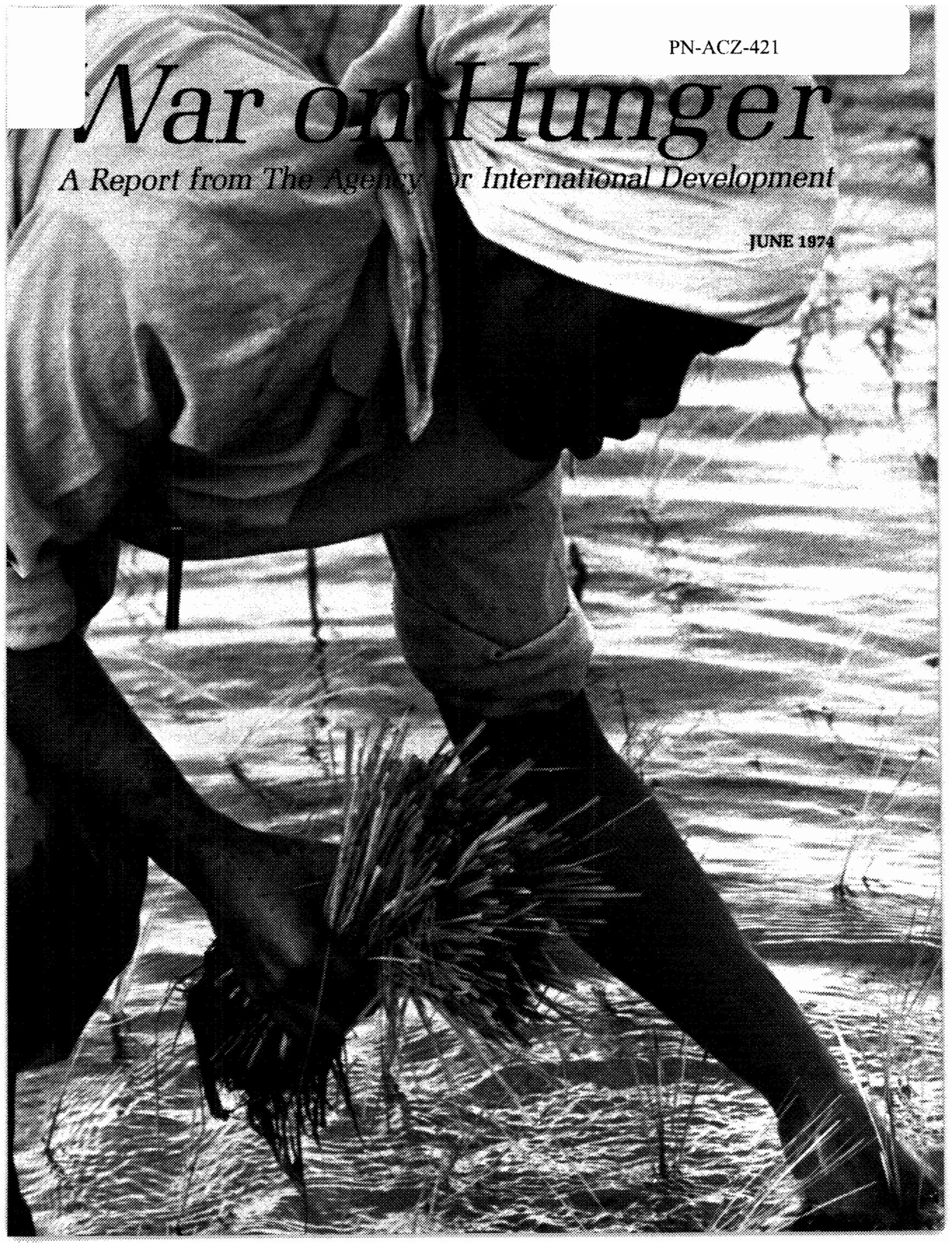


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War on Hunger

A Report from The Agency for International Development

JUNE 1974



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A Report from The Agency for International Development

Daniel Parker, AID Administrator
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'An Indispensable Element'

President Nixon's Message to the Congress on Foreign Assistance April 24, 1974

For more than 25 years, America has generously provided foreign assistance to other nations, helping them to develop their economies, to meet the humanitarian needs of their people, and to provide for their own defense.

