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**Plan B: Rescuing a Planet under Stress and a Civilization in Trouble
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Mr. Lester Brown, President, Earth Policy Institute: First let me congratulate you on 40 years of unmatched rail service to the people of Japan. Secondly, let me thank you for inviting me to be part of this 40th anniversary celebration.

For an American, to see a railroad system that measures its average time of late arrivals over the course of a year in seconds rather than minutes is a rather astonishing thing. In the United States, shortly after he was elected president, John Kennedy outlined a schedule for landing a man on the moon. He said by the end of this decade—which would be 1969—we would land a man on the moon. And we did it on schedule. Now, if we could just get our trains to run on schedule. When I leave Japan and go back to the United States after traveling around Japan by train, I feel in the United States as though I have returned to a Third World country, because we are so far behind in our rail service. So I congratulate you on setting the standard for the world in the quality, timeliness, and reliability of rail service.

I am not a railroad person. This hall is filled with many people who know much more about railroads than I will ever know. My assignment is to talk about building an environmentally sustainable economy in the very broadest sense. I will be drawing heavily on a recent book that was published here in Japan just a year ago this month called *Plan B: Rescuing a Planet under Stress and a Civilization in Trouble*. I will first talk a bit about the problems that we are facing on the environmental front in the world and then some of the things we need to do about them.

Those of us who have been working on environmental issues for a long time have been saying for some years that if the environmental trends of recent decades continue, that we will eventually be in trouble. We look at a wide range of environmental trends: at shrinking forests, expanding deserts, collapsing fisheries, falling water tables, eroding soils, rising atmospheric carbon dioxide (CO₂) levels, rising temperature, ice melting, disappearing species. And one can go on looking at the long list of environmental trends that are slowly undermining our economic future. I do not know of any scientist who would argue that these trends can continue indefinitely without our modern civilization being in trouble. We have been saying that if these trends continue—these environmental trends—we will eventually be in trouble.

What has not been clear is what form that trouble would first take and when it would likely come. I now think it is likely to come on the food front first and within the next few years; not 20 or 30 years from now, but within the next two or three years. Food security is affected by environmental trends obviously, including some of the oldest, longest standing trends such as soil erosion. Indeed we study the archaeological sites of

earlier civilizations that did not deal with the problem of soil erosion and it eventually led to insecure food supplies and the decline of those civilizations. But I would like to focus this morning on two new environmental trends that are affecting world food production: falling water tables and rising temperatures.

Water tables are now falling in countries that contain more than half the world's people. These countries include the big three grain producers, the United States, India and China. In each of these countries, water tables are falling. In the United States, water tables are falling throughout the Southern Great Plains and throughout the southwestern United States including in our populous state, California. In the Southern Great Plains, including the states of Kansas, Oklahoma, and Texas, the irrigated area has shrunk 24% since 1980 as a result of aquifer depletion. In India, water tables are now falling in most states. One of India's leading water analysts recently said that unless we can arrest this depletion of our water resources, we will face chaos in the countryside. India now has 21 million irrigation wells powered by either diesel or electrically driven pumps and they are pumping water at an unprecedented rate. In China, water tables are falling throughout the northern half of the country. Under the North China Plain, which produces a third of China's wheat and half of its corn crop, water tables are falling from one to three meters per year.

Not only is the supply of irrigation water beginning to shrink in a number of countries, and we have seen this most dramatically in Saudi Arabia where the irrigated area and the wheat harvest have been reduced by some 60% over the last decade or so as a result of aquifer depletion. Now we are beginning to see, for the first time, a decline in grain production in a major food producing country, namely China. And I will come back to that shortly. Not only are farmers in many countries faced with a shrinking amount of water, but they are getting a shrinking share of that water supply as cities take more and more.

