful rural development projects are relatively small in scale. The MDBs and bilateral aid agencies undertake projects on a scale that generally prevents adaptive response to local conditions. PVOs such as CARE, World Neighbors, and others undertake small projects that can be modified to match specific community needs. Particularly in marginal lands, several PVO projects, especially recent agroforestry efforts, have been strikingly successful whereas MDB and bilateral aid projects, which potentially could improve the well-being of a significant number of people, have been strikingly unsuccessful.

Faced with the difference in the success of small and large projects, the natural inclination is to attempt to "scale-up" the small projects while retaining their beneficial attributes. One example of the potential for doing just this is provided by the Haiti Agroforestry Outreach Project of U.S. AID. In the past 40 years, the forest cover of Haiti has been reduced by 90 percent. In 1981, AID funded the Agroforestry Outreach Project to promote trees as a cash crop and thereby aid the reforestation of the country. The project design grew directly from lessons of the limited successes and the failures of 19 previous erosion control projects in Haiti. Funds for the project were distributed to three private groups, one of which, the Pan American Development Foundation, acted as an umbrella organization for more than 170 smaller Haitian and U.S. NGOs. By using this intermediary NGO, AID avoided the added administrative costs of dealing with many small NGOs, while the small organizations avoided the bureaucratic requirements of loan and grant recipients. The project itself benefited from the capacity of smaller institutions to adapt to the specific needs of the environment and people. By 1986, 39 tree nurseries were in operation, producing more than 5 million seedlings per year. Approximately 110,000 farmers had planted more than 25 million seedlings, with a 50 percent seedling survival rate. The cost per surviving

tree was less than a quarter of planner's original estimates.

But while it is important to look for means by which projects can be "scaled-up," we must also recognize the inherent advantages of small projects. **A much greater percentage of aid money should be channeled through PVOs and requirements for matching funds should be eased. Moreover, support for federal institutions such as the Inter-American Foundation and the African Development Foundation which operate at this small-scale, grassroots level should be enhanced.**

One effort that is making use of this inherent advantage of small projects is the "From the Ground Up" project, a collaborative effort of institutions in Africa, Europe and the U.S., initiated and coordinated by WRI's Center for International Development and Environment. The goal of the project is to increase the capacity of local communities and of international institutions to foster sustainable development by using improved tools for grass-roots research and better communication and training techniques. The program first identifies successes in resource management. For example in the town of Katheka, Kenya, 15 volunteer groups, primarily women's groups, have been working for 10 years to construct bench terraces, plant grass, and develop check dams to slow erosion, and have opened several schools, churches, wells, and water pumps. The village groups have raised almost all of the money for this work themselves, designed the projects, and contributed virtually all of the necessary labor. Through the use of a participatory research process in the local community, the From the Ground Up program has analyzed the factors contributing to this success. This program has assisted the people within the community in identifying the means of responding to their most pressing needs. It has also helped identify the core elements of effective, local managerial and technological approaches that may be adapted to other communities in Africa.

Conclusions

Planners have long ignored the importance of including locally affected people and knowledgeable NGOs in the planning process. This may be the single most important element for success in development. With a pluralistic process will come responsiveness to people's needs, the

enhancement of the capacity of local institutions to undertake development and land-use planning, and the monitoring and feedback necessary to ensure project success. Moreover, with a pluralistic process also comes self-reliant community development that provides the political and institutional stability necessary for long-term sustainability.

Mr. Chairman, I thank you again for the opportunity to testify and I congratulate this subcommittee for its leadership in attempting to identify the new approaches to development that will be needed to ensure that our use of the world's resources is placed on a sustainable footing.

Annex

SUCCESSFUL SUSTAINABLE DEVELOPMENT PROJECTS[2]

2. Reid, W.V., J.N. Barnes, B. Blackwelder. 1988. *Bankrolling Successes: A Portfolio of Sustainable Development Projects*. National Wildlife Federation and Environmental Policy Institute, Washington, D.C.

Majjia Valley Windbreaks

The Majjia Valley, an important agricultural region in central Niger, is located in the southern Sahel, an area with low (400 to 600 millimeters a year) and variable rainfall. Farmers grow millet and sorghum in the rainy season of May to September. In the dry season, some fields are irrigated with water from hand-dug wells and planted with watermelon, cowpeas, cotton, tobacco, and tomatoes.

At the beginning of the nineteenth century, the valley was heavily wooded. But the growing population--with a relentless need for fuelwood, fodder, and construction materials--overharvested the natural vegetation. By the drought years of the early 1970s, Majjia Valley began to experience severe problems. Wind erosion now removes nearly 20 tons of topsoil per hectare annually from fields. This alarming rate contrasts with typical agricultural erosion losses of 0.5 to 2.0 tons per hectare a year. In the rainy season, wind-blown sediment often covers emerging plants, forcing farmers to reseed the fields.

In 1975, CARE began a project to control erosion by planting windbreaks. By 1987, some 560 kilometers of windbreaks, consisting of double rows of an Asian evergreen, neem (Azadirachta indica), had been planted and over 3,000 hectares of cropland had been protected. The trees cut wind velocity near the ground by 45 to 80 percent, resulting in less soil erosion and more soil moisture. One study of crop yields found a net increase of 15 percent, and another noted jumps of 18 to 23 percent, even after accounting for the land taken out of production by the tree lines. In 1984, the first trees planted were cut, and the wood was distributed to residents for fuelwood and construction.

The Majjia Valley windbreak project literally blocked the further development of serious erosion, deforestation, and desertification problems. The higher millet and sorghum yields provided immediate benefits to the farmers, who are now also receiving the delayed benefits of increased wood production. From the beginning, the project appeared to be ecologically sustainable. But its social and political sustainability was less clear. Although it was initiated at the request of the valley's farmers, they played only a minor role in project planning and their initial participation was modest. Farmers were not involved in raising seedlings, nor did they have rights to the trees planted on their land. The trees belonged to the government of Niger. During the first three to four dry seasons they were protected by paid guards.

The government recently granted the rights to the trees to the farmers and the local village development councils. Moreover, the obvious beneficial effect of the windbreaks--particularly as a source of cash income from the sale of wood--has encouraged some farmers to start their own nurseries. Currently 129 private nurseries are being tended. Farmers have exclusive rights to all the seedlings from these plantings and to nearly half the seedlings from the government-operated nurseries. The long-term success of the project may be aided by the eventual spread of the woodlots and nurseries into private control.

Sukhomajri Watershed Restoration

The Shiwaliks, foothills of the Himalayas in northern India, were heavily forested until the mid-1800s. Resettlement efforts, encouraged by the British, boosted the population density. By the end of the century, most of the forest had been cleared for agriculture and grazing. Serious problems of soil erosion, gully formation, and the transformation of perennial streams into intermittent ones soon followed.

Farmers in the Shiwaliks grow rainfed maize and wheat but harvests are low, primarily due to moisture stress, despite a moderate rainfall (1,200 millimeters a year). Cattle are allowed to graze in the hills, and overgrazing has exacerbated the erosion problems already present. An

estimated 100 to 150 tons per hectare is lost to erosion annually, with fully half of the rainfall running off the bare slopes. In one watershed in the Shiwaliks, near Sukhomajri village, only 5 percent of the slopes had any vegetative cover at all by 1974.

In 1975, the Central Soil and Water Conservation Research and Training Institute of the Indian Council of Agricultural Research began work in the Sukhna watershed near Sukhomajri, with partial funding provided by the Ford Foundation. Previous efforts to stem the area's high erosion had failed due to the lack of public participation. Consequently, efforts focused on providing villagers with immediate benefits from the soil conservation work and encouraging public input to the process. Three small dams were built in an adjacent watershed as part of an erosion control research project, and the water was given to the villagers for irrigation. This improved crop yields dramatically and the project managers used this potential for increased productivity to discourage cattle grazing in the hills.

It was clear that no efforts to check erosion would succeed unless grazing was halted. After discussion with villagers and trial-and-error policy implementation, "social fencing" was established: The villagers agreed to give up their grazing rights in the hills in return for water for irrigation. Initially, many problems arose, particularly regarding the equitable distribution of water, but by 1985 the system was well established. Reduced erosion and moister soil has substantially increased grass growth on the surrounding hillsides. Cattle can now be fed more than they obtained when free to graze. Daily village milk sales have increased ninefold, and average annual crop yields have risen 400 to 500 percent. Sediment loss from the watershed has plummeted from 150 tons to 10 tons a hectare per year.

Although begun as a research project on erosion control, Sukhomajri has become a model for village development through improved resource management. Yet, several features of local social organization simplified the problems of implementing the small watershed restoration program, and its replicability is not clear. In particular, most villagers in Sukhomajri owned roughly equal amounts of land and almost everyone belonged to the same caste, so it was relatively easy to achieve an equitable distribution of benefits. Nevertheless, a similar program in Nada village, which has a more complex socioeconomic structure, has also been reasonably successful. The concept of social fencing is being extended to several other villages by both governmental and non-governmental organizations.

Plan Sierra

Many would not consider Plan Sierra a successful rural development project. It has only moderate grassroots support and its sustainability, both ecologically and socially, is questionable. Nevertheless, given the scale of the area's environmental problems and the institutional constraints within which the project operates, Plan Sierra contains more attributes of success than failure. Its achievements are most easily seen by comparison with the ecological devastation of watersheds only 100 kilometers away, in neighboring Haiti.

The northern slope of the central mountain range in the Dominican Republic, the Cordillera Central, encompasses 1,780 square kilometers and provides a home for 110,000 people. The area contains the most important watershed in the country, contributing 90 percent of the flow of the Yaque del Norte, the principal river in the Dominican Republic. The region was heavily forested and relatively lightly populated until the mid-1900s, when growth in demand for timber led to the establishment of sawmills.

Employment provided by the timber industry attracted settlers, many of whom had been displaced by the sugarcane industry in the lowlands, and few of whom had any knowledge of mountain agriculture techniques. The timber industry rapidly overharvested the forest. Excessive logging throughout the Dominican Republic led, in 1967, to legislation closing sawmills and strictly restricting timber harvest. But by then the land had been opened to settlers, and the damage had

been done.

Much of the remaining forested areas has now been cleared under the pressure of shifting agriculture. Fields can be worked for only one or two seasons before the soil's low nutrient content and erosion losses force abandonment. By now 80 percent of the watershed is deforested. Three-fifths of this land stripped of tress has been claimed by the wealthy and used for cattle grazing.

Apart from the impacts of the environmental degradation on the local population, the watershed of the Yaque del Norte has been the focus of projects by the Dominican Republic to develop hydropower and increase irrigation storage. High sedimentation rates are rapidly cutting short the lives of these projects. The obvious costs of the deteriorating environment and the declining standard of living of the rural poor led a local Catholic bishop to propose a rural development plan to the government in 1977.

With support of the government and the church, but with little local participation, Plan Sierra began in March 1979. It has been funded by the government of the Dominican Republic, with contributions from the Ford and Kellogg foundations and from the Swedish and West German governments. Plan Sierra is attempting to implement programs of reforestation, sustainable agriculture, improved health care, education, and transportation.

The Plan opted for a decentralized approach by creating 34 regional units (later reduced to 9) with local field staff, and it encouraged the establishment of some 50 Local Development Councils to provide an avenue for public input. Plan Sierra, though initially a governmental body, in 1983 became an independent civil association.

In its first seven years, Plan Sierra:

* promoted the planting of 5,000 hectares of coffee and nearly 10,000 hectares of pines and other trees;
* established nine rural clinics and trained and equipped 100 midwives and 100 health care workers;
* fostered educational programs in soil conservation, reforestation, and health;
* developed an active women's program;
* established a training center on hillside agriculture; and
* trained more than 3,000 farmers in soil conservation, minimum tillage, the use of legumes as green manure and mulch, composting, polyculture and agroforestry techniques, and the conservation of genetic diversity.

The difficulties Plan Sierra faces, however, are as apparent as its successes. Efforts to find sustainable solutions for the small farmer have been only partly successful, and the growth of coffee is not helping achieve food self-sufficiency, although the crop does reduce erosion when grown in the agroforestry designs promoted by Plan Sierra. Reforestation efforts are hindered by the 1967 legislation outlawing sawmills, thereby minimizing the potential economic benefits of tree planting. However, a recent agreement with the government will allow some timber harvesting under careful management plans. Most significantly, the extremely inequitable distribution of land severely constrains Plan Sierra--the poorest 50 percent of families control only 5 percent of the land, while the wealthiest 11 percent control 66 percent. Much of the erosion originates on grazing lands owned by large landholders who see no economic benefit in reforestation.

Faced with immediate needs to improve the plight of the poor and to establish a legitimate presence, and constrained by the external pressures just described, Plan Sierra has placed greater initial emphasis on human well-being than conservation. But the ultimate success of Plan Sierra rests on the ability to discover and promote ecologically sustainable systems of land use. The resiliency and adaptability of the project to date provide reason for optimism about its ability to succeed.

The Kuna Biosphere Comarca

The Kuna are one of the few indigenous groups in the Americas who have survived with their culture largely intact. The Kuna people, who once occupied a large portion of the Isthmus of Panama, retreated with the advance of the Europeans to some 60 villages scattered among the San Blas Islands lining a 200-kilometer stretch of the Caribbean coast of Panama. Under Panamanian law, the islands and nearly 300,000 hectares of mainland forest (the Comarca) are reservation land over which the Kuna have sovereign rights.

The local tribes depend on marine resources for most of their protein and on the terrestrial portion of the Comarca for forest products, including wood, game, and medicine. A small portion of the mainland is used for agriculture, but the coastal zone has remained predominantly in virgin forest. The importance of protecting the coastal watershed is firmly established in the local culture. The Kuna have traditionally established protected areas of virgin forest, "spirit sanctuaries," in which only certain trees may be cut and no farming is allowed.

The Kuna are not isolated from the world. They are one of the tribes most exposed to formal schooling, and have adopted portions of Western culture as they see fit. A tourism industry exists on the San Blas Islands but it is under Kuna control, with hotels owned and managed by the Kuna. The General Kuna Congress has ultimate authority within the society, but decisions are made primarily through town meetings and a strong sense of community responsibility is found throughout the area.

In 1969, construction began on a branch road of the Pan-American Highway providing access to the Comarca. In the mid-1970s the road was continued through the Comarca to the Caribbean coast as part of a national plan to encourage development of the coastal region. The Kuna recognized that the road would bring substantial benefits, but they also feared the seemingly inevitable influx of peasant farmers in its wake. To establish a presence at the boundary of the Comarca, a small group of volunteers moved to Nusagandi, where the road entered the reservation, and attempted to establish an agricultural colony. After six years of limited success, they concluded that the land was unsuited to agriculture.

As the primary reason for discouraging encroachment by farmers was to prevent the degradation of the natural forest, the Kuna decided to formally designate the area as a natural reserve. By mid-1983, plans for a 90,000-hectare park at Nusagandi had been developed and individuals had been trained in park management. Today, a dormitory for rangers, a cafeteria, and a workshop have been built at Nusagandi, and Kuna volunteers have marked more than 100 kilometers of the boundaries of the reservation. Protection is provided by Kuna rangers and the entire direction of the reserve is under Kuna control.

The technical designation of the reserve has not yet been established, although the Kuna Wildlands Project PEMASKY (Proyecto de Estudio para el Manejo de Area Sylvestre de Kuna Yala) is well institutionalized within the General Kuna Congress and receives funds from that body. Initial plans to create a national park were eventually abandoned because legal control of the land would have passed to the Panamanian government. Currently, the Kuna have applied to the Panamanian government to have the 60,000-hectare "core natural area" at Nusagandi, plus 90,000 hectares of key forest and marine areas, nominated to UNESCO as a Biosphere Reserve and a World Heritage Site. Because the Biosphere Reserve designation would also imply Panamanian sovereignty, the actual request is for a designation of a "Biosphere Comarca."

The Kuna have firmly embraced the connection between environmental integrity and the continuation of their life-style. Legal protection for the Comarca was simplified in the context of national pressures for land by its status as a reservation. Nevertheless, it is clear from historical experience that without the strong community organization and support for preserving ecological integrity, the Comarca could easily have been destroyed regardless of its official designation.

Sian Ka'an Biosphere Reserve

The Sian Ka'an biosphere reserve was established in 1986 on the Yucatan Peninsula of Mexico. The reserve contains:

* 528,000 hectares of tropical moist forests, marshes, mangrove swamps, and freshwater and marine ecosystems;
* 1,200 species of vascular plants;
* 320 species of birds and 7 species of endangered vertebrates; and,
* approximately 800 people who earn a good income from lobster fishing.

In 1979, as a result of the decentralization of Mexico's research institutions, the Centro de Investigaciones de Quintana Roo (CIQRO) was established in the state of Quintana Roo. Scientists at CIQRO saw the potential benefits of a biosphere reserve for conservation and as a center for CIQRO's research program. With support from the state and federal governments, Sian Ka'an was eventually chosen after several sites were considered.