During this era foreign aid has become an indispensable element of our foreign policy. Without it, America would risk isolating herself from responsible involvement in an international community upon which the survival of our own economic, social, and political institutions rests. With the continuation of a healthy foreign aid program, this Nation can continue to lead world progress toward building a lasting structure of peace.

Now that we have ended the longest war in our history and no American troops are serving in combat for the first time in more than a decade, there is a temptation to turn inward, abandoning our aid programs and the critical needs facing many of our friends in the process.

We must not succumb to that temptation. If we lay down the burden now, we will foreclose the peaceful development of many of the nations of the world at the mercy of powerful forces, both economic and political. Moreover, we will deny ourselves one of the most useful tools we have for helping to shape peaceful relationships in the most turbulent areas of the world.

Many of the nations which were once dependent upon our direct assistance for their survival are now managing their own economic and defense needs without our aid. Those nations which still need our aid will not need it indefinitely. We expect those nations we help to help themselves. We have made it clear that we do not intend to be the world's policeman, that our aid is not a substitute for their self-reliance, and that we do not intend to do for others what they should be expected to do for themselves.

But as long as there are governments which seek to change the frontiers and institutions of other nations by force, the possibility of international conflict will

continue to exist. And as long as millions of people lack food, housing, and jobs; starvation, social unrest, and economic turmoil will threaten our common future.

Our long-range goal is to create an international environment in which tolerance and negotiation can replace aggression and subversion as preferred methods of settling international disputes. While this goal is not as distant as it once was, present circumstances do not now permit reduction in foreign assistance. We must not only maintain our efforts, but also make special efforts in two critical areas of the world—the Middle East and Indochina.

In the Middle East, we have an opportunity to achieve a significant breakthrough for world peace. Increased foreign aid will be a vital complement to a negotiated settlement which will serve the interests of both Israel and the Arab nations.

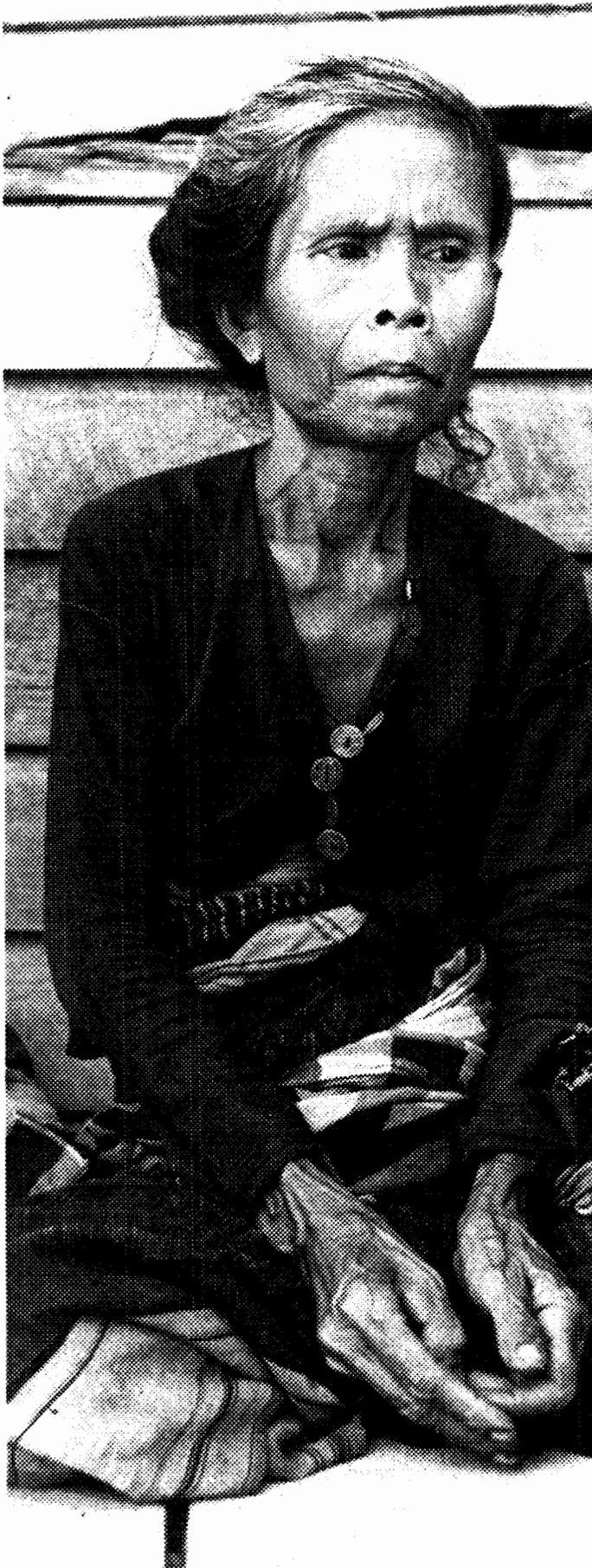
In Indochina our assistance is no less critical. South Vietnam, Cambodia, and Laos are trying to make the difficult transition from war to peace. Their ability to meet their defense needs while laying the foundations for self-sustaining social and economic progress requires continued and substantial amounts of American aid.