In our offices at the Earth Policy Institute in Washington, we subscribe to a magazine published in California, which is called *The Water Strategist*. Each month, this magazine lists the water sales of the preceding month and these water sales, nine times out ten, are sales by farmers to cities. Almost every day, there is another water sale somewhere in the western part of the United States. It may be a large farmer selling his irrigation rights to a nearby town or city, or it may be a whole irrigation district selling their water rights, because the value of water in cities and industry is far greater than it is in agriculture.

I remember a few years back, looking at the economics of the water market in China. If you have 1,000 tons of water in China, you can use that to produce 1 ton of wheat, which is worth at most US\$200. You can also use that 1,000 tons of water to expand industrial output by US\$14,000 or 70 times as much. In the competition between cities and the countryside, farmers always lose.

The world has little experience with aquifer depletion. This is an historically recent phenomenon. Irrigation problems go back 6,000 years, but the depletion of aquifers is quite recent. We began depleting aquifers only with the advent of diesel and powerful

electrically driven pumps. So we are seeing widespread aquifer depletion throughout the world, at the same time. And I would simply remind you that over-pumping to satisfy our food needs today almost guarantees a decline in food production tomorrow when the aquifer is depleted. So this is an invisible problem; it is an accelerating problem; and it is a widespread problem.

While many of us recognize that we are facing a future of water shortages, not everyone has connected the dots to realize that we are also facing a future of food shortages. There has been much attention lately in the press to the depletion of the world's oil reserves and the concern that world oil production may peak within a matter of years. And while oil is terribly important to our modern economy, there are substitutes for oil. There are no substitutes for water. We lived for millions of years without oil, but we would live only a matter of days without water. Water is not only important in its own right; it is now one of the keys to expanding world food production. It is one of the things that is making it more difficult for the world's farmers to keep up with the growth in world food demand.

In four of the last five years, world grain production has fallen short of consumption. As a result, we have drawn world grain stocks down to the lowest level in 30 years. The big question now is next year. This year incidentally after four consecutive shortfalls, this year the world had an extraordinary crop—the best growing weather in major food producing regions in at least a decade. But even so, we have not been able to rebuild depleted stocks. We are just barely covering this year's consumption. So then the big question becomes what about next year? What if we have another crop shortfall? If we do, we will be in uncharted territory. My sense is that the first global economic indicator to signal serious trouble on the environmental front will be food prices.

I have been talking so far about falling water tables. I would also like to talk about rising temperatures. Over the last two years, there have been a number of research reports by crop ecologists who have focused on the precise relationship between temperature and crop yield. One of these was published in the *Proceedings of the National Academy of Sciences* in June of this year. What the scientists pointed out in focusing on rice, was that for each one degree Celsius rise in temperature during the growing season, we can expect a 10% decline in yields. Other scientists have found a similar relationship for other grains, wheat and corn for example. The rule of thumb that is emerging from this research is that for each one degree Celsius rise in temperature, we can expect a 10% decline in grain yields—wheat, rice and corn.

The world's temperature is now rising in a very steady manner. It has been rising rapidly since 1970. If you look at the historical record and we have reasonably good data going back about 140 years, you can see the rise since 1970. It averages about 0.7 degrees Celsius, according to the numbers drawn from the National Aeronautics and Space Administration's (NASA) Goddard Space Institute world temperature series. We are looking now at projected increases in world temperature according to the International Panel on Climate Change, a group of some 1,500 of the world's leading meteorologists, ranging from a low of 1.4 degrees Celsius to a high of 5.8 degrees Celsius.

Farmers now on the land are facing the prospect of higher temperatures than any generation of farmers since agriculture began. On the climate front, we are moving into uncharted territory. Not only are we facing record climate change, but we are also facing uneven temperature rises. The numbers I used in projected temperature increases during this century referred to the global average. But we know that temperatures over land will increase more than those over the oceans; that those in the higher latitudes will increase more than those in the equatorial regions and that the temperatures in the interior of continents will increase more than those in coastal regions. And when you superimpose these three maps for temperature increases on North America, for example, it nicely concentrates the temperature rise in the Great Plains of the United States and Canada and the Corn Belt, in effect the world's bread basket.