From the outset CIQRO scientists worked closely with local residents to involve them in the planning process. A council of representatives, composed of local residents, scientists, and public officials, was created to provide a forum for discussion of planning alternatives and to give reserve inhabitants a channel for direct involvement with reserve management. The Secretariat for Urban Development and Ecology (SEDUE) is responsible for reserve management. SEDUE designates a board composed of federal, state, and municipal officials that receives management recommendations from this council of representatives.

The benefits of the constant dialog with the local people are already evident. People initially expressed a desire to be granted rights to large pieces of land (200 to 300 acres), which under Mexico's "ejido" system of land tenure would give them permission to use the land, although not ownership. The relatively low fertility of the soil and the fact that the residents of Sian Ka'an were not agriculturalists meant the land would probably have been used for cattle ranching. The council of representatives discussed the costs and benefits, and eventually opted to use smaller tracts for intensive agriculture.

Nearly 95 percent of the CIQRO research budget now goes to some 20 research projects conducted within the reserve. A private non-profit organization, Amigos de Sian Ka'an, has also begun research on residents' resource-use problems. Amigos de Sian Ka'an receives funding from the World Wildlife Fund's Wildlands and Human Needs Program and from The Nature Conservancy, while CIQRO is financed primarily through the state and federal government of Mexico.

One major research focus has been on methods of sustaining and increasing the productivity of the lobster fishery. Studies are under way on the population dynamics of the lobster, and on methods of increasing lobster recruitment. Already, knowledge gained from the lobster research has probably prevented overfishing and increased the income of the residents. Further research is being conducted on a disease ravaging the region's coconut palms and on the development of a sustainable harvesting method for other palm species. In addition, Amigos de Sian Ka'an has established a model farm to demonstrate methods of sustainable intensive agriculture. Nearly one-fifth of Sian Ka'an's residents are now involved either directly or indirectly with the reserve, primarily through participation in research projects.

Sian Ka'an has succeeded in part because pressures on the resources are relatively minor at this time. But the strong regional, national, and international support, the emphasis of research on technologies for sustainable livelihoods, and the involvement of local residents in the project may ensure that the reserve remains successful as development pressures mount.

Brazil's Extractive Reserves

The Brazilian Amazon contains roughly 20 percent of the world's plant and animal species. Still the largest expanse of tropical forest in the world, the Amazon and its people are under increasing pressure from land clearing for resettlement programs and cattle ranching. By 1990, some $6.2 billion will have been spent on projects designed to "open" the Amazon. This so-called development includes the disastrous World Bank Polonoroeste Project, which promoted extensive settlement in the state of Rondônia, a region poorly suited for low-input agriculture.

Population growth in the Amazon is now more than 6 percent per year, primarily due to immigration, yet settlement projects often have attrition rates of 50 to 80 percent because of the land's low productive potential. Some 72 percent of the land deforested in the Amazon is cleared for cattle ranching, an extremely lucrative business as a result of governmental subsidies. In the absence of subsidies, the average cattle ranch would lose 45 to 55 percent of the initial investment over 15 years.

Until recently, plans for the development of the Amazon largely ignored the fate of those already living there. Along with indigenous peoples some 500,000 rubber tappers (seringueiros) live in the Amazon. These people are descendants of northeast Brazilian immigrants who colonized the forest in the late 1800s to tap latex from the wild rubber trees. Serving initially in debt-peonage relationships with "rubber barons," some of the tappers have become more autonomous since the late 1960s.

The principal sources of cash income for the seringueiros are rubber, Brazil nuts, and other forest products. Every family has a house and 2 to 10 clover-leaf shaped paths (estradas) leading between some 180 to 200 rubber trees. Brazil nuts are collected from "groves" of trees, which tend to be more clumped together than the rubber trees. Each family meets their subsistence needs through small-scale agriculture, some livestock production, hunting, fishing, and collection of other forest products. This use of the forest has proved to be an extremely stable system, with many areas having been continuously worked for more than 40 years.

Since the mid-1970s, conflicts between rubber tappers and cattle ranchers have been frequent. The tappers, already somewhat organized from the years under the domination of the rubber barons, strongly resisted the advancing deforestation, primarily through non-violent demonstrations. As a group, they forced their way onto the development agenda in October 1985, when 120 leaders of the rubber tappers met in Brasília to discuss their common interests and goals, and to formulate a response to the increasing pressure on their livelihoods.

One of the most immediate threats was a project financed by the Inter-American Development Bank (IDB) to continue paving BR 364 (the road in the Polonoroeste project) from Pôrto Velho in the state of Rondônia to Rio Branco in the state of Acre. As part of the approval process, the IDB developed a plan to protect the environment and residents' livelihoods, but paving was well under way in 1987 with little implementation of the environmental components. In April 1987, at the urging of environmental groups and after staff meetings with the leader of the rubber tapper movement, the Foreign Operations Subcommittee of the U.S. Senate Appropriations Committee demanded that the work on BR 364 cease until environmental provisions could be implemented.

The idea of "extractive reserves" was first articulated in the 1985 rubber tapper meeting, but no legal instrument existed under Brazilian law to create such a reserve. On June 30, 1987, the Brazilian Ministry of Agrarian Reform and Development, MIRAD, created the legislative apparatus that permits the designation of state land as an Extractive Settlement. Communities can be granted a long-term (up to 30 years), renewable contract for use of the land. Clear-cutting is prohibited but land can be cleared for subsistence agriculture.

Previous well-intentioned efforts to secure the rights of rubber tappers by introducing private property rights had failed when land was divided without consideration of the location of traditional estradas and Brazil nut groves. In contrast, the communal control of the reserves provided under

the Extractive Settlement legislation will allow continuation of the existing informal property rights.

As part of an agreement to restart the financing of BR 364, Brazil has now proposed to the IDB the creation of four extractive reserves in Acre and Amazonia, totalling 500,000 hectares. In Rondônia, the World Bank is including plans for extractive reserves as part of the ongoing Polonoroeste project. In 1988, the state government of Rondônia plans to set aside specific areas for the establishment of extractive reserves. MIRAD has enthusiastically supported the creation of extractive reserves.

Extractive uses of the Amazon have proved to be sustainable and provide a model for the compatible roles of development and conservation. Reserves provide direct economic benefits to the seringueiros, undisturbed land for indigenous people, and invaluable protection for genetic resources. Because both the rubber and cattle industries are subsidized by the Brazilian government, the economic value of extraction as opposed to other land uses is not completely clear. Over a 10-year period, the net present value of extractive reserves appears to be slightly lower than that of either cattle ranching or agriculture. But because neither ranching nor agriculture can be sustained in the Amazon, the present value over 15 to 20 years favors extractive use of the forest.

Extractive reserves could be a valuable concept for a wide variety of tropical forest environments around the world. They have been endorsed by the World Bank, but not yet implemented outside Brazil.

Guanacaste National Park

With nearly 10 percent of its territory protected in national parks and reserves, Costa Rica has one of the highest proportions of protected land in North and Central America. The country's stable government--a democracy for almost 100 years--and the presence of active public and private conservation leaders and non-governmental organizations (NGOs) have stimulated investment in conservation. In 1987, Costa Rica received foreign contributions of $5.4 million for conservation activities and the government itself invested heavily in conservation. But the country also has the distinction of having one of the highest deforestation rates in Latin America. Expansion of cattle ranching and the ability of farmers to claim ownership of land once they clear it has all but eliminated the remaining unprotected natural ecosystems.

The most threatened forest ecosystem in Costa Rica is not the rain forest but the tropical dry forest. These woodlands once stretched along the Pacific Coast of Central America from Mexico to Panama, but now less than 2 percent of this area remains in natural forest. In 1985, the Costa Rican government, local NGOs, and concerned scientists launched an effort to restore a portion of this dry forest. The goal is to use existing fragments of natural forest in northwestern Costa Rica as "seeds" to restore an area of 75,000 hectares that will become Guanacaste National Park.

Since 1985, more than $8 million has been raised from international contributions toward a goal of $12 million for the purchase of land. By mid-1987, 46 percent of the proposed park was owned by the project and down payments had been made on another 19 percent. Part of the acquisition is being financed through debt-for-nature trades. Conservation organizations in Western countries provide money to buy discounted notes of Costa Rica's debt and the government, in turn, redeems the notes with high interest bonds that are deposited with Fundación Neotrópica, a local conservation organization, for use in the land purchase. Land bought for the park becomes the property of Fundación Neotrópica and will be transferred to the park service when acquisition is complete.

"Restoration ecology" may or may not be a conceptually simple task, depending on the ecosystem involved. Given sufficient time and lack of disturbance, the dry forest might recover on its own. But human efforts can increase the rate of recovery and reduce the number of species lost before the forest fragments, too small to maintain some species, expand and link together. To

speed recovery, trees are being planted and fire control efforts have begun. Some livestock grazing is allowed to control the growth of a dense introduced grass that reduces the survival of tree seedlings. The "complete" recovery of the forest is expected to take some 300 years, but substantial environmental benefits will appear much sooner.

Although the proposed park was not heavily populated, nearly 40,000 people living nearby will be influenced by its presence. The park will provide benefits in the form of watershed protection, income from tourism (currently $200,000 annually and expected to grow to $1 million), and employment for local residents as park guards, managers, and research assistants. Moreover, a significant effort is being made to provide the people with educational benefits from the park.

The project managers are aware that the survival of Guanacaste Park will depend on its acceptance by local residents. By establishing educational programs directed toward schoolchildren, civic groups, and tourists, the park will gain from the increased awareness of the importance of conservation while the people gain from a better understanding of their environment. Currently two biologists are employed as teachers and more will be hired as the park grows.

Costa Rica provides a political environment supporting conservation that is probably unique in the Third World. Moreover, both the ecological and social considerations in the establishment and restoration of Guanacaste Park are directly linked to local conditions. Thus, this effort cannot be recreated wherever ecosystems are about to be lost. Yet Guanacaste provides an example of a conservation tool that may be applied in appropriate circumstances.

The Kenyan Jiko Charcoal Stove

In Kenya, 83 percent of urban households and 17 percent of rural households use charcoal stoves, known as "jikos." In 1980, some 477,000 tons of charcoal were burned in household cooking and the demand is increasing 6.7 percent annually. A household in Nairobi with one wage earner typically spends more than a fifth of its cash earnings on charcoal.

The traditional stove design, introduced in the early 1900s, is a metal cylinder with a door for ash removal, metal legs, and triangular flaps to support a cooking pot. In the late 1970s, several improved stoves were developed, including all-metal versions and traditional jikos modified with a ceramic lining. In 1981, the government of Kenya and the local non-governmental organization KENGO (Kenyan Energy NGOs) began a project promoting the dissemination of improved woodstove technology as part of the Kenya Rural Energy Development Project, supported by the Kenya Ministry for Energy and Rural Development and the U.S. Agency for International Development. A variety of organizations have provided technical and financial support since then, including CARE, Appropriate Technology International, and the Intermediate Technology Development Group.

The project's initial goal was to manufacture and sell 5,000 improved jikos by 1985. In fact, 13,000 stoves were sold by the end of the first full year of operation, and by mid-1986 the new industry was well institutionalized and 125,000 stoves had been purchased. It is estimated that the new industry has captured 10 percent of the traditional jiko market. Nationwide, annual savings in fuel amount to 1.5 million tons of wood, worth approximately $2 million per year.

Two key factors set this project apart from many failed counterparts--the high level of local participation in stove design, and the reliance on informal sector artisans rather than consumers to build the stoves. The project planners decided early to pursue the development of a modified jiko rather than attempt to introduce an entirely new design. In 1983, two prototype stoves were tested in 450 households in Nairobi and Mombasa. The researchers worked closely with metal and ceramic artisans to develop a durable product that could be standardized and manufactured easily. Information from both producers and users was integrated into the final stove design.

The project provided training and credit to artisans and demonstrated the stoves at exhibitions and on TV and radio to encourage demand. By early 1985, some 30 enterprises were

producing the ceramic liners or complete stoves, and at least 22 wholesalers were distributing them to more than 73 retail distribution points. The efficiency is 29 to 30 percent and, although it costs two to three times more than the traditional jiko, the improved version lasts twice as long. For the average Nairobi family, the stove can pay for itself in only a month.

The project is clearly a success, although it is not without problems. The stove costs enough that low-income households have been slow to adopt it. Also, the improved stove may encourage a shift from wood fuel to less efficient charcoal.

Ladakh Rural Development

Ladakh is a high-altitude desert in the Indian states of Jammu and Kashmir, covering 104,000 square kilometers on the western edge of the Tibetan plateau. The region is home to 120,000 people living in scattered villages at elevations of 11,000 feet or more. They grow wheat and barley in small terraced fields and keep a few animals that are allowed to graze during the summer in what pasture is available. In 1962, a new road linked Ladakh with the remainder of India, and the society was challenged with the forces of modernization. In general, the traditional culture is still strong today and the people enjoy a high standard of living relative to other areas in the Third World. But population growth and changes in land-use practices are now straining available resources.

The Ladakh Project was founded in 1978 by a Swedish linguist to enable local people to make more informed choices about their future and to help them maintain the diversity of their culture and environment, if these were goals they desired. The project has tried to provide information on both the negative and positive impacts of "development" in order to balance the almost exclusively positive images Ladakhis are exposed to through the media and tourism. It spawned the indigenous Ladakh Ecological Development Group (LEDeG), and in 1984 a Centre for Ecological Development was inaugurated by Indira Gandhi to provide a central coordinating site for the largely community-based activities. The Centre has served as an outreach site not only to Ladakh but to much of the remainder of India as it has become something of a tourist attraction. The building is solar-heated, electricity is provided by wind generation, and solar cookers, dryers, and a greenhouse are found nearby.

The Ladakh Project organizes meetings and seminars for Ladakhis to discuss development options. At village meetings special attention is given to problems of sustainable agriculture. The project has initiated campaigns to promote public health, and has encouraged visits by school groups to the Centre for Ecological Development. It has produced a syllabus on ecology for schools and a course for 10- to 12-year-olds.

The project also promotes appropriate energy technologies. Trombe walls, which efficiently capture solar energy for space heating, have been installed in 70 houses, and the project receives more requests for technical assistance for installation of Trombe walls, or variations adapted to specific needs, than it can handle. The Trombe wall costs an additional $200 per room, but savings in heating costs can repay this investment in two to three years. Passive hot water heaters that cost $30 to $90 are being built, 20 greenhouses have gone up, and more than 100 solar cookstoves have been sold at subsidized prices. The project has developed a water-powered grinding mill and a water-powered water pump to provide household and irrigation water on property above the height of stream channels. At the invitation of the Kingdom of Bhutan, the project is now helping people there build wind and water pumps and solar water heating systems.

The Ladakh Project is not really a grassroots initiative. It is the result of far-sighted work of individuals who recognized that "development" would not meet the needs of Ladakhis unless people were well versed on its options, pitfalls, and benefits and, perhaps most significantly, unless they had sufficient information to allow the costs and benefits of their current land-use practices and culture to be compared with the alternatives. The introduction of appropriate technologies has

been subsidized by the project and by the Indian government, and thus they may not spread spontaneously. But the goal of the project is not to sell appropriate technology. Rather, it is to establish a process for rational development. And it is clearly achieving that goal.

Guinope Rural Development

Much of Central America is plagued by problems of declining soil fertility caused by soil erosion and the continual monocropping of maize. By the late 1970s, maize yields in the Guinope area of Honduras had declined substantially, largely as a result of the loss of much of the area's topsoil. The low productivity caused people to flee either to other arable land or to the capital, Tegucigalpa, and forced farmers who remained to adopt shifting cultivation.

In 1981, World Neighbors, with support from the Honduran Ministry of Natural Resources and a private Honduran group, the Association for the Coordination of Development Resources (ACORDE), began an agriculture development program in Guinope and three surrounding villages in an effort to end the cycle of declining productivity.

With technical assistance from ACORDE, World Neighbors oriented the program toward simple technologies that could stem erosion and restore land fertility. The program introduced soil conservation practices already in use elsewhere in Central America (such as contour and drainage ditches, and contour grass barriers and rock walls), and taught fertilization methods involving the use of chicken manure, green manure (intercropping of leguminous plants), and some chemical fertilizers.

In the first year, the yields of farmers adopting the techniques tripled or quadrupled--from 400 kilograms per hectare to 1,200 to 1,600 kilograms. In the next five years, 40 other villages requested training in the soil conservation practices. This obvious success was achieved with no subsidies or donations; all costs of the agricultural production were carried by the farmer. With the spread of the program into other villages, the benefits now cover an area stretching from the Nicaraguan border, halfway to Tegucigalpa.