To meet these continuing and special needs, I am proposing to the Congress a total foreign aid budget of \$5.18 billion for fiscal year 1975. In my judgment, these amounts represent the minimum which the United States can prudently afford to invest if we are to maintain the present degree of international equilibrium and advance our efforts to construct a durable peace with prosperity.

Toward Peace

In the Mideast

The hope for a lasting solution to the Arab-Israeli dispute is stronger today than at any time in the previous quarter century. American diplomatic initiatives have helped create the conditions necessary for an end to conflict and violence. While our diplomatic efforts must and will continue, there is already much that



Resettling refugees in Laos is a major task. U. S. assistance is essential in helping the country reconstruct its economy.

can be done to supplement and consolidate what has been achieved so far. I am therefore requesting a Special Assistance program for the Middle East to advance our efforts in two major areas.

To maintain the momentum of our efforts in the Middle East, I have asked the Congress to provide the following:

- For Israel: \$50 million in security supporting assistance and \$300 million in military credit sales. Israel's continued ability to defend herself reduces the prospect of new conflict in the Middle East, and we must continue to assist her in maintaining that ability.
- For Egypt: \$250 million in supporting assistance. These funds would be used for the tasks which come with peace: clearing the Suez Canal, repairing the damage in adjacent areas, and restoring Egyptian trade.
- For Jordan: \$100 million in military assistance grants, \$77.5 million in security supporting assistance, and \$30 million in military credit sales. Jordan has been a moderating force in the Arab world and these funds will enable her to maintain a position of moderation and independence which will be crucial to a permanent settlement in the area.
- For a Special Requirements Fund: \$100 million. This fund will be used for new needs that may arise as the outlines of a peaceful settlement take shape, including provision for peace-keeping forces, refugee aid or settlement, and development projects.

All of this aid will contribute to the confidence these nations must have in the United States and in their own security if they are to have the base from which to negotiate a lasting settlement. It will strengthen moderate forces in an area where only moderation can form the basis for a settlement acceptable to all.

Toward Reconstruction Of Indochina

Another area of acute and continuing concern to this government is Southeast Asia. Our aid in Indochina is no less crucial than our aid in the Middle East in achieving a peaceful outcome which protects our interests and reflects our past involvement in these two areas. I am asking the Congress to authorize the appropriation of \$939.8 million to assist South Vietnam, Cambodia, and Laos in their efforts to shift their economies from war to peace and to accelerate the reconstitution of their societies.

We have already invested heavily in these countries. Progress has been significant, and we are nearing success in our efforts to assist them in becoming self-sufficient. Although our total request is higher than last year, the budget I am proposing is actually austere. We must recognize that a modest increase in

(Continued on p. 15)

'A New Commitment'

Excerpts from Secretary of State Kissinger's Address to the sixth special session of the United Nations General Assembly on April 15, 1974

The great issues of development can no longer be realistically perceived in terms of confrontation between the haves and have nots or as a struggle over the distribution of static wealth. Whatever our ideological belief or social structure, we are part of a single international economic system on which all of our national economic objectives depend. No nation or bloc of nations can unilaterally determine the shape of the future.

If the strong attempt to impose their views, they will do so at the cost of justice and thus provoke upheaval.

If the weak resort to pressure, they will do so at the risk of world prosperity and thus provoke despair. . . .

The organization of one group of countries as a bloc will sooner or later produce the organization of the potential victims into a counterbloc.

The contemporary world can no longer be encompassed in traditional stereotypes. The notion of the northern rich and the southern poor has been shattered. The world is composed not of two sets of interest but many: developed nations which are energy suppliers and developing nations which are energy consumers; market economies and non-market economies; capital providers and capital recipients.