If it becomes apparent that rising temperatures are shrinking harvests and driving up food prices, we will suddenly have a powerful new lobby for cutting carbon emissions, namely consumers. I do not think any economic indicator is more politically sensitive than food prices.

The event that is likely to bring the tightening food situation into focus, I think, will be when China comes into the world grain market for massive quantities of grain. Between 1950 and 1998, China's grain production went from 90 million tons to 392 million tons. It was one of the great economic success stories of the last century. But then something happened that most analysts did not expect. China's grain production turned downward. Between 1998 and 2003, it dropped by 70 million tons. 70 million tons exceeds the grain harvest of Canada. Now, China was able to cover this decline by drawing down its once massive stocks of grain. Those stocks are now largely depleted and China is beginning to turn to the world market. I would just point out that the two principal contributing trends to the shrinkage of China's grain harvest are one, the loss of cropland to industrialization—building factories, roads, highways, exactly the same thing that happened in Japan, beginning 50 years ago—and, two, the loss of irrigation water from aquifer depletion and the diversion to cities. So China's grain production dropped precipitously. This year, with higher support prices, especially for rice and much better growing weather, China has at least temporarily reversed that five year drop, but it is still some 50 million tons below what it was in 1998.

Now that China's grain stocks are largely depleted, it is turning to the world market for imports. It has bought for import this year, 8 million tons of wheat. Two years ago it was self-sufficient in wheat. In one year, China has gone from modest imports to being the world's largest wheat importer. China has now announced its grain import quotas for next year. This is a most unusual step—they rarely do this. But they have said that next year they plan to import 10 million turns of wheat, 5 million tons of rice, 7 million tons of corn and 2 million tons of barley. That is 24 million tons of grain imports; again, going from this essentially self-sufficiency last year to imports of 8 million tons of wheat this year to imports of 24 million tons of grain next year. I think within the next two or three years, China is likely to be importing 30, 40, 50 million tons of grain.

When China turns to the world market for imports on this scale, it will necessarily have to turn to the United States. This will create a fascinating geopolitical situation, because we have 1.3 billion Chinese consumers who have a US\$120 billion trade surplus with the United States competing against US consumers for US grain. China's trade surplus alone—US\$120 billion—is enough to buy the entire US grain harvest twice. So it is not a matter 'can China compete'—China can. The question is how will the US respond? Now if this had happened 30 years ago; if a country had threatened to buy so much US grain that it would drive up US food prices, we would have closed the door. We would have restricted exports. But today, the United States has a stake in a politically stable China. The Chinese economy has been the engine powering the Asian economy over the last decade or so. Beyond that, the Chinese economy is the only large economy in the world that has maintained a full head of steam in recent years. So the entire world is leaning on China to some degree to keep things moving.

Now, if China turns to the world market for massive quantities of grain, it will almost certainly drive up grain prices. And the risk is that higher grain prices could destabilize governments in low-income grain importing countries. And that political instability could disrupt global economic progress. Among the countries that could be affected would be Indonesia, Nigeria, Mexico. I cite these three countries because they happen also to be oil exporting countries. All three import substantial amounts of grain.

What we may be looking at is a situation where environmental trends—and I have talked importantly about falling water tables and rising temperatures—could translate into economic trends—that is rising food prices. That could then have political consequences—political instability in lower income countries that could disrupt global economic progress. At that point, it would affect the Nikkei Index, the Dow Jones 500, and while most of us in this hall could deal with higher food prices, we would all be affected by a disruption in overall global economic progress.

We are at a point in history, I believe, where we may soon get this wakeup call, as I have just described. Then we have to ask ourselves, how do we deal with this? How do we respond? And that is what the book *Plan B* is about. Plan A is business as usual. What if we do not respond and just let things keep going? Let wells continue to go dry, let temperatures continue to rise, let soils continue to erode, deserts to encroach on cropland, etc. That is Plan A: business as usual. I do not think it is going to work. And the sooner we realize that, the better.