The extension methodology used by World Neighbors differs from the Training and Visit approach favored by the multilateral development banks. The new technologies are taught in the field through hands-on activities by the farmers, initially in small-scale experimental plots on private lands. Classes are taught by village farmers who have already had success with the same technologies. For the Guinope program, these farmers initially came from a nearby region of Guatemala where World Neighbors had worked for several years on a similar program, but all the extension staff are now from the local area. In addition to increased crop yields, the impacts of the program have been broad. Outmigration has largely been reversed as workers and farmers are attracted to the employment and agricultural potentials in the area. Many landless farmers have acquired fertile land through reclamation using the soil conservation technologies. The use of chicken manure for fertilizer has created a market for what had been a waste product generally dumped into rivers in the Tegucigalpa area, and shifting cultivation is ceasing, thereby protecting the remaining forest cover. Finally, the high yields are allowing farmers to reduce the area planted to subsistence maize and to begin planting vegetables for sale. World Neighbors is working with the community to develop an outlet in Tegucigalpa for the produce.

In its first six years, the program cost $333,000. During this time 1,200 families adopted the conservation technologies and 60 local villagers were trained as agricultural extensionists. Above and beyond World Neighbor's efforts to meet the requests for training from other villages, the technology is spreading from farmer to farmer and through Honduran Ministry of Natural Resources programs. The project has also fostered the use of small-scale experimental plots on farmers' lands to test new methods of increasing productivity. The seeds of adaptive improvement in yields have thus been planted.

Wildlands and Human Needs Program

For years, the World Wildlife Fund (WWF) has been instrumental in the identification of critical habitats and threatened species and in the development of national and international systems of protected areas. The WWF Wildlands and Human Needs Program integrates the management of natural resources with grassroots development projects in order to improve the quality of life while protecting biologically important wildlands. The program recognizes that enhancing the quality of life is a precondition for population stabilization, without which pressure on the environment will grow. It is an outgrowth of the observation that only by addressing human needs can the world hope to slow the overexploitation of resources and the decay of ecosystems.

The Wildlands and Human Needs Program identifies critical biological resources threatened by the inability of the rural poor to meet their resource needs in a sustainable fashion. Drawing on close ties with private development groups, projects are established to provide benefits through land titling, improved management of wildland resources, income generation, and small-scale community development. The program demonstrates a variety of low-risk technologies and management strategies that communities can incorporate as they see fit.

This WWF effort was initiated in 1985 with a matching grant from the U.S. Agency for International Development. Thirteen core projects have been established--in Cameroon, Central African Republic, Costa Rica, Dominica, Ecuador, Madagascar, Mexico, Nepal, Peru, Saint Lucia, Thailand, and Zambia. In addition, the program provides short-term support for innovative projects that integrate conservation and development, and trains host-country resource managers, community leaders, and staff from private voluntary and other non-governmental organizations. The Sian Ka'an Biosphere reserve serves as one model of a successful Wildlands and Human Needs project. Other program successes include:

* Annapurna Conservation Area Project (ACAP), Nepal. Annapurna is Nepal's most popular tourist destination, with some 25,000 visitors annually. The pressure this creates threatens both the local culture and the region's limited resources. In particular, fuelwood collection to provide energy for the 130 trekking lodges and tea shops is exacting a heavy toll on the environment. ACAP is attempting to balance the needs of local people, tourists, and the environment by providing conservation education (targeting both tourists and residents) and information on sustainable resource use. The project is establishing programs for reforestation, overgrazed land rehabilitation, alternative energy sources (kerosene, solar, and micro-hydro), family planning, and health care. Trekking fees provide a substantial and established source of funding for development projects within the conservation area.

* Southeast Coast Resource Management Program, Saint Lucia. The 30,000 residents of the southeast coast of Saint Lucia face serious problems from overexploitation of fish, firewood, and grazing land. This program is enhancing the agricultural and fishing activities of the people and providing increased protection for the Maria islands, two small points of land near the coast of Saint Lucia with unique wildlife habitat. The project works with particular groups (such as charcoal producers and fisherfolk) to provide alternative methods of resource use and sources of income. Included are programs of education, training, cultural conservation, marine conservation, and tourism. Public support for, and participation in, the project is high. Two cooperatives of resource users have been established, and communities are involved in resource management decisions, including the selection and demarcation of informal protected areas.

Central Visayas Regional Project

The Central Visayas region of the Philippines suffers severely from declining soil

productivity and rural poverty. In some watersheds, population pressure and a poor natural resource base led to extensive deforestation as early as the mid-1800s. Deforestation and overgrazing have resulted in high rates of soil erosion that, in turn, have reduced soil fertility and nearshore marine productivity through coral reef siltation. Destructive fishing practices (such as the use of dynamite, cyanide, and a destructive netting technique known as Muro-ami), coral harvesting, overfishing, and mangrove clearing have further degraded the marine resource potential.

Extreme population pressure in the Central Visayas region has forced many farmers onto steep, erosion-prone slopes despite a law preventing private ownership of land exceeding 18-percent slope. Those tending these public lands have no secure rights to them, and they have been reluctant to contour their farms, plant trees, or make other permanent improvements for fear that they would not reap the benefits. Similar problems have hindered sustainable management of the nearshore marine resources. The "common property" attributes of the fisheries and mangrove stands have led to overharvesting and resource degradation.

In July 1984 the World Bank initiated the $35-million Central Visayas Regional Project (CVRP), providing 72 percent of the funding. CVRP activities have centered on community organization, the provision of secure tenure over primary resources, and the introduction of appropriate technologies. The project also includes components designed to improve rural roads, trails, and water supplies; to strengthen research and training programs; and to bolster the capacity of local governments to prepare and implement community-based development plans.

The farmers, fisherfolk, and forest occupants of the Central Visayas are the actual resource managers, despite the illegality of their situation. At the urging of the Bank, the Philippine government extended a rarely used land tenure instrument, the Certificate of Stewardship Contract (CSC), that provides a 25-year renewable lease to farmers on public land and to forest dwellers. In addition, the project has supported the establishment of community timber utilization permits, smallhold timber concessions, community reforestation contracts, artificial reef licenses, and municipal sanctuaries.

CVRP uses watersheds as natural functional units for planning, and has targeted six watersheds encompassing an area of 162,500 hectares. The upland watershed component stresses the establishment of sustainable farming methods through physical and vegetative contouring, the planting of perennial crops, and agroforestry. Soil fertility is to be improved through organic mulching, composting, leguminous hedgerows, and fallow periods. Particularly on extremely steep slopes (30 to 50 percent), efforts are being made to reduce grazing pressure, establish leguminous cover plants, and eventually diversify the land use into perennial crop production.

The nearshore fisheries component establishes family-managed artificial reef clusters, supports the replanting and management of mangroves under smallhold user-rights permits, and sets up community-based management of coral reefs through municipal ordinances. The social forestry component provides public forest occupants with the potential to earn an income from the collection and sale of dead wood, and establishes on-site nurseries for reforestation.

The project is unique in the Philippines in its regional approach; funding goes directly to the regional coordinating office rather than through the national government (although under the current government, budget allocation and hiring responsibilities have returned to national control). CVRP is attempting to develop community-based resource management by emphasizing a decentralized approach and supporting grassroots involvement in resource management issues. Local elected officials, members of the public, and representatives of non-governmental groups participate on Regional Development Councils for the 11 geographic areas ("site management units") involved in project implementation. Moreover, existing Barangay (Village) Development Councils have been given increasing responsibility for the formulation of development plans.

CVRP has fallen well short of its initial goals, largely due to delays involved with changes in land and resource tenure. The issuance of stewardship contracts was hindered by the Ministry of Natural Resources, which initially opposed the delegation of authority to the regional level.

Moreover, many individuals and groups have opposed this approach because they fear loss of revenue generated from illegal land claims. For example, some public land has been claimed by absentee landlords and then "rented" to farmers. Moreover, municipal governments fear a loss of tax revenue if illegally taxed areas are converted to stewardship contracts.

Some components of the project, particularly social forestry, have largely failed. The provision of rights to dead wood without rights to overall forest benefits encouraged forest dwellers to burn forests. In addition, initial efforts to stimulate grassroots organizations of forest users failed. One particularly troubling problem has been the failure to collect adequate baseline data and to maintain adequate project documentation. The poor monitoring and evaluation record may prevent an accurate assessment of the benefits and costs of the project.

But CVRP, from its inception, has been a pilot project. It was designed as an experiment and a stimulus to other regions within the Philippines. The successful attributes of the project, particularly those involving changes in resource tenure, could promote the adoption of these policies in other areas. Several national departments have already begun using some of the CVRP technologies. For example, the Ministry of Natural Resources is now awarding stewardship contracts elsewhere in the Philippines. The development of community-based resource management techniques, including community participation in all aspects of planning and implementation, will be invaluable in efforts to spread the successes of CVRP. By the same token, the project's failures, such as being unable to thrust grassroots organization onto forest users, also provide useful lessons.

Family Planning in Zimbabwe

The use of modern contraceptives in Zimbabwe jumped from 14 percent of married women of reproductive age in 1981 to 27 percent in 1984. Overall, some 38 percent of women of reproductive age were using some means of birth control, including traditional contraceptive methods, in 1984--one of the highest percentages in sub-Saharan Africa.

The family planning program in Zimbabwe is surmounting obstacles that have hindered programs throughout the region. Because of a complex set of cultural and economic incentives, the family size desired throughout sub-Saharan Africa is often high. In countries with dim economic outlooks and poor health care, large families help meet needs for labor on farms and provide the parents with care and security in their old age. Moreover, in many parts of Africa, the size of a man's family is a measure of his wealth and status. Thus, a husband may wish to have a larger family than his wife deems appropriate. When women do want to limit family size, their low status and lack of legal rights subordinates their choice to that of their husbands. Until 1982, no woman in Zimbabwe could legally make decisions about a wide range of matters, from marriage to the purchase of goods or services.

Political controversy has also slowed the acceptance of family planning programs. For instance, organized family planning efforts were first established in 1965 in Zimbabwe, but by the mid-1970s many people believed the program discouraged childbearing among Africans while encouraging high fertility among Europeans. Consequently, national support for it was reduced when the government changed hands in 1980.

The profile of the national family planning program changed dramatically in 1983, in part because of the growing strength of the women's movement in Zimbabwe. In 1982, the government passed legislation recognizing the right of women to make individual decisions after age 18. By 1983, women in Zimbabwe, increasingly aware of their civil and personal rights, demanded that the government make family planning services more accessible and affordable. That year, more than 1,000 representatives of the Women's League of the Zimbabwe African National Union-Patriotic Front met with the family planning program officials to demonstrate their concern over the worsening state of reproductive health in the country.

In response to the demands, and in recognition of the severity of the population problem

within the country, the government of Zimbabwe adopted substantial institutional changes in the orientation of the family planning program and revised its population policy to strongly support family planning initiatives. The program, now titled the Zimbabwe National Family Planning Council (ZNFPC), changed from an isolated operation to a program connected with nearly every government agency. ZNFPC has organized an extensive contraceptive distribution system and has established strong educational and training efforts, a national reproductive health survey, and a statistical office.

The backbone of the ZNFPC program is a network of 637 community based distributors (CBDs) of contraceptives and advice. Almost all the CBDs are married women with children, and using contraceptives themselves. They are selected by their communities and receive six weeks of training from ZNFPC in population issues, communication skills, family planning information, and clinical skills. Each distributor travels door to door by bicycle in an area with a radius of 20 kilometers. The services and contraceptives are provided free to all with monthly incomes less than $94, the national official minimum wage.

Despite the success of the program in fostering contraceptive use, fertility rates have not yet changed. Instead, some 90 percent of women accepting family planning services began contraceptive use to increase the spacing between births. Yet this can have as great an effect on population growth rates as reduced fertility, and the program will clearly help alleviate Zimbabwe's population problem. Moreover, it provides women with greater control over their right to choose when to bear children and how many to have--an unmeasurable but tangible improvement to the quality of their lives.

Fish Culture in Zaire

In parts of rural Zaire, fish provide an important supplement to villagers' diet. In particular, tilapia have been harvested from rivers for centuries. These fish are extremely prolific, hardy, and well suited to pond culture. In the mid-1950s, the Belgian government introduced pond culture of tilapia to Zaire (then the Belgian Congo). By 1957 some 93,500 ponds had been constructed by villagers, and the colonial government had created a research, training, and fingerling supply system throughout the country. But it never provided adequate extension training for pond construction and management, and nearly all ponds were abandoned after independence in 1960.

In 1973 and 1974, the Peace Corps studied the feasibility of reintroducing fish culture to Zaire; eight volunteers trained in this field were assigned to the Kikwit area in 1975. Farmer interest in the project was high and in 1978 the project was expanded, with additional support from the Zaire government and the U.S. Agency for International Development, to other regions.

To date, an estimated 10,000 farmers have adopted the fish culture techniques. Fingerlings are produced in the ponds as a by-product of tilapia culture. The farmers can thus restock their own ponds and sell the excess to others establishing new ponds. The project is scheduled to receive continued support through 1993.

Fish culture was introduced in a region where the people were predisposed to eating fish and where it was still practiced as a remnant of the colonial effort. The technology is low-risk, due to the hardiness of the species, and aside from initial purchases of fingerlings, no startup capital is needed. All subsequent inputs are available locally and the fish not used by the family can be sold to neighbors.

The extension methods that were used contributed significantly to the success of the project. Peace Corps volunteers began work with dozens of farmers but provided continued support only to those able to meet standards for quality of work. Thus, all ponds that were built were high-quality ones that served as demonstrations for the program. Pond management techniques are somewhat complex, and thus sustained extension support by volunteers for four to eight years has proved to be a key element of success. Where the volunteer post has already been dropped, the role has

been largely assumed by groups of fish farmers that have formed spontaneously to discuss management problems.

The Zaire fish culture project succeeded by identifying an appropriate technology for a specific region and refining an extension methodology in light of technical needs. The project may be replicable in many areas with relatively little modification. The introduction of tilapia in some regions of the world has seriously disrupted freshwater ecosystems, however, so care must be taken to ensure that both the social and the biological attributes of fish culture are in keeping with area needs.

Agroforestry Outreach in Haiti

Haiti, with a per capita gross national product of $377 and an average rural annual income of less than $100, is the poorest nation in the western hemisphere. Life expectancy is 54 years, and only one-quarter of the people are literate. Even with the 1986 overthrow of the Duvalier regime, Haiti has not been able to emerge from the grips of a failed economy, a corrupt government, and a devastated environment.

Many of Haiti's environmental problems can be traced to deforestation. In 1950, four-fifths of Haiti was forested. Today, forests cover less than 8 percent of the country. Seventy-two percent of energy demand in Haiti is supplied by fuelwood and charcoal. In 1985 a deficit of 3 million cubic meters existed between the estimated annual production and consumption of wood. Declining soil productivity and erosion have led to stagnation in agricultural productivity, yet most forestry and soil conservation projects have been unsuccessful.

According to Haitian law, tree-owners must pay a 5¢ tax to the state before cutting a tree, and the proceeds are to be used to finance state nurseries that supply farmers with free seedlings. In practice, however, forestry officers collect $1 to $5 a tree and the money never reaches state-run nurseries. Thus, farmers lack incentives for reforestation. In 1981, the U.S. Agency for International Development funded an $8-million Agroforestry Outreach Project (AOP) to promote trees as a cash crop. The project design grew directly from lessons of the limited successes and the failures of 19 previous erosion control projects in Haiti. In general, peasants had been urged to plant trees or dig contour terraces on hillsides through direct payments or "food for work" programs, but the projects could not create an environment in which the trees or contours would be maintained.

AOP initiated a tree growing program that was to be profitable for the peasants. Largely because of a lack of commitment by the Duvalier government, funds for the project were distributed to three private groups: CARE; the Pan American Development Foundation (PADF), which acted as an umbrella organization for more than 170 smaller Haitian and U.S. religious non-governmental organizations (NGOs); and Operation Double Harvest (ODH), which was involved primarily in nursery production and tree-farming operations.

One of the most innovative aspects of this project has been the use of PADF as an intermediary NGO to support the activities of a large number of smaller groups. The major donor is able to avoid the added administrative costs of dealing with many small NGOs, while the small organizations avoid the bureaucratic requirements of loan and grant recipients.

The PADF and CARE projects were implemented through local residents who received training in agroforestry extension. Agents gave farmers free seedlings and information on options for integrating trees into their farms. After planting, the agents followed up with visits to provide information about the care and management of the seedlings and trees. To stimulate demand, the extension agents pointed out the economic incentives for planting and stressed that the farmer had complete control over what species to plant, where to plant them, and when to harvest. The tree harvest tax is still present, but the economic benefit of the trees exceeds the tax when the trees cost the farmer nothing.

Trees are produced in regional nurseries supported by CARE, PADF, and ODH. By 1986, 39 nurseries supported by CARE and PADF were in operation, producing more than 5 million seedlings per year. Approximately 110,000 farmers had planted more than 25 million seedlings, with a survival rate of 50 percent. The combined rate of return for the CARE and PADF projects was 15.6 percent over a 20-year period. The cost per surviving tree was only 63¢ to 75¢, less than a quarter of planner's original estimates.