For the first time in history mankind has the technical possibility to escape the scourges that used to be considered inevitable. Global communication ensures that the thrust of human aspirations becomes universal. Mankind insistently identifies justice with the betterment of the human condition.

The fundamental challenge before this session is to translate the acknowledgement of our common destiny into a new commitment to common action, to inspire developed nations alike to perceive and pursue their national interest by contributing to the global interest. The developing nations can meet the aspirations of their peoples only in an open, expanding world economy where they can expect to find larger markets, capital resources, and support for official assistance. The developed nations can convince

their people to contribute to that goal only in an environment of political cooperation.

On behalf of President Nixon, I pledge the United States to a major effort in support of development. My country dedicates itself to this enterprise because our children must not live in a world of brutal inequality, because peace cannot be maintained unless all share in its benefits and because America has never believed that the values of justice, well-being, and human dignity could be realized by one nation alone.

In this spirit of describing the world as it is, I would like to identify for the Assembly six problem areas which in the view of the United States delegation must be solved to spur both the world economy and world development. I do so not with the attitude of presenting blueprints but of defining common tasks to whose solution the United States offers its wholehearted cooperation.

• **First, a global economy requires an expanding supply of energy at an equitable price.**

No subject illustrates global interdependence more emphatically than the field of energy. No nation has an interest in prices that can set off an inflationary spiral which in time reduces income for all.

Consumers must understand the desires of the oil producers for higher levels of income over the long-term future.

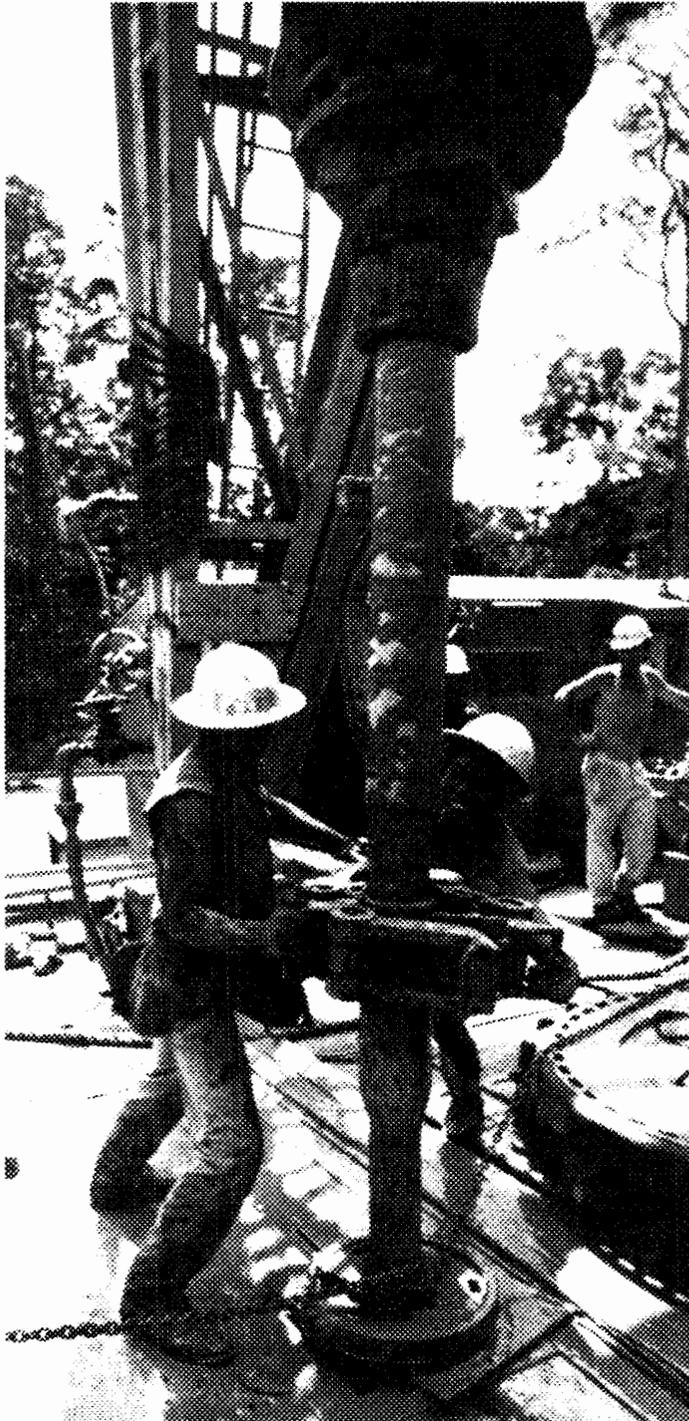
Producers must understand that the recent rise in energy prices has placed a great burden on all consumers, one virtually impossible for some to bear. . . .