In thinking about Plan B, I select three particular initiatives that I think are at the heart of what we need to do: raise water productivity; stabilize world population size sooner rather than later; and stabilize climate sooner rather than later. My guess is that within the next two or three years, we will look back at the Kyoto Protocol as totally inadequate and we will have to be going far beyond that.

Let me first talk for just a minute about raising water productivity. The situation with water today is in many ways similar to that with land a half century ago. As we came out of World War Two and moved into the 1950s, we looked ahead toward the end of the

century and saw enormous projected growth in world population—unprecedented projected growth. But even then there was relatively new land in the world to bring under the plow. So we had to concentrate on raising land productivity. We began in the 1950s to systematically apply science to agriculture specifically to raising land productivity. We built, we created agricultural extension services around the world, farm credit agencies, a price support system for farmers, not only in the United States, but in countries like India, for example. In 1995 I helped draft the agricultural policy plan for India, to abandon ceiling prices which catered to urban consumers and replace them with support prices that would encourage farmers to invest in raising land productivity. The result of that worldwide effort was to raise the average grain yield in the world from 1.1 ton per hectare in 1950 to 2.7 tons per hectare by the end of the century.

We now need to do the same thing with water. Interestingly we do not even have the vocabulary or the indicators to measure water productivity. If I were to ask you ‘how do you measure water productivity,’ you probably would not have a very good response. With land productivity, we have been using tons of grain per hectare or if you are English or American, bushels per acre, but we have a common global measure of land productivity. We now need the same thing for water productivity. We also need to keep in mind that 70% of all the water we use in the world, that we pump from underground or divert from rivers is used for irrigation.

The second thing we need to do is stabilize population and do it sooner rather than later. And there are two or three key components here. One is making sure that women everywhere in the world have access to family planning services, to reproductive healthcare. We cannot afford for any woman not to have access to family planning services. There are an estimated 140 million women in the world today who want to limit family size, but they do not have access to family planning services. I want to commend Japan for its leadership in this field in supporting the international family planning effort. And I apologize of the US withdrawal of all funding for the United Nations (UN) Population Fund, the world’s leading source of international family planning assistance. I think this was a huge mistake on our part.

In addition to making sure that women have reproductive healthcare and family planning services, we need to create the social conditions that will accelerate the shift to smaller families. This means universal primary school education, for example. This happens to be one of the UN Millennium Development Goals: universal primary school education for all youngsters by 2015, girls as well as boys. There is no social indicator that correlates more closely with the shift to smaller families than the level of female education. Simply stated, the more education women have, the more options they have and the fewer children they have. And this is a relationship that cuts across all societies.

We need to think about basic healthcare, at the village level—immunization for children, for example, against infectious diseases. It costs so little per child, and yet there are hundreds of millions of children who are not today being vaccinated. We need to think about nutrition, and in the poorest of the poor countries, school lunch programs, because it is not just a matter of getting school. It is getting children in school with enough food in

their stomachs so that they can learn, so that they are capable of concentrating. When you are hungry, it is very difficult to concentrate.

Using UN data and World Bank data, I have estimated that the cost of reaching these goals of at least rudimentary healthcare in all villages and education for all youngsters at the primary school level would cost the world US\$62 billion per year. Now, US\$62 billion sounds like a lot, but it is less than the US\$87 billion that the United States is spending in one country, Iraq, this year. But if the United States were to step forward with a leadership effort to in effect eradicate poverty, which is essentially what I have been talking about, the world would follow. The world would follow and with great enthusiasm.