The project has proved to be flexible in response to needs for increased efficiency. Central nurseries have given way to smaller ones run by NGOs, and initial tree maintenance subsidy payments of 5¢ per tree per year for the first two years were quickly ended when farmer response showed they were unnecessary. Tree species composition has changed from the use of five exotics in the first year to the use of 40 species in 1986, with 19 of them indigenous (accounting for 38 percent of PADF production). The composition altered largely in response to farmers' preferences for familiar species and for trees that provided a mix of products rather than just fuelwood.

Tree planting has diversified farm production, increased farmers' incomes through the sale of wood and tree products, buffered them from droughts that may decimate annual crops, and allowed the sustainable use of marginal land. Soil erosion has been reduced and the fertility and moisture of the remaining soil has been increased.

But while the project has surpassed its goals and it possesses features of ecological sustainability, its institutional sustainability is questionable. It depends on funds supporting nursery production and these are due to end in 1989. Plans have been made to start charging for seedlings, but this raises equity problems since only wealthy farmers will be able to afford trees. For some species, particularly the introduced eucalyptus and Leucaena leucocephala, resprouting of cut trees can maintain tree cover even in the absence of nursery production, and other species produce volunteer seedlings. Nevertheless, the scale of reforestation will undoubtedly drop when outside assistance ends.

Java Social Forestry Program

In Indonesia, as elsewhere in Southeast Asia, forest resources are increasingly being used to generate export revenues and employment for a rapidly growing population, and to provide watershed protection for lowland agriculture. On the island of Java these demands are particularly acute: Low oil prices have raised the importance of Indonesia's non-oil exports such as timber, and the island's population (over 100 million people) is growing at more than 2 percent per year.

The State Forestry Corporation (SFC), a semi-autonomous unit of the Ministry of Forestry, has the task of managing Java's 2 million hectares of production forest land. The SFC has been unable to fulfill its mandate to generate export revenues, provide rural employment, and protect upland watersheds. Traditional methods of policing forest boundaries have not prevented people from entering the forest for food, fuelwood, and fodder, nor has the traditional practice of allowing farmers to plant annual crops on recently reforested land for two years provided sufficient incentive to be viable either for the farmers or for reforestation.

In 1984, Ford Foundation staff in Indonesia began working with SFC officials and representatives from other public and private agencies to discuss new forestry strategies. A workshop that brought together forestry officials, university scientists, and Ford Foundation staff generated interest in a cooperative effort to find practical solutions through a phased program of research and pilot projects.

The program proposed by the workshop was endorsed by the Forestry Ministry, which agreed to the creation of a national Social Forestry Working Group in late 1984. That Group's mandate is to explore more ecologically and socially sound forest management practices. It commissioned 12 case studies of how the SFC might change its procedures to better meet the needs of poor farmers while ensuring the success of reforestation and minimizing conflict with villagers.

Each researcher lived in one of the 12 research sites in West and Central Java for about seven months, collecting data on forest exploitation patterns in each village.

In September 1985, the Working Group convened a three-day workshop to analyze the data. It confirmed that relations between the villagers and the SFC were highly antagonistic, but that the SFC officials were, for the first time, willing to discuss the problematic social and political dimensions of the agency's work.

In 1986, 13 social forestry pilot projects were begun under the direction of the Working Group, focused on fostering village-level farmer organizations that could work with SFC officials in decisions about local forest management. The agroforestry systems employed are designed to generate benefits for the farmers that are greater, more diverse, and longer lasting than before. The commercial tree species are spaced more widely apart in order to offer more space for annual crops and additional harvests before the tree canopy closes. Farmers are encouraged to incorporate fruit, fuelwood, and fodder trees. Equally important, the pilot projects are staffed by personnel specially trained in community organization by Yayasan Bina Swadaya, a prominent Indonesian non-governmental organization (NGO), which is encouraging substantive participation in decision-making by the farmers. This organization is one of a group of institutes for community self-help in Indonesia.

These new modes of cooperation have been continuously monitored and documented so that the Jakarta-based Working Group can modify the program based on results in the pilot projects. In February 1987 pilot project staff reconvened for a workshop on the first year of implementation. Problems emerged on a number of levels, including training, site selection, and field supervision. But in general the program is opening up new forms of productive cooperation benefiting both the forests and the farmers. Unlike many other social forestry projects, NGOs have provided the organizing and training support.

In 1987, 61 new forestry sites were established, many on severely degraded land that will require significant rehabilitation before becoming productive. The rapid expansion of the program raises questions about the ability of so many farmers to be properly trained, but Yayasan Bina Swadaya has received another grant to continue the training program, and has six of its staff working inside the SFC at national and provincial levels to provide both advice and monitoring of the program's implementation.

Because of questions raised about barriers to effective participation by the poorest members of the community, including lack of investment capital and the inability to sacrifice daily wage labor, the Ford Foundation has also provided a grant to the Bogor Agricultural University to support undergraduate and master's level research on the program. Studies are under way on such topics as benefit-cost analysis of the new system, the role of women in program-related decision-making, and the impact on farmers' attitudes toward the SFC.

The Ford Foundation has provided about $1.5 million to the SFC, Yayasan Bina Swadaya, Bogor Agricultural University, and other consultants over the past five years, and has facilitated the continuing development of the Working Group on Social Forestry, which has played a key role in obtaining consensus on the new approaches.

Central Selva

The Central Selva project deserves to be considered a provisional success, in part just because its current format is vastly superior to the initial concept. Moreover, even during implementation it has undergone significant changes to meet the local development needs. It provides one of relatively few examples of flexibility in large aid projects in response to unacceptable environmental and social impacts.

The project was originally proposed by Peru to the U.S. Agency for International Development (AID) as an area development project for the Palcazu Valley in Peru. The emphasis

was on the routing of a main highway, the Carretera Marginal de la Selva, through the valley to open the basin to agriculture and development. The project largely ignored the fate of some 6,000 Amuesha natives living in the region as well as 6,000 settlers who had established landholdings in the area over the past century.

The original project also ignored the tremendous biodiversity of the region. Currently, tropical forest covers 85 percent of the lower valley and the region supports more than 1,000 species of trees alone. Moreover, the initial design assumed that the land would be suitable for agriculture. Instead, agricultural potential was limited to forestry by the area's heavy rainfall; by erodible, acidic, and infertile soils with aluminum toxicity; and by steep terrain.

Faced with the strong opposition of Indian rights and support groups, and after reviewing information from field studies on the agricultural potential for the area, U.S. AID revised the project concept to emphasize sustained production through appropriate land use. The five-year project began in 1982 with a commitment of $22 million in loans and grants. It was extended in 1987 for an additional three years as a result of delays in implementation.

U.S. AID recognized that the valley could not support extensive agriculture but still included a significant component of high- and medium-input farming in the initial project design. As evidence of the fragile nature of the lands in the Palcazu mounted, the project staff in Peru de-emphasized the agricultural aspects except to support low-input farming technologies. The staff then focused the project on the establishment of sustainable forestry practices. Because of the novel nature of the project, it is most appropriately viewed as a pilot for research and development of ways to use the high jungle sustainably. The methods developed could prove useful throughout South America, particularly in the Amazon.

A key feature of the project is the testing of "clear-cut strip forestry" as a method of natural forest management. Strip-cutting is intended to simulate natural gap generation in tropical forests. Each strip is 20 to 50 meters wide, with length determined by topography and logistics, and strips are no closer than 200 meters to each other. Preliminary research indicates that strip-cutting can produce essentially natural patterns of regeneration and support harvests on 30- to 40-year rotations. Because strip forestry affects a greater area than natural gap formation, species losses may be unavoidable, but this technique would have far less impact than traditional clear-cutting on biodiversity. In 1986, a forestry cooperative was established in the indigenous communities to develop a local capability for the management and marketing of timber.

Replicability of the strip-cut technique may be somewhat difficult. The method appears to be more acceptable to indigenous people than to colonists, it requires substantial amounts of technical assistance to design harvest units and to foster the growth of appropriate species, and a market must be developed for the small timber that is removed during cutting.

The project also includes agriculture and livestock components (demonstration of production and marketing of coffee and palm heart, demonstration of pasture renovation, and introduction of hair sheep), the setting aside of 33 square kilometers of the neighboring San Matias mountain range as a protection forest, and the designation of 1,330 square kilometers of the neighboring Yanachaga range as the Yanachaga-Chemillen National Park. Progress on the Central Selva has been relatively slow. The government of Peru has tended to encourage extractive forest management, and acceptance by the government of sustainable forest techniques has been slow to arrive. Moreover, as one part of the project, land titles were granted to native communities and settlers, and this process also faced significant governmental delays. The project, even with the three-year extension, may not meet its realistically revised goals. Nevertheless, its adaptive, experimental approach is developing the methodologies that could aid sustainable tropical forest management throughout the region.

Small Organic Farming in Chile

Unlike farmers in much of the developing world who inherited techniques of sustainable agriculture from their ancestors, many Chileans do not have an extensive knowledge of farming techniques suitable for small holdings. Indigenous cultures were largely displaced by settlers who, prior to land reform, used capital-intensive large-scale agriculture and plantation systems. Peasants who finally obtained plots of land lacked knowledge of options for sustainable management, and the growing population of urban poor made no effort to use what little land was available because of its low potential for production.

Seeking to fill this information gap, the Centro de Educación y Tecnología (CET), a non-governmental organization, was founded in 1981 by four Chileans active in development programs. The goal of CET, which receives partial funding from the Inter-American Foundation, is to give impoverished farmers information about sustainable agriculture alternatives.

The project began with the establishment of an experimental farm close to Santiago. The farm demonstrates intensive family gardening appropriate for subsistence use by both urban and rural poor, and it demonstrates techniques applicable to farmers with larger land holdings.

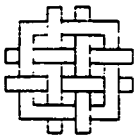
With the encouragement of CET and other Chilean non-governmental groups, professors and students from several universities established the Comisión de Investigación en Agricultura Alternativa (CIAL). The group developed a research program, primarily in organic agriculture, centered on agricultural techniques applicable to the specific social conditions faced by the small farmer. CIAL now is involved in some 75 research programs, and two universities near Santiago offer courses in alternative agriculture.

A total of three demonstration farms have been established and more than 10,000 people visit them annually. Farmers interested in the techniques live at the farms for variable periods of time, learning through direct participation. After training, they act as extension agents in their own communities for the techniques they have learned. Between 600 and 700 farmers, extension agents, and community leaders work briefly at the farms each year, and the methods are believed to reach some 3,000 farmers.

The farming design taught by CET is based on cropping patterns, crops, and management techniques practiced locally. The farms feature highly diversified crops, including vegetables, fruits, and grains as well as the production of typical farm animals. Nitrogen-fixing plants are encouraged in rotations and in association with other crops; manure is applied as fertilizer, and extensive use is made of composting as a primary nutrient source.

CET and CIAL have developed crop rotation schemes that enhance soil fertility and that effectively deal with many insect pest problems. Under optimal conditions, four raised beds, measuring 28 square meters, can produce a monthly vegetable harvest of 82 kilograms. Even if the yields obtained by farmers are only half as good, these plots can provide a surplus of 4 to 12 kilograms per month over the subsistence needs of a family of five.

CET has placed equal emphasis on appropriate technologies, self-help efforts, and social organization. The program has fostered the development of grassroots associations of farmers. These organizations have also become active in community projects, including home construction using designs promoted by CET based on local inexpensive materials that are more likely to withstand earthquakes. The project's success stems from its enhancement of traditional practices, its focus on adaptive use of several technologies rather than a single "best" technology, and its grassroots training efforts.



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Within these broad areas of concern, WRI is currently carrying out the following policy research projects:

I. Program in Forests, Biodiversity and Sustainable Agriculture

- Sustainable Use of Tropical Forests -- Implementing an International Plan of Action, Policy Reforms, and NGO Participation (*Kenton Miller, Peter Hazlewood, William Nagle*)
- Global Action Plan on Biodiversity -- Developing an Integrated Strategy (*Kenton Miller, Walter Reid*)
- Natural Resource Management for Rural Development in Sub-Saharan Africa (*Kenton Miller, Jeffrey Gritzner*)
- Marine Resource Conservation -- Furthering an Adequate System of Governance and Environmental Protection in Antarctica (*Lee Kimball*)

II. Program in Economics and Institutions

- The Economics of Sustainable Development: Economic and Environmental Analyses of Resource Subsidies, Price Controls, and Other Incentives in Agriculture, Forestry, Industry and Energy (*Robert Repetto, Paul Faeth*)
- Natural Resource Accounting -- Valuing Natural Resources and Ecological Services in National Income Accounts and Elsewhere (*Robert Repetto*)
- The U.S. Stake in Global Resource Issues -- Defining U.S. Economic and Political Interests in the Global Environment (*Janet Welsh Brown*)
- Addressing Poverty and Environmental Deterioration -- U.S. Policies and Programs Toward the Third World (*Janet Welsh Brown*)
- International Conservation Financing Project -- Feasibility Study of Concepts for Financing World Conservation (*Robert Repetto, Frederik van Bolhuis, Michael Sweatman, Douglas Fuller*)
- U.S. National Interests in the 1990s -- Toward Shared Management of a Newly Multi-polar World (*Jessica Tuchman Mathews*)

III. Program in Energy, Climate and Pollution

- Greenhouse Effect and Ozone Depletion -- Examining Global Warming, Ozone Layer Destruction, Their Implications and Policy Options (*William Moomaw, Irving Mintzer, Rafe Pomerance, Mark Trexler*)
- Energy Strategy -- Technologies and Policies for Sustainable Energy Use in Industrial and Developing Countries (*William Moomaw, James MacKenzie, Irving Mintzer, Mark Trexler, Paul Hughes*)

IV. Program in Resource and Environmental Information

- World Resources -- A Biennial Report on International Conditions and Trends in Population, Resources, Environment (*Allen Hammond, Mary Paden, Eric Rodenburg, Norbert Henninger*)

Center for International Development and Environment

WRI's Center for International Development and Environment provides services for developing countries in the sustainable management of natural resources. These services include policy advice, institution strengthening, technical program support, training, data management and information. The Center staff has extensive practical experience working with governments and non-governmental organizations (NGOs) to find ecologically sound ways to improve the management of soils, water, forests and other resources.

The Center now carries out programs in three areas:

- Forestry and Land Use – Promoting the sustainable development of forest lands through national forest policy reviews and grassroots participation in development planning (*Thomas Fox, Robert Winterbottom, Bruce Cabarle, Cheryl Cort*)
- NGO Strengthening -- Organizational development services to support professional growth and management capabilities of non-governmental organizations, including documentation of successful local resource management (*Thomas Fox, David Richards, Laurie Greenberg, Peter Veit*)
- Environmental Planning and Management -- Country natural resource assessments and management strategies, emphasis on biodiversity, sustainable agriculture, and data management (*Thomas Fox, Walter Arensberg, Dan Tunstall, Kirk Talbott, Nels Johnson, Janet Abramovitz*)

WRI's President is James Gustave Speth. Mohamed T. El-Ashry is WRI's Vice President for Research and Policy Affairs, and Donna Wise is Director of Policy Affairs.

Representative SCHEUER. Thank you very much, Mr. Reid.

Mr. Michael Whelan, director of the Whelan Group. Please proceed.

STATEMENT OF MICHAEL J. WHELAN, DIRECTOR, THE WHELAN GROUP

Mr. WHELAN. Thank you very much, Congressman.

I am here to report to you today on some strategies, proven strategies for development that work so well that economies using them are now widely being called the economic miracles. Those miracles are, of course, Japan and the four Asian tigers, South Korea, the Republic of China, Taiwan, Singapore, and Hong Kong. Among their achievements: Constant growth rate as high as 8 percent a year, virtually full employment, per capita incomes ranging from $3,000 to $5,000 and even up to $15,000 a year, all from a resource base that is slimmer than most developing nations. The question is, How do they do it?

Last November, some of the best development minds on the Pacific Rim gathered in Taipei to answer that question. Leaders of business and government from Latin America, Central America, and the Caribbean, all told, representatives of about 35 nations came together, meeting for 3 days under the joint sponsorship of the Global Economic Action Institute and the Chung-Hua Institute of the Republic of China.

I was rapporteur for that event, and the findings of this rare gathering of experts are what I will present to you today in digest. I will then address the question of relating those findings to the prime concern of the hearings, the environmental costs.

Early on in the conference, one thing became clear, despite the national differences, reports of fundamentally similar development strategies were emerging. For reporting purposes, these core strategies are condensed here into a list of seven. A more detailed presentation as well as listing the experts who attended the conference are attached to my testimony.

The first strategy was: Commit to a "managed" free-market economy. The experts reported a very much hands-on government role in development in these economies—but with a key difference from socialist state-planned economies. The Pacific Rim governments geared their interventions to creating an environment that would encourage a free-market economy. The common creed was private ownership, competition, entrepreneurial spirit, individual initiative, and economies based on supply and demand.

That is not to say, however, that initial market strategies, which are geared at first to import substitutions, were not protectionist—in Taiwan tariffs ran as high as 151 to 165 percent in the 1950's.

A second strategy that they did focus on was: Give the people a stake in development. An outstanding achievement of these Pacific Rim economies is the creation of a broad-based middle class in which the population at large reaps the benefits of development. In countries where agriculture had a major role, like Japan, South Korea, and Taiwan, a major land reform played a major role in developing this middle class. For one thing, giving a large number of small farmers a real stake in the economy spurred a national com-

mitment to productivity. Beyond agriculture, boosting farmers' income created an important domestic market for products from the emerging industrial sectors. Experts stressed, however, that land reform did not come easy, and it required a strong political will at the top.

The third strategy was: Industrialize from a base of agricultural productivity. While development failures in other emerging economies stemmed from attempting to kick-start those economies directly into industry, the Pacific Rim nations succeeded by building from agriculture. Government rural development programs boosted agriculture productivity dramatically—in Taiwan an average of 10.2 percent during 1946–51. Greater farm productivity freed a labor bank for new industry. And low, stable food prices, made possible by high productivity, reduced pressures on wages and allowed young industries to grow. High productivity also allowed agricultural exports to grow, providing foreign exchange to finance industrialization.

The fourth strategy the experts focused on was: Supply incentives for high savings. These economies are remarkable for their high savings. In Taiwan, the domestic savings rate has averaged over 30 percent since the 1960's, up from 4.5 percent in the early 1950's.

Representative SCHEUER. What percent was that?

Mr. WHELAN. Thirty percent from 4.5 percent in the early 1950's. To encourage savings, government planners exempted savings from taxation and kept real—inflation adjusted—rates positive. Conservative governments spending kept inflation in hand, making savings a sensible alternative. Especially in the early years, the experts believe these savings were a critical source of domestic capital for small and medium-size enterprises.

The fifth strategy reported was developing an educated work force. The planners in these economies recognized early on that productivity rises with the practical education of a population. So they undertook unprecedented expansionist educational programs. In the region as a whole, educational enrollment increased from 263 million in 1960 to 522 million in 1982. While they didn't abandon the academic, the focus was on vocational—especially basic skills for the work force to adapt as industrialization matured. Literacy has as a result become almost universal.

The sixth strategy they focused on was to foster export-oriented expansion. The experts on the whole saw early adoption of an aggressive export expansion policy as perhaps the single most important factor in the successful development of the region. The strategy here was not, however, to dismantle import substitution but to add development of export-oriented industry to it. As early as 1955, Taiwan set rebates on import duty and commodity tax to encourage processing of imported materials for export. This was followed by currency devaluation and a host of export incentives. Similar policies in Korea spurred exports to lead economic growth—dramatically exceeding GNP growth—as early as the beginning of the 1960's.

Such policies allowed market forces to work, encouraging those growth industries that could produce most profitably for world markets. There was a ripple effect for development, first in new

jobs; second, in equalizing income by opening opportunities for workers to rise from low-wage work; and third—in Taiwan, where family-owned small enterprises accounted for more than half of export earnings—in bolstering the high household savings rate.

The seventh and last strategy was leading development with infrastructure. Infrastructural development in these economies has been aggressive. In Taiwan, over the last 35 years, it expanded at a pace that was even faster than the rapid 8.7 percent average GDP growth rate. In the agricultural sector, infrastructural development had already raised the amount of land irrigated there to almost 66 percent by 1960. In the industrial sector, infrastructural investment in power capacity has increased almost 50 times in the 35 years of development. However, a common criterion applied has been that the projects served by the infrastructure should be able to fund the maintenance costs of their infrastructural facilities.

Now to relate all this to the focal concern of the hearings—the environment.

I cannot, unfortunately, report that the conference in Taipei developed an agenda to deal with the environment. From the catalog of strategies reported at the conference, I must report that the environment was conspicuous by its absence.

The reason was not a deliberate attempt to ignore environment, rather the focus of the conference was on reporting what had been done to achieve development, what had worked. Environmental strategy was not part of that. As Jung-Shik Son of Korea's Sungdongku University put it, "We didn't realize the seriousness of environmental issues in the 1960's and 1970's." Chi-Ming Hou, director of international economics for the Chung-Hua Institution, reported the same thing for Taipei. "We neglected environment as an element until now. We didn't pay the social costs," he said.

And the failure to pay social costs has led to varying degrees of environmental degradation. In Korea, for example, factory water sewage has ruined rice paddies and polluted drinking water. In Taipei, where successful development has made it possible for virtually every home to have at least a motor bike, air pollution smothers the city.

There is, however, a rising tide of public consciousness now about the cost of environmental degradation. In Taiwan, Dr. Hou reports, the backlash is coming from the workers themselves, who are now demanding very high environmental standards. And a government environmental unit is now being established.

Because of this new environmental pressure, there has recently been trouble finding acceptable sites for factories in Taiwan, but even now environmental policy isn't strong. In Korea, for instance, while it has an environmental protection agency, its regulations are not enforced strictly, reports Bon Ho Koo, who is the president of the Korea Development Institute.

The question then is, Must the absence of an environmental strategy invalidate the seven-strategy model for successful development that has worked so well in the Pacific Rim? To answer that question, let me quickly run down the list of the seven strategies:

One, commiting to a managed free-market economy,

Two, giving the people a stake in development,

Three, industrializing from a base of agricultural productivity,

Four, encouraging a high savings rate,
Five, developing an educated work force,
Six, fostering export-oriented industry, and
Seven, building a solid infrastructure.

None of these is intrinsically at odds with environment. What is needed, rather, is an eighth strategy—one to address the environmental cost.

The experts connected with the conference believe the time has come for something like that. Dr. Hou recommended that controls be introduced very early in development so that extreme and costly corrective measures don't have to be taken later on. Dr. Son advocated taking a clear-handed cost-benefits approach to the issue, realistically anticipating the price of the environmental degradation which they had not anticipated in the Pacific Rim development strategies. Dr. Koo advised approaching the issue in global framework and developing international agreements calling for subsidies and penalties that would move environmental consciousness into the mainstream of the developing climate.

But even if the governments of the lesser developed countries can be persuaded, either through reasons, international public opinion, or subsidies and penalties, to adopt such strategies and policies, they will need plenty of outside help in designing them and dealing with fundamental questions such as: What is the optimal mix of business regulation and economic incentives to get domestic and foreign firms to look after the environment? And how do you enforce regulation in countries where it may be easier and cheaper to "buy off" regulators and enforcers?

I cannot report solutions from the conference to these questions, but what I hope, nevertheless, has been of value to you in this presentation is an overview of the experience and thinking of the experts who have been involved in a rare and remarkable development success. Their insights, I believe, might give the subcommittee a useful framework for an eighth strategy—an emerging, workable strategy for development with environmental protection and how it might be incubated in that larger scheme. Thank you.

[The following report, together with a list of conference participants, was attached to Mr. Whelan's statement:]

DRAFT REPORT

WORKING PAPER

on

SUCCESSFUL ECONOMIC DEVELOPMENT STRATEGIES

of the

THE PACIFIC RIM NATIONS

An Agenda for Action Devised at Taipei, Republic of China

November 14-16, 1988

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Phoenixes that rose from the ashes of a devastated post-war Asia. Consistent GNP growth rates of as much as 8 percent a year. Per capita incomes ranging from some $3000 to $5000, and even up to $15,000 a year. Virtually full employment. Relative income equity among their populations. Enormous trade surpluses. The envy of the developing world, out of which they've emerged to industrialization from a considerably slimmer natural resource base than many less developed nations. These are the special countries of the Pacific Rim: Japan and the four "Asian Tigers" – Hong Kong, the Republic of China (Taiwan), Singapore, and South Korea.

How did they do it?

Last November, answers to that question became the focus of experts in government, business, banking, and the academic and economic communities from more than 35 nations. They were gathered for three days in Taipei under the joint sponsorship of The Global Economic Action Institute and The Chung-Hua Institution of the Republic of China on Taiwan. The event was noteworthy not just because it drew an impressive international spectrum of expertise in development (see the attached appendix for the list of those present), but also because the gathering had a very pragmatic goal: ACTION – action in the form of identifying practical strategies that the less developed nations might adapt to reach comparable levels of successful development as these enviable Pacific Rim economies.

While the findings of the conference might be applicable in every developing region, the discussions focused particularly on how these strategies could work in Latin America, Central American and the Caribbean. Representatives from these regions took a vocal role in the conference.

SEVEN COMMON STRATEGIES OF SUCCESS

This paper deals with the findings of that conference. One of the most important of them was that, despite individual differences and specific development histories of the five nations, reports of fundamentally similar approaches to development emerged. The reports went, however, beyond descriptions merely of approaches. It quickly became clear that behind the "economic miracles" of Japan, Taiwan, South Korea, Singapore and Hong Kong lay not miracles but careful planning. In a word: strategies. This paper condenses the description of these strategies, for reporting purposes, into a list of seven. The list combines in some cases a group of related strategies under one more generic heading. In capsule, these are the seven:

- **Committing to a "Managed" Free Market Economy**
- **Giving the People a Stake in Development**
- **Industrializing from a Base of Agricultural Productivity**
- **Encouraging a High Savings Rate**
- **Developing an Educated Work Force**
- **Fostering Export-Oriented Industry**
- **Building on a Solid Infrastructure.**

To a certain extent, it must be noted that not all of these "strategies" were, from the start, deliberate. Some of them may have arisen serendipitously, either by trial and error or as a result of groundwork inherited from colonial regimes. The point, however, is not so much how they arose but that they did arise and produced tangible results. They worked.

So the sense of the conference was not that these strategies constitute a fail-safe formula for successful development. Rather, they are best seen as valuable planning ingredients — often ignored in other parts of the developing world – that economic planners should be aware of and should consider in their own development struggles.

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Development Strategy 1: Committing to "Managed" Free-Market Economy.

The government role in all these Pacific Rim economies, as experts on them reported at the conference, has been very much hands on. The question was not whether to intervene in the economic development process, but when and how. However, unlike socialist state planners, these government planners geared there interventions to creating an environment to encourage a free-market economy.

A belief in private ownership and competition; a belief in the entrepreneurial spirit and individual initiative; economies based on the laws of supply and demand – the conference found these themes repeated by each of the experts presenting on the Pacific Rim economies. It became clear that a free-market strategy was the keystone for development in each of these five nations. This strategy differs markedly from that found in some other parts of the developing world, where state-run enterprises and an outright aversion to free markets have been the order of the day, especially in nations emerging from colonial rule.

This is not to say that Japan and the Asian Tigers launched development with completely open markets. In fact, their common initial market strategy was protectionist, geared to fostering import substitution – in order to build a domestic manufacturing base in their war-devastated economies. This initial strategy entailed high tariffs (in Taiwan, for example, as much as 151-165 percent in the 1950s), strict import licensing, multiple exchange rates and exchange controls on luxury goods. However, these controls were seen from the start as temporary. The strategy was to start moving away, at an early stage, from tight controls, subsidies, tariffs and quotas. Singapore and Hong Kong were especially quick to do this. Liberalizing also included opening doors to foreign investment, pressing domestic producers to improve their own productivity under the stimulus of competition.

In contrast to many other developing nations, where vested interests have repeatedly prevented the implementation of such policies, these Pacific Rim nations were able to succeed, a testimony in part to the far-sightedness of their leaders. At the same time, the ability of government and businesses to work alongside each other rather than in adversarial roles was a complementary and significant factor in bringing the "planned" free-market economy to fruition.

Development Strategy 2: Giving the People a Stake in Development

Hand in glove with a "managed" free-market commitment in these economies was the good sense of giving the people a stake in the process of development. A key to this strategy was a policy commitment to achieving equitable income distribution. Unlike other nations where development has been thwarted by concentrations of wealth among a small group of elite, the Pacific Rim economies have developed a broad-based middle class, in which the population at large reaps the benefits of development.

In those nations -- Japan, South Korea, and Taiwan -- where agriculture accounted for a significant segment of the economy, a thoroughgoing land reform played a critical part in setting the foundation for equitable income distribution.

In Taiwan land reform was undertaken through a three-part strategy that entailed: 1) a reduction in rent to no more than 37.5 percent of the main crop; 2) sale of public land at low prices to tenants, farm laborers and part-owner farmers; and 3) a "land-to-the-tiller" program that limited land holdings to 2.9 hectares per family.

Income equity in turn contributed to the political stability needed to carry out successful development. Also, by giving a large number of small farmers a real stake in the economy, land reform played an important role in mobilizing a national commitment to productivity that has become a hallmark of these Pacific Rim nations. Not only that, by boosting farmer's incomes, land reform also created an important domestic market for the products of the emerging industrial sectors.

Experts on these economies stressed, though, that land reform did not come easy. Opposition from large landholders posed, as in other developing nations, a substantial threat to these programs. The difference in the Pacific Rim nations was that in each case there was a strong political will -- at the highest levels of government -- to carry out the programs. Taiwan's success here was not, however, only a matter of political will. It also entailed an imaginative strategy of compensating the former large landholders with a stake in the emerging industrial sector by making industrial bonds part of the payment for their land.

Furthermore it was pointed out that land policy must be flexible or it can backfire in later stages of development. This has been the case, for instance, in Japan, where rigid adherence to limits on landholdings to small plots, while initially egalitarian, subsequently made it impossible to take advantage of technological developments, most of which required larger units of land to be cost-effective. This rigidity of policy then became an obstacle to agricultural productivity and a constraint to domestic agricultural policy reform consistent with an open trading economy.

Development Strategy 3: Industrializing from a Base of Agricultural Productivity

The development pattern of Japan, Taiwan and South Korea began with strong policies to boost agricultural productivity -- before attempting any large scale industrialization. Government played a crucial role here by integrated rural development programs. Such programs included introducing new crops, improving irrigation and drainage, strengthening and coordinating rural organizations, disseminating new technology and new marketing and distribution strategies.

With such programs, agricultural productivity rose dramatically in the early stages of development. In Taiwan, it climbed an average 10.2 percent in 1946-1951 and it continued growing at about half that rate through 1970. Such boosts in productivity made possible a major realignment of these economies, ultimately shifting their weight from agriculture to industry. Greater productivity on the farm released a bank of labor that could be tapped by the new industrial sector. At the same time, high agricultural productivity kept food prices low. As the labor force shifted from agriculture to industry, the low food prices translated into reduced pressure on wages, since food is the greatest single item in the budget of households in developing nations. A stable, relatively low wage structure allowed young industries to grow. Furthermore, with high farm output, agricultural exports could grow. These in turn provided an important source of foreign exchange to finance the imports needed for industrialization.

Overall, agriculture was used to fuel industrialization. This strategy contrasts sharply with the premature industrialization that has fared so poorly in many other developing nations. There, planners in their rush to industrialize, frequently did so by draining the agricultural sector through high taxes, price controls, forced sales to marketing boards, and other ill-conceived mechanisms. The result -- stagnant or declining productivity in the agricultural sector, with little progress in the industrial sector.

Development Strategy 4: Encouraging a High Savings Rate

The remarkably high savings rates of these economies is one of their most characteristic features. The domestic savings rate of Taiwan, for example, has averaged over 30 percent since the 1960s. (That's more than six times the current domestic savings rate in the U.S.) What's equally remarkable is the dramatic rise in the savings rate over the years of development, from 4.5 percent in the early 1950s.

The growing savings, especially in the early years, were a critical source of domestic capital. They became a financial lifeblood to the entrepreneurs in smaller and medium-sized businesses that could not easily borrow from banks in these economies. This store of savings also made industrialization possible without heavy dependence on external debt. (Korea is the exception here; it borrowed heavily to finance large enterprises and is now the only one of these NICs with a high foreign debt and a history of inflation. However, by the early part of 1989, Korea will be a net capital exporter.)

To encourage savings, government planners designed fiscal and monetary policies to make savings attractive. These included a two-pronged approach. First, interest earned on savings was made exempt from taxation. While terms of this exemption were later tightened somewhat in Taiwan, it is still estimated that some 90 percent of its taxpayers take advantage of such an exemption. Second, real (inflation adjusted) interest rates were kept positive.

In addition to direct strategies aimed to promote savings, other development strategies followed in these economies also indirectly encouraged savings. For example, policies of conservative government spending and concentration on boosting agricultural output generated a relative price stability that, in addition to tax exemptions and realistic interest rates, also made a savings account a sensible and attractive choice for a household. This is reflected in the savings statistics for households. In Taiwan, for instance, nearly 60 percent of total savings have, since 1961, been accounted for by personal or household savings.