The third thing, the third principal component of Plan B is stabilizing climate. Let me talk a bit first about what we can do on the demand side. Again, I am just going to use a couple of examples. Whenever I check into a hotel around the world, one of the first things I do in my room is to look at the light bulbs. Are they old fashioned incandescent light bulbs or the new compact fluorescent bulbs? The reason I look is because the latter use only a third as much electricity and provide the same light. It is sort of out place for an American to be criticizing Japanese about energy efficiency, but in this hotel, we have mostly the old fashioned, inefficient incandescent light bulbs. If it becomes clear that rising temperatures driven by rising carbon emissions are shrinking harvests and driving up food prices, we might decide to very quickly phase out the old fashioned incandescent light bulbs worldwide. If we were to do that over say the next three years, we could close literally hundreds of coal fired power plants. No change in lighting, just doing it more efficiently.

A second example of how we can dramatically cut carbon emissions, and here I will use the United States. If over the next decade we were, in the United States, to shift entirely to gas-electric hybrids, with the efficiency of last year's Toyota Prius, we could cut gasoline use in half, easily. No change in the number of automobiles, no change in the number of miles driven—just doing it with a more efficient technology. This is another area in which Japan is leading the world, the development of gas-electric hybrid technology. It is not only Toyota, but Honda; both way out in front of the rest of the world. Using the Environmental Protection Agency (EPA) mileage efficiency standards, the Toyota Prius, a mid sized car, gets 55 miles per gallon. The average efficiency of new cars sold in the United States is something like 20 miles per gallon—a huge difference.

There is today an enormous demand for gas-electric hybrid in the United States, one that has far outstripped the available supply. I think the same may also now be true in Japan, if I remember correctly. But in the United States, if you want to buy a new Toyota Prius, you will have to wait from four to 18 months, depending on where you live in the country, because Toyota has allocated its supply geographically. One of our board members recently got a Toyota Prius. He and his wife had been on the list for some months and the local Toyota dealer near Princeton New Jersey called and said, “Your Prius has arrived. You may come pick it up.” So he and his wife went to pick it up. They signed the papers, arranged the financing, everything was finished. They were preparing

to get in the car and drive home and the dealer said, “If you will leave the car here, we will pay you US\$5000 more than you just paid us.” The reason for this is that the Toyota dealer had to sell the car at the list price. But once it was sold, then it was on the market and they wanted to buy it back. In effect, we now have in the United States, a black market for the Toyota Prius because demand has run so far ahead of supply. This year, there will be something like 100,000 gas-electric hybrids sold in the United States, including Toyota Prius, the hybrid version of the Honda Civic, Honda’s Insight. Anyhow, both Honda and Toyota now have gas-electric hybrids on the market.

Once we get the gas-electric hybrid, then we have a plug-in option. And what I am proposing—and I am not alone in this by the way, a number of automotive analysts are also proposing the same thing, automotive engineers—that gas-electric hybrids be developed with a plug-in capacity and a second storage battery. Because with that option, when you are at home at night, you can plug the car in, recharge both storage batteries and do most short-distance driving with electricity alone. The gasoline tank is there and the gasoline engine is there if you need to take a long drive on the weekend. But most daily commuting in the United States, I think the average commute is 12 miles, round trip, or going grocery shopping or what have you—short distance driving could be done almost entirely with electricity. This could reduce gasoline use by another 20%. We have already got a 50% reduction as we shift entirely to gas-electric hybrids. We could probably get another 20% for a total of a 70% reduction in gasoline use in the United States, the country that is the leading source of the carbon emissions that are destabilizing the earth’s climate.

Another example. There is, in the developing countries, a feeling that they want to emulate the Western industrial development model—the fossil fuel based, automobile centered, throw away economy. I watch this with interest in China, for example. In 1994, China announced that it was going to develop an automobile centered transportation system. And it issued invitations to the major automobile manufacturers like Toyota, General Motors (GM), Volkswagen to submit bids for automobile assembly plants in China.

A group of eminent Chinese scientists challenged this decision. They challenged it on several grounds, including the great need for imported oil, traffic congestion, air pollution, etc. But the principal reason they said that this was not a viable option for China, was that China did not have enough land both to pave the land needed for automobiles—imagine a car in every garage in China someday and how much land would have to be paved. It will not work. If China were to have a car in every garage, it would have to pave over an area almost as large as the area in rice today. We would have affluent automobile owners competing for land with low-income food consumers, not only in China, but in India and developing countries everywhere. I do not think the automobile-centered transport system is going to work in densely populated developing countries.