Development strategy alone may not, however, explain these remarkable savings ratios. Another less measurable factor that conference participants speculated on was the cultural factor. In each of these Pacific Rim nations, the conference participants noted, traditions of frugality and thriftiness have a long history. Esteem for them is integral to the Confucian mindset shared by all these cultures.

While high savings rates can have very tangible development benefits, planners must be wary to key them to the total economic picture. Otherwise, as development matures they can be the source of monetary inflation, especially if foreign exchange controls prevent excess savings seeking external forms of investment. This has been the experience of Taiwan in recent years where stock market and land prices have skyrocketed and banks have reached the point of charging fees to hold savings deposits.

Development Strategy 5: Developing an Educated Work Force

The planners in these Pacific Rim nations recognized early on that productivity rises with the practical education of a population. If their economies were to move from an agricultural to an industrial base, a literate, educated work force able to meet the skilled manpower needs of industrialization would be essential. To meet this challenge, a common strategy in these nations was to undertake unprecedented expansionist educational programs -- dramatically oriented toward mass education. Reflecting this drive, growth in educational enrollment increased phenomenally in the region as a whole -- from 263 million in 1960 to 522 million in 1982.

A distinctive feature of these national educational strategies has been their realism. Their focus, while not abandoning the academic, was extended to the vocational. The idea was to avoid the mismatch -- a problem in other developing nations -- between school-leavers trained in a purely academic curricula, and the needs of the work-place where they must make a livelihood. To achieve this expanded vocational focus, Singapore, for instance, created in 1968 a National Industrial Training Council, manned by high-level government ministers, to oversee development of all vocational and technical education. By 1972, the number of vocational institutions in the country had tripled. An additional facet of this strategy in Singapore has been to foster employer-based skills training programs. To do this, the government developed in 1979 a Skills Development Fund, financed by a 4 percent tax, later reduced to 1 percent, paid by employers on all employees earnings less than $750 a month. Under this scheme employers were encouraged to enhance their workers' skills through in-plant and general upgrading training.

Overall in the region, the stress was on providing not just narrow technical skills but also the basic skills needed to allow the work force to adapt as industrialization matured. This is reflected in the growth of education enrollments -- in primary education, up 61 percent, and in secondary education, up 35 percent, between 1960 and 1982. As a result, literacy became almost universal. In Taiwan, the literacy rate climbed from less than half (45 percent of the population 6 years and older) in 1946 to 92 percent in 1986.

Development Strategy 6: Fostering Export-Oriented Industry

The early adoption of an aggressive export expansion policy was perhaps the most important single factor in the impressive development of these Pacific Rim economies. By setting their growth objectives beyond the limits of their initial import-substitution strategies, these nations unleashed the power of their productive resources -- especially of their labor -- into accelerated growth. The strategy here, however, was not to dismantle import substitution but to add development of export-oriented industry to it. As early as 1955, Taiwan set rebates on import duty and commodity tax to encourage processing of imported materials for exports. This was followed by a currency devaluation and a host of incentives for export industries, such as exemption from stamp taxes, a lower taxable income base, special low interest loans, direct subsidies and government financed export promotion facilities and market research. Another facet in the strategy was the creation of tax and duty-free export processing zones.

The results of these policies was the spectacular export growth for which the Pacific Rim economies have become famous. In Taiwan the total value of merchandise exports in 1952 was US$116 million. By 1986 it was some $39 billion. In Korea exports were leading economic growth -- dramatically exceeding GNP growth rate -- as early as the beginning of the 1960s. A drastic depreciation of the won and other export incentives in Korea resulted in a dramatic growth of labor-intensive, light manufacturing industries as exporters. During Korea's first Five-Year Economic Development Plan (1962-1966), exports quadrupled and the value of imports doubled. Export value quadrupled again in the next five years. Fueled by export expansion, the economy maintained a hefty average growth rate of 8.7 percent (6.9 percent in per capita) over a period of 35 years.

The real significance of export expansion policies was that they allowed market forces to work, encouraging growth of those industries which, by virtue of comparative advantage, could produce most profitably for world markets. In Taiwan, export oriented expansion policies thus led to structural change and industrial upgrading, from concentration in sugar and rice as leading exports in 1952, to textile products in 1966, to electrical machinery and apparatus by 1986.

Export-expansion policies had a ripple effect of other benefits too, feeding development in several ways at the same time. First, export expansion created an abundance of new jobs -- accounting for some 54 percent of manufacturing employment in Taiwan -- and virtually continuous full employment. Secondly, export expansion reduced income inequality by expanding labor-intensive industries that increased demand for unskilled workers who would otherwise have been locked into agriculture and other low-wage work. Thirdly, in economies like Taiwan's, where the output of small and medium size enterprises, often family-owned, accounted for more than half of export earnings, export expansion also bolstered the high household savings ratio.

In framing their strategies in this area, what distinguished these countries from, for instance, the Philippines or many Latin American countries -- all markedly slower in surrendering the protections on their import substituting industries -- was timing. The governments of these Pacific Rim economies knew when to make the shift to export-led growth and to search for larger markets abroad. Furthermore they were able to act in accordance with this knowledge.

Development Strategy 7: Building on a Solid Infrastructure

While there has been ongoing debate as to whether infrastructural development should lead or follow in the industrialization process, in Taiwan it has been in the forefront. Over Taiwan's three and half decades of development, investment in infrastructure expanded at an even faster pace than the rapid 8.7 percent GDP growth rate. Infrastucture's share in GDP rose from 5.1 percent in 1952 to 8.9 percent in 1966.

Consistent with its strategy of building development from a strong agricultural base, infrastructural investment raised the amount of irrigated and drained land to almost 66 percent of arable land in 1960. This is considered one important reason why agricultural production grew continuously -- unlike in other developing nations where lack of attention to agricultural infrastructure has often created bottlenecks to economic development.

In the industrial sector, infrastructural investment in power was aggressive, increasing power capacity almost 50 times in 35 years of development. This infrastructural development not only facilitated industrialization; at the same time, it improved living standards, a key goal of economic development. By 1976, 100 percent of the population had electric service.

However, investment in infrastructure has been made carefully, based on costs and benefits. The common criteria has been that projects served by the infrastructure should to be able to fund the

maintenance costs of their infrastructural facilities. Excessive subsidy pricing has therefore been avoided. In Singapore, for example, while residential electric rates are set to be within reach of a family of four, rates for residential usage of air conditioning are set at a premium.

CONDITIONS THAT FOSTERED THE SUCCESS OF THESE STRATEGIES

Strategies are practical, expeditious ways to achieve goals. As such, the seven common development strategies pass the test: they produced impressive successes in development. However, throughout the conference, representatives of these successful economies also pointed to other, less controllable factors that, in their views, played important roles in the economic successes of these Pacific Rim economies. Three of them stand out particularly:

- **Political stability**
- **Deeply ingrained work ethic**
- **Commitment by the political and economic elite to the common good**

These factors are not themselves strategies; rather they are conditions. As such, they are a harder to control, though, the conference participants felt, they can be nurtured by governments that recognize their value in fostering successful development.

* * * * * *

Condition 1: Political Stability

Conference participants pointed out that in addition to their common development strategies, Japan, South Korea, Taiwan, Hong Kong and Singapore all share a relatively stable political climate -- unlike the volatile political climates of many Central and Latin American nations. Experts at the conference saw this political stability as critically important to the success of the development strategies. It has to be admitted, however, that the way political stability was maintained in some of these economies -- until recently by martial law in South Korea and Taiwan and by the preeminence of one-party in Singapore -- was less than ideal from a standard Western democratic viewpoint.

Participants pointed out that the ideal would be for political stability to grow out of strong leadership, with a good managerial sense, based on a clear democratic mandate. They noted that political stability without a democratic base and a free-enterprise economic system has a poor track record -- as illustrated by the economic stagnation of the Communist block nations with their long history of political stability.

Condition 2: A Deeply Ingrained Work Ethic

Representatives of all of these Pacific Rim nations pointed to the tradition of hard work and enterprise that is ingrained in all the region's cultures. A 1986 Chinese University of Hong Kong study of a cross section of the Hong Kong population illustrates this mindset. Of those surveyed, more than 80 percent reported that they worked more than eight hours a day, despite the steady improvement of their livelihood. Only 11 percent said they would stop working if they were suddenly free of financial pressures. The study reported also that not only did Hong Kongers work hard, they also studied hard. About 73 percent of them were not satisfied with their educational attainments and would like to improve on them. They expected more of their children, the report found. Nearly 60 percent hoped that their sons and daughters would receive university education.

Some conference participants pointed to the Confucian culture of the region as the source of this work ethic. They also observed that the Confucian tradition of thrift and frugality was consistent with the high savings rate that emerged as these economies grew. However, it was also noted that other relatively

successful developing economies, such as Thailand and Cote d'Ivoire, have shown similar hard-working, entrepreneurial spirit – with no little or no Confucian tradition. The sense of the conference was that, all things considered, the philosophical tradition of the developing nation is not the issue. Industriousness, willingness to work hard, frugality, and thrift are not the property of any one culture. They can be fostered in any culture. The lesson to be learned is that these qualities have to be fostered. Development will have hard going without them.

Condition 3: Commitment of the Elite to the Public Good

Participants from Central and Latin America took the initiative in pointing out what they considered an important difference between the leadership of their regions and that of these Pacific Rim nations. The Central and Latin American elite, they observed, are prone more to rhetoric than action. By contrast, the culture of the Pacific Rim places a strong social obligation on the elite to serve the public good. This may account for the fact that in the Pacific Rim nations, for the most part government did not align with narrow interest groups. As a result, rent-seeking by vested interests was not tolerated. Central and Latin American participants were vocal in their emphasis on the need for their elite to adopt an equally group conscious ethic.

THE STRATEGIES OF SUCCESS: ARE THEY TRANSFERRABLE?

In a word, yes. That was the consensus of the conference participants, especially members from Central America, Latin America, and the Caribbean, many of whose economies are at the same stage that the Pacific Rim economies were thirty years ago. But conference participants were careful to emphasize that they were not recommending a packaged plan. The point was that, as the abundant evidence presented in the three days showed, the success of development in the Pacific Rim was not a matter of good luck. It was a matter of active government planning and that planning consisted of specific, common strategies. The fact that they are proven makes them valuable models for the rest of the developing world. Not models to be adapted whole, the conference stressed, but selectively.

And while successful, these strategies were not perfect. They entailed trade-offs. A significant one has been in environmental quality. The headlong drive to industrialize has spurned serious urban pollution problems. Cleanup of environment is now beginning to emerge as a priority, in some cases, over further development. Another cost, as noted above, has been in limits on social freedoms. And in the view of some experts at the conference, export-expansion policy has gone overboard and import-substitution policy has had harmful effects along with its benefits. Evidence of excess in the application of these strategies can be seen in the huge trade surpluses in the region, notably the pile-up in Taiwan foreign exchange reserves, which had shot up to more than $74 billion or 61 percent of GNP in 1988. These and similar costs must be weighed carefully in adopting and adapting the strategies; they need not be assumed to be inevitable by-products of development.

Another key factor, not discussed formally in the presentations but mentioned by conference participants informally, was the substantial U.S. aid that these countries had received in the 1950s' and 1960s. It's not likely to be there again on such a large scale for currently developing nations. However, the Pacific Rim nations themselves are moving in to fill the gap. Japan is, in fact, becoming the giant in Overseas Development Assistance (ODA). In 1987 Japan's ODA budget exceeded $7.45 billion, and by 1989 it's expected to surpass the US aid budget. Taiwan is following suit. In 1988 it created its International Economic Cooperation Fund, which is slated to be a $1 billion fund to help developing countries and promote trade with them.

One of the conference participants from Latin America summed up the lessons learned in the Pacific Rim, by proposing a "good sense guide" for leaders and economic planners, one that calls for: a sense of balance (between free market and government intervention); a sense of direction (a long-term perspective); a sense of decision (taking strong leadership action to adapt strategies promptly as conditions change); a sense of permanence (committing to continuity in policy); and a sense of integrity.

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Representative SCHEUER. Thank you very much for your very provocative testimony, Mr. Whelan. We hope that environment will be an intrinsic element in developing development strategy, a very intrinsic element right at the central nervous system and not an eighth add on. I am sure that is what you hope, too.

Mr. WHELAN. As I said, these people, it was not intrinsic. You could sense it. The discussions never really focused on it. It's an afterthought that now has to become much more integrated.

Representative SCHEUER. Let me express my pleasure that we have been joined today by Senator Al Gore who is a leading environment voice in the Congress. He is an active and leading member of the Joint Economic Committee under whose auspices this hearing is taking place, and he and I have worked together to organize a global parliamentary organization on the environment. It's called GLOBE, Global Legislators Organization for Balanced Environment.

So it is a great pleasure to have him here.

As soon as Mr. Leonard Robinson finishes his testimony, I am going to call upon Senator Gore to make his opening statement. Then we will go into questions, OK?

I have been blessed by a close and continuing counsel and advice from the two men at either end of this table.

Mr. Tom Lovejoy has been a great friend and counselor. He played a major role in putting together this bill on biodiversity, in which we hope the Smithsonian will play a continuing role.

I met Leonard Robinson when he was a development officer in Ghana about 13 years ago in 1976. Then about a year later, we formed the Select Committee on Population. I called up Mr. Robinson in Ghana. I think I said something like, you have 48 hours to get over here and play a major role in the Select Committee on Population. He did.

So I am very, very happy to introduce you, Leonard. Please take 10 minutes and chat with us informally and give us your wisdom about sustainable development and how we accomplish it.

STATEMENT OF LEONARD H. ROBINSON, JR., PRESIDENT, AFRICAN DEVELOPMENT FOUNDATION

Mr. ROBINSON. Thank you very much, Congressman. It is a real personal and professional pleasure for me to testify before you and the subcommittee this morning. The African Development Foundation, established by Congress in 1980 and operationalized in 1984, has been working directly and exclusively with indigenous, nongovernmental organizations in Africa for 5 years. To date, the Foundation has funded over 200 development projects and grassroots research initiatives in 25 African countries. During this relatively short period of time, we have been able to test out the tenets of ADF's enabling legislation—that delivering development assistance, which is community directed and supportive of bottom-up approaches, will increase the ability of African countries to take advantage of larger economic development assistance programs over the long term.

Development and the adaptation of new technologies is a slow and arduous process. As foreign aid donors, westerners tend to look

for quick fixes to the needs of local people. Sometimes we negate the fact that the development pace must be determined by the community, in order for initiatives to be accepted, realized, and sustained.

Life demands on poor people do not take the form of projects that are fulfilled in specified, Western-style, timeframes. For disadvantaged Africans, life consists of the need to survive in a generally harsh environment. Daily priorities are determined by their access to food, water, shelter, and income. We believe that in order for disadvantaged people to improve their economic and physical well-being, development resources, along with donor confidence and trust, must be placed directly in the hands of indigenous community groups and indigenous development service providers. Based on the Foundation's documented experience, this approach also leads to sustainable, self-reliant development. In fact, the Office of Technology Assessment, in reporting on its evaluation of ADF's program, released in June 1988, reported that of the 12 projects assessed in 6 countries, 10 of these projects possessed a high to moderate potential for sustainability.

One of the most critical development issues confronting African nations to date is how to generate jobs and earnings for the vast majority of their populations. With annual population growth rates averaging 3.2 percent, Africa's population will double in 20 to 25 years, making employment and productivity perhaps the most critical economic challenge facing the continent. The Foundation's experience has shown that development resources targeted to increase the comparative advantage of rural people have the potential to help solve this critical problem. Rural cottage industries which focus on import substitution or value-added productivity are at the cornerstone of successful rural development programs.

For example, the Youth Brigade movement in Botswana, supported by the Foundation, increases vocational skills in cement brickmaking, carpentry, and in metalworks, and has enabled many youths to become economically productive. The Youth Brigades have begun to eliminate the need for their respective communities to import building materials and skilled labor for construction purposes.

Also critical to addressing Africa's underemployment problem is the need for African governments and others to recognize the economic strength and viability of informal sector enterprises. In light of the fact that structural adjustment measures frequently threaten to exacerbate the already fragile economic base of rural Africa, grossly affecting women and children, in particular, it is particularly important for donors to look for innovative mechanisms to stimulate the cash economy available to informal entrepreneurs—traders, market women and cooperatives.

One of the greatest gaps in development aid occurs in the development sectors. In most African countries, informal sector entrepreneurs possess some basic production skills; however, they lack the technology and means to appropriately finish and market their products. These informal entrepreneurs need access to a cadre of local development service provider organizations to either provide them additional skill training, business management training, and most importantly, access to equipment for production purposes.

ADF is just beginning to tap into this critical sector; however, we believe that these local professional development service providers are essential in order for informal entrepreneurs to improve their economic viability and sustainability. We believe that there are two essential components for community development success. First, there must already exist within the community some basic project-related skills in order for development goals to be achieved. These skills can range from bookkeeping, conception of ideas, identification of problems and solutions, and vocational skills such as gardening, sewing, et cetera.

Second, and most importantly, the community must clearly recognize that the end product from a development initiative can be the solution to their development needs. There are many examples of successful projects that I could give you, Congressman and members of the subcommittee, but let me focus on one project as an example. ADF provided a grant of $14,000 to the Young Women's Christian Association Council of Zambia to set up a revolving loan fund managed by the Lusaka Branch of the YWCA, to provide loans to individual weavers in Desai, an area on the outskirts of Lusaka, Zambia. Credit provided to the weavers has enabled them to purchase looms and other weaving equipment and to pay rent for their workshop space. Loans totaling $370 were provided to five groups of women, each group consisting of three, to purchase looms, spinning wheels, other equipment and raw materials.

Loans are to be paid back over a period of 5 years at 18 percent interest. Sixty percent of the women have no formal education and the majority are married with each having between two and eight children. Their ages range from 20 to 53 years of age. Prior to receiving the loan from the YWCA in 1985, the women had received training in weaving from the YWCA. In the recent evaluation of the project, the YWCA reported a 99 percent repayment rate on the loans provided to the Desai weavers. In addition, the women have reported their income per month prior to receiving a loan was $25, but after starting their weaving enterprises, they are now earning $60 per month.

Some of the women reported monthly income as high as $80 per month. The women are producing largely carpets, table mats and marketing them locally in Lusaka. The carpets sell for about $25 and the table mats for approximately 80 cents. The evaluation indicates that from April 1986 to April 1988 the total value of products produced by the women was $22,000. Through this project, the women have not only been able to increase their monthly income, they have also been able to make some noticeable home improvements. Some of the women have been able to purchase beds, additional household cooking supplies and have been able to make modest additions to their homes, including the addition of piped water. Most importantly, the women have been able to afford the fee to access the main water supply in bringing in the piping system, which actually affords them access to clean drinking water.

Congressman, I would like to point out that supporting local self-directed development initiatives is not without its challenges. We have experienced difficulties in transferring funds to African banks, identifying appropriate technical assistance and in facilitating the transfer of skills to project participants. However, the

people of Africa deserve every opportunity to participate in development initiatives which directly impact their economic well-being. The American people deserve the greatest return on their dollars invested in foreign aid. Thus, we are convinced that projects which, one, provide the opportunity for the poor to be directly engaged in their own development and, two, which involve African experts as technical assistance providers to the poor, plus the utilization of African expertise in accounting the project evaluation, affords the American taxpayer the greatest economic return on dollars invested.

Through experience we know that the infrastructure exists at the village level in Africa to absorb direct funding assistance. We know that the commitment exists in the rural areas to implement development initiatives and to ensure the success of initiatives undertaken. We now know that the knowledge base exists in Africa to carry out village-based needs assessments, and we also know that African villagers are willing to receive help from African development experts. ADF also knows that African governments are not opposed to allowing Africa's poor at the village level to participate in an autonomous fashion in their own development process.

In this regard, we also know that $250,000 or $50,000 or $20,000, strategically placed, renders a great result than a $10 million project, ill conceived at the macroeconomic level in anticipation that through the maze of bureaucracy the disadvantaged will benefit through the so-called trickle-down effect.

In closing, Congressman Scheuer and members of the subcommittee, I respectfully urge you to continue your support for development initiatives which create and stimulate growth at the base of African society. Thank you.

Representative SCHEUER. Thank you very much Mr. Robinson.

It is now my pleasure to recognize Senator Gore for an opening statement and for any questions that he may wish to ask of the witnesses.

OPENING STATEMENT OF SENATOR GORE

Senator GORE. Thank you for your courtesy, Congressman. I will be brief. I apologize for not being able to stay as long as I would like to stay for this hearing. I have been reading the statements that I missed because they were presented earlier, and I assure you that I will go over them carefully. I think that this series of hearings, Congressman Scheuer, represents probably the most important set of hearings the Joint Economic Committee will do in this Congress, and I want to congratulate you for your leadership in conceiving of this focus and in pursuing it in a very determined way.

You and I have worked together on these matters for a long time, and I recall so well when you and I cochaired the first hearings on the global warming that were ever held in the Congress almost 9 years ago. I have had the great pleasure of working with you since that time.

I want to note the presence on this panel of Tom Lovejoy. Indeed, all of these witnesses are quite distinguished. I have a personal friendship with Mr. Lovejoy. We went to the Amazon rain forest

together earlier this year, and of course, as the author of the debt-for-nature idea he has injected into this debate on sustainable development one of the few concrete proposals that has captured the imagination of many around the world.

Others among our witnesses have been extremely important participants in the debate over how to solve this underlying problem. I will put into the record my full opening statement, but let me just summarize it by my saying that we are, as these witnesses are acutely aware, at a turning point in world history. The human species has suddenly entered into a brandnew relationship with the planet Earth for three reasons.

First, because of the astounding growth in population.

Second, because first the industrial, then the scientific and technological revolutions have magnified the impact of each of the additional billions on the environment.

And third, because we tolerate an unbelievable amount of environmental vandalism on a global scale. All three of these elements have combined to produce an unsustainable relationship between our civilization and the Earth.

When we are confronted with the survival needs of the new hundreds of millions in the Third World, we recognize the necessity of continuing development, but we must have development that is compatible with environmental protection, and we can no longer afford to kid ourselves about what that means. As Mr. Lovejoy said in his remarks, the sustainable part of the definition refers to the environment. Indeed, we cannot negotiate with the environment. We must respect its constraints.

Moreover, we should, in my view, recognize the dangers of what the Greeks called "hubris." We can develop an overweening pride in our ability to use science and technology to make new things and to accomplish new goals, and in the process, we can fool ourselves about the degree of our omnipotence and the degree of our ability to take into account the damage that we are doing to the environment.

Economics itself, if seen as a tool of civilization, as a technology for allocating the resources and designing the pattern of development, can bring with it a kind of hubris. We can pretend that we have an ability with neoclassical economics to calculate, measure, and take into account environmental damage when, in fact, the complexity of the systems with which we are interfering is beyond our current ability to understand. If we intervene in a complex ecosystem with 50 different species relating in complex ways, and then we calculate the cost of destroying one of those species without ever taking into account the interrelationship it has with the patterns of the other 49, then we are simply kidding ourselves if we assign a cost to the elimination of that one species, because we don't understand enough to justify that kind of activity.

I believe, therefore, it makes sense to err on the side of protecting the environment when these conflicts come clearly into focus, particularly when we are destroying one football field's worth of rain forest every second in the world today, one Tennessee's worth every year, with the loss of an average, estimated 100 species per day.

I proposed, Congressman Scheuer, a strategic environment initiative. When I proposed it, I noted on the floor of the Senate that 1 of the 10 titles was based on your work in preserving biological diversity, and I have tried to redefine this issue in national security terms. I believe it should be seen as a national security issue, because if one assumes that the nuclear arms race is now being taken in a different direction, and I hope it is, then this is by all odds the most serious challenge to our nation's security and the security of other nations in the world that we face.

I appreciate your courtesy in allowing me to make my statement at this time, Congressman Scheuer, and your offer to let me go first on the questions.

I will just say that at this point I will turn it back to you with my thanks for your courtesy, again, with an apology to the witnesses for not being able to stay, but I look forward to reviewing the interchanges with the Congressman.

[The written opening statement of Senator Gore follows:]

WRITTEN OPENING STATEMENT OF SENATOR GORE

Mr. Chairman, I want to thank you for holding this hearing this morning. And I want to commend you and all of our witnesses today for their tireless efforts on behalf of an issue that citizens of all nations realize to be the most important challenge that we will face in the coming decade: attaining sustainable economic development, and preserving a healthy environment for the generations to come.

The threat to the world's environment -- brought on in part by nonsustainable resource depletion -- is a global phenomenon that touches almost every part of the web of life on our planet. For the every nation, and for the world as a whole, this crisis

has implications not only for our global environment, but also for the national security of every nation.

In the developing world -- where more than 90 percent of all the people in the world will be born in coming decades -- growing populations and debts intensify the pressures on natural resources every day. Deserts expand while the forests -- home to such a wide range of life forms -- continue to retreat. Hundreds of millions of people in the Third World live in abject poverty, and end up destroying the resources on which their future depends because no alternative is open to them.

Under these grave circumstances, we have to begin examining the fundamental relationships that exist between the present and the future. No longer can the need for long-term solutions be traded off in favor of short-term gains. We have to look past the here and now, past our own generation and that of our children, to the future that we are denying those decades and centuries down the line. Only by finding the means to develop the economies of nations around the world on a sustainable basis will we preserve that future.

While I am not a supporter of former President Reagan's military Strategic Defense Initiative, I and other opponents recognize that this effort has at least been successful at

drawing together previously disconnected programs, in stimulating the development of new technologies, and in forcing upon us a new wave of intense new analysis of subjects previously thought to have been exhausted.

We need the same kind of focus and intensity, and similar levels of funding, to deal comprehensively with attaining the goal of sustainable development. We need a Strategic Environment Initiative. I have introduced such a measure in the United States Senate.

Such an effort should be carried out by every industrialized nation in the world. In each major sector of economic activity -- energy, agriculture, manufacturing, and transportation -- a Strategic Environment Initiative must identify and then spread sets of increasingly effective new technologies: some that are already well in hand; some that need further work, though well understood in principle; and some that are revolutionary ideas whose very existence is now a matter of speculation.

In addition to finding applications in our own nations, we in the developed world must organize ourselves with international lending institutions, in order to finance the export of technologies developed under such a Strategic Environment

Initiative to the Third World, and to train a core of environmental planners and technicians around the world.

The spirit of global cooperation that drives the participants in this hearing is the same spirit that will drive the global movement to attain sustainable economic development and preserve the environment. The problems we face are too big for any one nation -- no matter how powerful -- to solve on its own. But no problem is too big for the collective efforts of dedicated men and women working together.

I look forward to hearing the testimonies of our witnesses.

Representative SCHEUER. Thank you. We all know how busy you are and the demands on your time, and we are delighted that you came to join us this morning.

Let me ask the whole panel, do you agree with Mr. Reid's comment as to the importance of including natural resource depletion in the national accounting framework, including projected resource depletion in the analysis of all loans, possibly grants, by AIDS, by the World Bank, by the regional development banks, that we should, in effect, engage in life cycle accounting, not just the beginning costs, but the costs over the life of the project, including costs to the environment.

Mr. Lovejoy, would you respond to that?

Mr. LOVEJOY. I recently had an interesting discussion on the issue of soil erosion and what was considered to be a reasonable rate of soil erosion. In the discussion, a point was made that what I was really suggesting was natural resources should be given a lesser discount rate than other resources. This was considered a rather outrageous suggestion. The more I think about it, the more I think that the discount rates applied to natural resources in national accounting through project accounts or whatever should relate to the degree of their renewability. So something that takes a very, very long time to renew should have a benevolent low discount rate compared to other kinds of resources. So I couldn't agree more.

Representative SCHEUER. Talk about the long time it takes to renew slash and burn of a tropical forest. What kind of a timeframe were you faced with? Is the vain hope that that forest will renourish and replace itself over a period of time, if there is hope for that, what is the timeframe?

Mr. LOVEJOY. There are two parts to the answer. One is, you can get an Amazon forest to grow back where there has been extensive deforestation, but it will require very labor-intensive activities. What you may not get back, and here's the second part of the answer, are any of the species that happen to have been driven to extinction. So in that case, you can't apply a discount rate at all.

Representative SCHEUER. The pity of it is, that we are driving species to extinction both around the world and in the Amazon and I suppose in Indonesia, Costa Rica, Guatemala, and in our own country, species that we haven't even identified yet.

To me that is almost the ultimate inanity, that a nation where we get up to 40 percent of all our drugs from plant life, that we are destroying the plant life that we haven't identified.

What is the timeframe for replenishing a natural forest?

Mr. LOVEJOY. You mean if all the species are present to play with?

Representative SCHEUER. What is the timeframe from the time that a farmer has done his slash and burn act and has hung around for a year or two trying to eke out a painful living. He's really destroyed the land. It's left after the slash and burn for the purposes of equal grazing or raising crops. The point where he abandons that piece of land to go on to another piece of land and engage in the same slash and burn practice, how long will it take to recover and resume its original role as tropical forestland?

Mr. LOVEJOY. If you're only dealing with a tiny little clearing which is less and less frequently the case, but a tiny clearing, the forest will repair itself, and you will get something back that is reasonably mature within, say, 100 to 150 years. If you have a big clearing, of thousands of hectares, we have no idea how long it will take, but the suggestion would be, I think, that is going to be on the order of several hundred years.

Representative SCHEUER. Any other members of the panel on the question of natural resources depletion?

Mr. LIPTON. I would like just to raise a question, really, in your mind about this question of slash and burn. I am always very concerned with blaming the victim. We should not blame the victim for things that the victim is forced to do.

Also, slash and burn is in many parts of West Africa still leaving 25 to 30 years for the forestlands to recuperate. As far as one can see, given the sorts of forest cover that are being engaged and the rather low intensity of cultivation, this looks like a stable system.

We know very well that population growth goes on at 3 percent a year and the time will come where this ceases and ceases quite sharply, to be a stable system. But there are many communities in the world who have been practicing slash and burn for many hundreds of years without degrading their environments. What happens is that upon such communities are imposed very rapid population growth plus new techniques and new shortages. Then a system, which was perfectly stable and sustainable, sharply ceases to be stable and sustainable. It is not that slash and burn is in itself always a bad way of farming.

Representative SCHEUER. I guess you could say over the millennia, our population, even the developing world, never increased more than 1 percent, and I am talking about 1 percent per century, not 1 percent per year. There was equilibrium. A very high rate of birth and high rate of death. Nature achieved that equilibrium, so there weren't population pressures to expand. There might have been agricultural reasons to engage in slash and burn, but there wasn't this desperate urgent population pressure to do that, and I suppose at a time—after all, it was only in 1830 that the total population of the globe reached a billion. When Columbus discovered America, the total population of this country was 3 million, only slightly less than 1 percent of what it is now. So I suppose there was enough land lying around for people to engage in those kind of agricultural practices. As they move on, the land could reestablish itself over a century or so. A small number of people on large areas of land, but as the population started growing rapidly, more or less after World War II, when we made available to the developing world lifesaving and health-enhancing technologies which drastically reduced their rate of debt, but we did at that time concentrate on giving them technologies which would reduce their degree of work, too.

So we had something that came out in what demographers call the demographic transition, and it is only in the last 50 years that we have had a serious population explosion that, I suppose slash and burn was quite compatible with, with sustainability, but it isn't now, as you very properly say.

Mr. Lovejoy, Mr. James MacNeill was one of our first witnesses, and he stated that the industrialized world, when it comes to thinking about foreign aid expenditure has to stop thinking in terms of millions and start thinking in terms of billions, such is the need. And he thought we ought to be engaging in that for nature's strategies on the order of magnitude of billions of dollars. Has our knowledge and has our experience—have we developed sharp enough insights to operate on that large a scale, productively, sensitively to human needs and sensitive to environmental needs? Do we need a continuing period of experimenting on the whole debt-for-nature swap concept, or do we know enough right now to expand that very, very substantially from the millions to the billions?

Mr. LOVEJOY. I don't think there is any real hurdle there in expanding the financial support for debt for nature. In fact, I think we should have to get it up to not billions but to tens of billions, set it up as endowments, so that we create the stability I referred to. The problem is going to be scaling it up from an institutional and human resource point of view. So some of the early funding should go into strengthening institutions and building local human resource capacity in the countries in question. I mean, basically speaking, we have a first-class emergency, in terms of global environment, and we can't fool around and experiment with little things here and there until we can get things on a big scale. We really have to be operating both ways at once.

Representative SCHEUER. How much of a barrier are local sensitivities? We heard in this Wall Street Journal article, the article describes the situation in Rondonia in Brazil, which you're very, very familiar with. They describe an acute sense of rejection, outrage, resentment at the colossus of the north with a long history of environmental degradation of our own up here in the developed world, now getting religion and coming down there to tell them what to do and almost asserting the perquisites of a national identity sovereignty.

What kind of problems do we have on this whole sensitivity about sovereignty? How do we deal with it?

Mr. LOVEJOY. There's no question that here and there in particular countries, not the least of which is Brazil, one encounters this kind of sensitivity which is largely born of ignorance of what it's about, both the environment/development issue and what the debt conversion issue is all about. What gets the headlines are the kinds of reports that are in that Wall Street Journal article when, in fact, public opinion in Brazil about the environment has gone way way up in recent months and right here as we meet, there is a group of private conservation organizations meeting in Brasilia in the Central Bank to discuss alternative means of financing conservation, including debt swap.

Representative SCHEUER. Private conservation organizations——

Mr. LOVEJOY. In Brazil and meeting the Central Bank. So I think in the end, if we're careful about how we're presenting these things and also as a country we are seen to be dealing with our profligate ways with energy and our contribution to the greenhouse effect, that we can move relatively rapidly into an era of constructive environmental diplomacy.