And the alternative, and this was proposed in the White Paper by the team of Chinese scientists, was that instead China concentrate on developing an advanced rail system:

light rail in cities, inter-city rail transport, and augment that with buses and bicycles. This would minimize the amount of land required to provide the mobility that people everywhere want as their incomes rise.

Now references were made earlier about the energy advantages of trains versus cars or planes. But there is also an enormous land advantage. And that I think is going to figure more and more prominently in our discussions of transportation systems in the future.

Let me turn now to the supply side. Incidentally, we were running ahead of schedule. Can anyone tell me how much more time I have? On the program it was to go to 10:30, is that still okay? Yes? Okay, thank you. I do not think I will go to 10:30, but I just wanted to be certain. On the supply side, we now have some enormous new opportunities with renewables and I would like to talk about one of those briefly, and that is wind power.

Worldwide wind generated electricity has been growing at more than 30% since 1995. I should also point out that I think there is an enormous potential for solar cells as the cost curve continues to come down, but it is not yet economically competitive for large-scale uses, but we are coming. I think solar cells will play an important role, but I would like to concentrate on wind. As of today, there is enough wind-generated electricity in Europe to supply the residential needs of 40 million people. The projections by the European Wind Energy Association are that by 2020, there will be enough wind generated electricity to supply the residential needs of 195 million people, or half of Europe's population. A more recent study, a projection by a wind energy engineering consulting group says that if European governments get serious about developing off-shore wind, that by 2020, all of Europe's residential electricity needs could be satisfied by wind power. I mention this just to give a sense of what the potential is. In the United States we now have commercial-scale wind farms feeding into the grid in 22 states. But Europe is moving much faster.

There are six reasons why wind is growing so fast. It is abundant, cheap, inexhaustible, widely distributed, clean and climate benign. No other energy source has those six attributes. Let talk for just a minute about abundance and I will use the United States because I know that data best. In 1991, the US Department of Energy did a national wind resource inventory, which pointed out that three of our 50 states—North Dakota, Kansas, and Texas—had enough harnessable wind energy to satisfy national electricity needs. Many people said “Wow.” They had trouble believing that this could be the case. But in retrospect, we know that was a gross underestimate because it was based on the wind turbine technologies of 1991. Advances in wind turbine since then enable wind turbines to operate at lower wind speeds, to convert wind into electricity more efficiently, and because they are much taller—instead of being maybe 40 meters, they are 100 meters tall. So they are harvesting a much larger wind regime. I have talked only about three states in the United States. There are many other wind-rich states and that national inventory did not even include offshore wind, and we have a long coastline. So there is an enormous amount of wind energy.

The cost is coming down. When the modern wind industry began in California in the early 1980s, wind generated electricity cost 38 cents a kilowatt hour. Recent wind farms coming on line have been around four cents. There have been some long-term supply contracts signed at three cents a kilowatt hour and the projections are that in many parts of the world, it will be down to two cents a kilowatt hour by 2010. Wind is an extraordinarily abundant, cheap, inexhaustible source of energy.

Now, I mentioned earlier that in the United States, if we shifted to gas-electric hybrids, we could cut gasoline use in half and if we had a plug-in capacity, we could drop it still further. But what that plug-in capacity enables us to do is to use wind-generated electricity. We could build thousands of wind farms in the United States, feed that electricity into the grid, and then use it, in effect, to run our gas-electric hybrid automobiles. Two advancing technologies—gas-electric hybrids and advances in wind turbine design—have opened up a whole new world for cutting carbon emissions, not by 6-7%, but by cutting it in half. Enormous possibilities!