Mr. ROBINSON. Congressman, just to add——

Representative SCHEUER. Hold on. I'm going to recognize you, but—and after I recognize you, I am going to ask Mr. Whelan, who has been dealing with the private sector, what do we have to do to involve private and public business leadership, in other words, the central bankers of these countries and private business leaders in this country, to support thoughtfully developed debt-for-nature processes and programs.

OK. Mr. Robinson.

Mr. ROBINSON. I just wanted to add to Mr. Lovejoy's response. One of the ways in which the problem can perhaps be addressed and accepted by local governments is through providing information through their local institutions or their national institutions that are working on these issues.

You raised the issue earlier about women and how to culturally, sensitively try and bring women into decisionmaking and management roles in Africa and in the Third World.

One of the things that we are doing at the Foundation is to sponsor research through African research organizations and through African research scholars on this sensitive issue. So the findings and the recommendations will be perceived by national policymakers, by people at the local level, as something that they themselves have generated and therefore will be much more acceptable.

Representative SCHEUER. All right. Mr. Whelan, can you give us some thoughts on how we can buttress the work and the leadership of people like Tom Lovejoy and AID officials and conservation officials in this country, foundation heads and so forth, with local leadership in the developing countries, local business leadership, the banking community, that Mr. Lovejoy mentioned they were actually meeting in the office of the Central Bank to discuss debt-for-nature swaps.

How do we enhance the contribution of the local power structure, the local business elite? How do we get them involved?

Mr. WHELAN. I am not sure if I am really competent enough to answer that question. It is not really an area that I have specific expertise in. I can report, though, that the general feeling, for instance, from conferences like this, is that there is a sense that environment is a U.S. issue or a developed nation issue, and there is a certain kind of tolerance. In order to do business with the developed nations, you are going to have to or you may have to adjust to environment and to the environmental issues.

The one area that does seem to make some difference is one where they can see economic benefits, tradeoffs, which may well be in terms of some sort of set of incentives.

I don't know that I can answer the question in any more detail than that.

Representative SCHEUER. Thank you. Mr. Lipton, you commented on the economic and political repercussions that might occur in the less-developed country, developing country, which actively took steps to implement a sustainable development program.

Can you elaborate on that and can you describe the local politics that might help or hinder such sustainable development programs. What seemed to be the hangups locally with sustainable development? I know, for example, when we were in the National Forest

Service, forestland in the Northwest that is not available for timber cutting, and is not available for mining, among the people who protested the most loudly, are people, loggers and miners, whose jobs might be affected. They don't take the long run very frequently on environmental issues. They take a very short run.

What are the dynamics that are set in motion when a developing country adopts sustainable yield practices in agriculture for forest harvest and for economic development? Who are the contesters and what are the dynamics of the politics that are generated?

Mr. LIPTON. As far as forestry is concerned, you have exactly the same reaction, that you have to attempt to conserve forestland here, in developing countries, particularly in India, but complicated by two things. One, an awful lot of the people who are going and cutting down fuel wood are very, very poor people. They are not big firms which have political clout, but they are poor people who feel that they have few other options than to do this. They are usually poor women who are going off and gathering fuel for their families and who are finding restraints imposed on them.

Two, and I think this is an important fact, it is felt by these people that the constraints are imposed by government departments which want to use the timber for their own purposes and want to maintain established rights in them which will be used by and for the government rather than the people. They feel, rightly or wrongly, that the motive is to increase the power of government rather than to conserve the resources. That creates very strong, sharp opposition which might not otherwise be there. I think that underlying this political problem and underlying all these various interests—which are not terribly different in their functioning, although they are more successful than here—is one general feeling. It is that development has to increase food availability for the 20- to 30-year future by rates of at least 3½ percent a year, in some countries at 4½ and 5 percent, if you look not only at population growth, but at increasing urbanization, increasing demand. Somehow that extra food has to be either grown or acquired through exchange, usually through growing other crops to exchange for food.

If governments do not see a way of getting that extra food to become available without environmental destruction, they will feel driven to do it with environmental destruction. That is why agricultural research to produce sustainable increases in yields is so central to doing anything about this, if we look at the 20- to 25-year horizon. If we look at the time it takes to get these population growth rates down, even with the best will, it is necessary to put more resources into researching sustainable rises in yields in food crops than we are now prepared to do. The two things, getting food yields up and conserving the environment, are two sides of the same coin; in the 20-year horizon you can't do one without the other.

Representative SCHEUER. Yes, Mr. Lovejoy.

Mr. LOVEJOY. I'd just like to add another thought about how one can avoid some of the sovereignty pitfalls, that is, to the extent that the development banks become interested in becoming agents for debt for nature, it takes it from being a bilateral exercise to a multinational one. It also sets it within the same overall cultural context. I understand, not first hand, that the president of the Afri-

can Development Bank is, indeed interested in pursuing this business of debt for nature.

Representative SCHEUER. Mr. Robinson, do you know, is there interest in Africa among chiefs of state, among the NGO's, among environmental leaders, among the leaders of women's groups, in the possibility of engaging in a broad-scale debt-for-nature swap? I construe that broadly.

Mr. ROBINSON. I'm not very conversant with national movements along these lines, Congressman. There are individuals who are very interested and supportive of these issues. Ms. Wangari Maathai, who you know from Kenya——

Representative SCHEUER. She testified in our first day of hearings.

Mr. ROBINSON. That is what I understand. She has been very instrumental in the green belt movement throughout Kenya in planting trees throughout that nation. That has caused her political problems because the head of state feels that she used this to develop a national following, which she might use later on to run against him.

Representative SCHEUER. He's very sensitive about that. As a general matter, I helped to organize—the Global Committee of Parliamentarians on Population Development organized the first all-African conference on population and development in Zimbabwe in 1986, and we selected—or the African delegates selected, as the leader of that, a very talented member of the Kenyan Parliament, and he did an outstandingly fine job.

Mr. ROBINSON. Wasn't that the vice president at the time, Babacar?

Representative SCHEUER. I will remember his name for the record.

Mr. ROBINSON. There is also a concern about desertification.

Representative SCHEUER. Let me just explain. After that conference where he received an enormous amount of complaints, he went back to his own country, and he was immediately subject to all kinds of harassment and intimidation. He sent his wife and kids out of the country immediately. He went into hiding. I think he served some time in jail, and he was ultimately kicked out of the Parliament for the same reason. The Kenyan chief of state felt this chap had done such an outstanding job that he might be a political opponent in the furture.

Mr. ROBINSON. I didn't mean to lead us into a discussion of politics.

Representative SCHEUER. But you opened the door on that. I am glad you did. That's a real problem with Kenya. I don't know if it would be a problem in other African countries where an individual like Wangari Maathai does an outstanding job in any field, be it environment, women's rights or whatever, and then becomes the subject of persecution and harassment simply because they have seized the mettle and have an outstanding leadership role and have received public support and acclaim and therefore become a threat, a political threat, to the chief of state.

Mr. ROBINSON. As you perhaps know, Congressman, Ms. Maathai is trying to spread the green belt movement to other countries. To

some extent, we have facilitated this at the African Development Foundation.

As I was about to say, there is a great concern, obviously, for desertification. The Sahara Desert is growing at a phenomenal rate due to overgrazing and cyclical droughts and these things. If Babacar N'Diaye, who is president of the African Development Bank gets solidly behind debt for nature, I think it would have the effect of being accepted by many of the African nations, because the African Development Bank is highly respected by African nations, having been established by the Organization of African Unity back in 1963. So that is a very hopeful sign.

Representative SCHEUER. I would like to ask the rest of the panel the question that I addressed to Mr. Whelan.

How can we involve the elite, the private business elite in developing countries to get behind the concept of sustainable development? I am looking at the longer term. After all, no businessman in his right mind would destroy the very machinery that produced his profits, yet on a national basis, when we destroy a tropical rain forest, we are killing the goose that laid the gold egg. When we plow land that shouldn't be plowed, when we pump water out to such an extent that we are seriously depleting our water assets, and we are doing that all over the world, we are paying a terrible price over the long term for exploiting the environment in the short term. No businessman would do that in the conduct of his own business.

How do we get them to raise their voices and support programs to avoid these awful environmental costs to their own countries? Do any of you have any experience in countries where businessmen have been mobilized to support sustainable development practices?

Mr. WHELAN. Congressman, I would like to add one point. The International Finance Corporation, which finances private sector operations, it has now become a requirement in every project where environment is a question that be brought into consideration of proposals for the loan and the decisionmaking loan and so forth. Therefore, that is one way that it can be done, through the multilateral funding as a requirement in the funding that comes from outside.

Mr. LOVEJOY. I just wanted to reinforce your line of thinking about the regional development banks. Those are much more likely to respond and be effective than the great big behemoth of the World Bank itself.

Representative SCHEUER. Apparently, the World Bank is making real progress.

Mr. LOVEJOY. They are, but they still move very slowly.

Representative SCHEUER. Barber Conable really did say it would take 3 to 5 years before they managed to move this behemoth and include these what have been up to now extraneous account factors.

Anybody else? Yes, Mr. Lipton.

Mr. LIPTON. I think the idea of deducting depreciation of land and land-based resources, just as we deduct the depreciation of capital, from GNP when we measure it is a sensible idea. I proposed this idea in 1968, so I have some stake in it, but I don't think we should have too high expectations of what it will do for you, be-

cause most of these resource depletions are far into the future, and if we discount them at the current very high rates of interest, take the 10-percent rate of interest which the World Bank uses in discounting, we are not going to get rid of many environmentally damaging projects, just by using this accounting method alone.

I think what Mr. Lovejoy suggested is that we may need to adopt lower rates of discount, lower rates of interest, in evaluating resource depletion. That is something that needs to be brought up at a fairly early stage, if you want this sort of project screening effect you are looking for.

If I may make just one positive suggestion, probably the most environmentally preserving thing that has happened in the developing world in the last 25 or 30 years has been the high-yielding varieties, not just of wheat and rice but also recently of hybrid sorghum and a whole lot of other cereals. These have made it possible safely to get high returns with high fertilizer intakes in appropriate lands. This, in turn, removed the need for farmers to go into farming marginal and risky lands, to overfarm them, and to cause depletion of nutrients and water resources. It really is essential to see the process of safeguarding risky environments as one side of the coin.

The other side of that coin is improving the utilization of farming environments which are safe to utilize and getting higher rates of return from those environments by suitable varietal improvements. That means more research. The yield potential of rice, tropical rice, has not budged since IR–8 in the mid-1960's. That is more than 20 years. We really do need a lot more research at the national and international level in order to make it possible for governments to step back from the process of depleting marginal lands. Right now, there is nothing coming out which is really raising productivity rapidly enough in food crops.

Representative SCHEUER. Well, this is a hearing of the Joint Economic Committee, but fortunately, we all wear a lot of hats, and one of my hats is chairing a subcommittee of the House Science, Space, and Technology Committee. That subcommittee that I chair is called Natural Resources, Agricultural Research and Environment, and we did have a hearing 7 or 8 years ago on the kind of agricultural research that we ought to be performing here in the industrialized countries of the world or at least taking the leadership organizing it. That would be appropriate to Third World farmers who don't have unlimited inputs of capital. They can't afford a lot of irrigation, they can't afford a lot of insecticides, herbicides, they can't afford a lot of fertilizer. They don't have $250,000 combines. They work with appropriate technology—at a rather low level of appropriate technology. They don't have enormous-sized farms. They have small plots. So the kind of research that is appropriate for them is totally different than the kind of research that they do at Texas A&M, in our land-grant colleges for farmers with enormous availability of capital input.

But maybe we ought to do another day of hearings. I suppose this ought to be off the record.

[Discussion off the record.]

Representative SCHEUER. Back on the record. We are approaching the witching hour. In another minute or two the House goes into session.

Mr. Reid, you have highlighted the efforts of NGO's and the importance that they have, along with international organizations and individual country governments, the unique contribution NGO's have to make, and Mr. Robinson, you have done the same thing. I was fascinated by hearing of your granting $15,000 to the women of Kenya, I believe it was?

Mr. ROBINSON. Zambia.

Representative SCHEUER. How can NGO's and citizens' groups be brought in and involved in the process of encouraging sustainable development?

Mr. REID. I guess I would like to first answer that by saying that the efforts of the African Development Foundation and the Inter-American Foundation are definitely a step in the right direction. When we are looking for examples of successful projects, I think the Inter-American Foundation, without exception, was involved in more than any other single group that we were looking at. I would say that to bring NGO's to play a greater role in this, what they require more than anything is build up to their own infrastructure. We are right now turning to NGO's with a great deal of expectation for what they can provide, and yet frequently they do not have the access to information and the technical abilities that other players in this issue do have, so efforts to build up training and education to increase the infrastructure within small NGO's themselves is the real key point that we can put pressure on. A lot of the grants from the Inter-American Foundation and the African Development Foundation, many of the CARE projects, the World Neighbors projects and a number of NGO projects are addressing just that very issue of trying to increase the capabilities of NGO's.

Representative SCHEUER. Mr. Robinson, you talked of helping African women by this weaving project, enabling them to double or triple their income. That is a fantastic intervention in their lives. Did you intervene in any other way? For example—and you mentioned they had anywhere from two to eight children. As part of the total package by which you enhanced their lives, were they given any training in the benefits of family planning? Did the women also do farming? If they did farming, could they be trained in environmentally sustainable ways of tilling their land?

Mr. ROBINSON. Not in this particular project that I cited, Congressman, but in other projects that we have funded that impacted on the women directly, which are of a broad-based nature, they are often exposed to a number of different services. They may be health services, which include maternal and child health care and family planning, information as well as services. It may be services in food production because as you noted women in Africa produce 75 to 80 percent of the food. The Foundation supports projects that include women in just about every part of the development process, in management decisionmaking as well as in food production and in health care delivery and family planning. In the Desai project, we only funded the weaving component of the project, but I am certain that through the YWCA, the women were exposed to family planning information services.

Representative SCHEUER. Mr. Lovejoy, you developed almost singlehandedly this debt-for-nature concept. I was fascinated to hear of some of your successful experiences. Do you have any suggestions, specific suggestions for international conservation financing that would be schemes based on something other than debt-for-nature swaps for creditors to consider, creditors that would consider—well, for example, including environmental concerns in their restructuring and debt relief strategies?

Could you see a role that the Japanese, which is the major source of development capital in the world, could play in a regional reforestation program, especially in Africa, enhanced level of environmental responsibility and enhanced level of environmental behavior would be a sine qua non, it would be a requirement with the countries who sign up for it as a condition of getting major financing?

I suppose this program or a reforestation program locally would be in the 10's of billions of dollars. It is not exactly debt for nature. It is financing for a major development program that would require the country that accepts it to have to develop environmentally sensitive concepts of development sustainability.

Mr. LOVEJOY. I think we have every reason to make common cause with the Japanese, who are now the single greatest donor of foreign aid. Both the concerns of getting uniform standards about the environment to avoid environmentally damaging projects; but also to initiate proactive conservation projects like the World Bank is now doing with national environment projects is very important. We all ought to be in this together.

Representative SCHEUER. That is an excellent closing line. But we will hear from Mr. Reid.

Mr. REID. I just wanted to respond to the same question. There was a recent study that was funded by UNPD, the World Bank, FAO, and I believe a number of other organizations, that was conducted by WRI to look into various financial mechanisms to increase the flow of money to sustainable development projects. One that received more support than any in a variety of hearings around the world was what is being referred to as the International Environmental Facility. The idea would be to take advantage of a group of people to identify sustainable projects in other countries, using people within the countries and providing technical support to initiate sustainable development projects early in the pipeline. Right now, we are relying on what is coming out at the end of the pipeline to decide are these good or are these bad, and the idea is to get earlier in the process to identify useful facilities.

Representative SCHEUER. Useful facilities?

Mr. REID. I mean useful projects.

Representative SCHEUER. And help form them?

Mr. REID. Yes. And going back to your earlier question, what intergovernmental groups that you participate in could do to provide pressure to ensure sustainable development, that would be one thing to try to encourage the establishment of an international environmental facility to provide those kinds of support.

Representative SCHEUER. Yes, Mr. Lovejoy.

Mr. LOVEJOY. If I might just add to that a little bit. The environmental problems are so large and the time to do anything effective-

ly about them is so short, that basically, we need to harness the existing development agencies which have the people and have the infrastructure. Basically, we need born again development banks.

Representative SCHEUER. Could you repeat that?

Mr. LOVEJOY. Born again development banks, which have the environmental religion.

Representative SCHEUER. Mr. Lovejoy, those were two beautiful closing lines. I thank you very much. The House is now in session. There will be a rollcall vote. I am very grateful to you for this excellent hearing. Thank you so much.

[Whereupon, at 12:05 p.m., the subcommittee adjourned, subject to the call of the Chair.]

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