Now one of the questions I have asked myself and I was asking this when I was working on *Plan B* is how quickly can we restructure the world economy, especially the energy economy, if it becomes clear that we are in trouble on the climate front? And I went back and reread some of the economic history of World War Two and specifically I focused on President Roosevelt's State of the Union address, January 6th, 1942. It was in this address that he laid out the arms production goals for the United States. He said we will produce 45,000 tanks, 60,000 planes, 20,000 artillery guns, and 6 million tons of shipping. Because we were faced with an enormous logistical challenge of fighting two wars on the far side of two oceans, we needed a lot of ships in a hurry. No one had ever seen arms production goals like this before. These numbers went far beyond what anyone had ever even imagined.

But what President Roosevelt and his colleagues realized at that time was that the US automobile industry represented the largest concentration of industrial power in the world. Even during the Great Depression of the 1930s, we were manufacturing 2-3 million cars per year. So after his State of the Union address where he laid out these arms production goals, he called in the leaders of the automobile industry and he said since you represent such a large share of our national industrial capacity, we are going to depend heavily on you to meet these arms production goals. And they said, well Mr. President, we will do everything we can, but it is going to be a stretch to produce all these arms and cars too. And he said, you do not understand—we are going to ban the sale of private automobiles in the United States. And that is exactly what happened. From the beginning of April 1942 until the end of 1944—nearly three years—there were essentially no cars produced in the United States. The automobile industry was converted to arms production and it did not take decades, it did not take years. Most of the restructuring was done in a matter of months. Chrysler went from manufacturing cars to manufacturing tanks in months. I mention that because we today feel, “Oh, we cannot meet the Kyoto Protocol goals because it would require a lot of changes.” We have the technologies to dramatically cut carbon emissions and move toward climate stability. What we need now is some imagination and leadership. It is entirely doable.

In thinking about resources, when I was researching *Plan B* a couple of years ago, I looked at the US Budget and specifically at the Department of Defense (DOD) budget. In, I think it was 2002—this was before the Iraq war—the DOD budget was US\$343 billion. That exceeds the military expenditures of all our allies in the North Atlantic Treaty Organization (NATO), plus Russia, plus China. It is huge. It was the Retired US Navy Admiral Eugene Carroll who said a couple of years ago, “for 40 years we were in an arms race with the Soviet Union. Now, we are in an arms race with ourselves.” I think he was quite right. If we look at the US\$343 billion defense budget before Iraq, if we look at the rest of our foreign policy budget—the State Department, Agency for International Development (AID)—it would come to probably something like US\$360 billion a year.

Now, my question is this: what would the world look like, how would the world change if we said that of our total foreign policy budget of US\$360 billion, we are going to use half for military purposes and the other half to eradicate poverty, to achieve universal primary school education, to provide rudimentary healthcare at the village level, working with the community of nations? We would restore hope in the world, not only for ourselves, but for the entire world. We could change the world, much as the United States did with the Marshall Plan after World War Two. I mean, we literally reversed history then. Instead of plundering the countries we had defeated, we helped them rebuild. And that was a leap—a quantum leap in thinking about how countries relate to each other. We are now at a similar point in history where we need another leap in how we think about that set of relationships.

I have not talked about terrorism at all today. I have talked mostly about food security. For most of the world, food security is infinitely more important than terrorism. For the 800 million plus people who are hungry and malnourished today, terrorism is a minor thing; hunger is not. On September 11 th 2001, I was in New York City to give a luncheon address at the *New York Times* about the new book, *Eco-Economy: Building an Economy for the Earth*, that was about to come out. Needless to say, by midmorning that lunch was history. It was never held. And what I have come to realize since then is that political leaders around the world and the communications media have been so preoccupied with terrorism and more recently the war in Iraq that they have largely neglected the environmental trends that are undermining our future. And the irony of this is that if Osama bin Laden and his colleagues succeed in diverting our attention from the trends that are undermining our future like falling water tables, rising temperatures, they may reach their goals for reasons that even they did not imagine.

Thank you very much.