Such a program cannot be achieved by any one group of countries. It must draw on the strength and meet the needs of all nations in a new dialogue among producers and consumers. In such a dialogue the United States will take account of the concern of the producing countries that the future of their peoples not depend on oil alone. The United States is willing to help broaden the base of their economies and develop secure and diversified sources of income. We are prepared to facilitate the transfer of technology

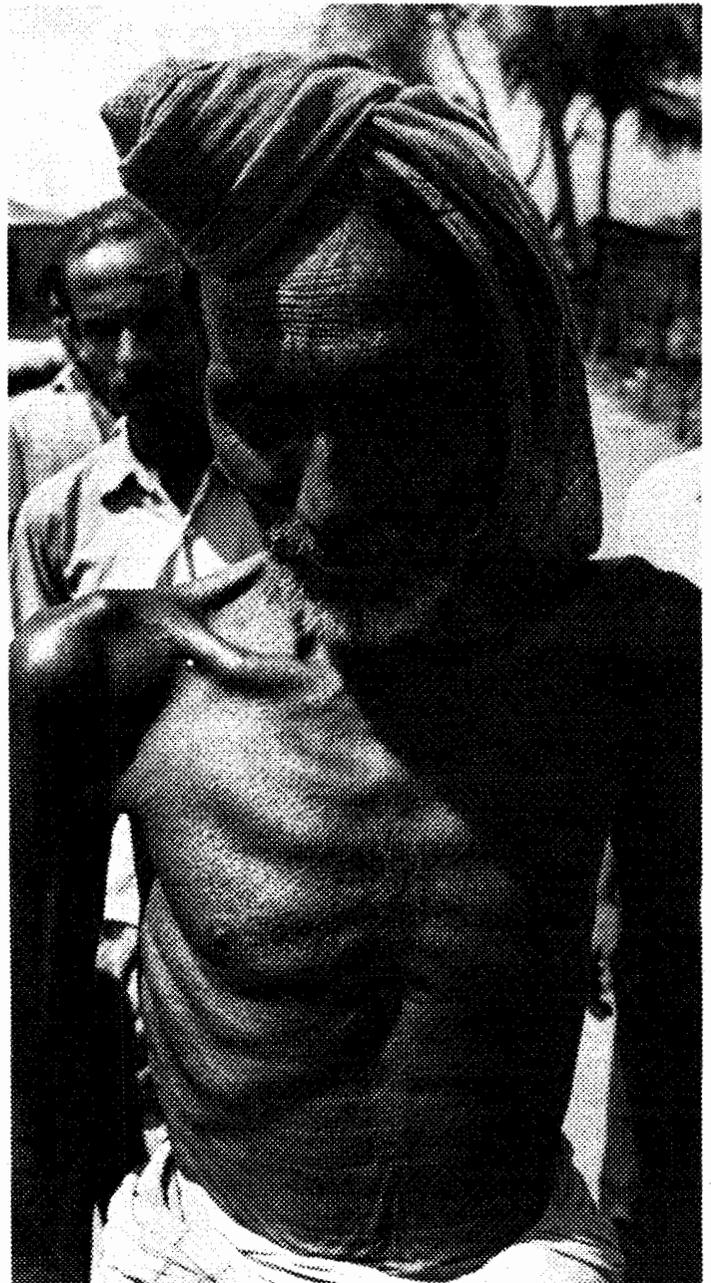
and assist industrialization. We will accept substantial investment of the capital of oil producing countries in the United States. We will support a greater role for the oil producers in international financial organizations as well as an increase in their voting power.

- Second, a healthy global economy requires that both consumers and producers escape from the cycle of raw material surplus and shortage which threatens all our economies.

For the first time in history it is technically within our grasp to relate the resources of this planet to



Drilling for oil in Indonesia—an expanding supply of energy at an equitable price is of critical importance to all nations.



Hunger and unemployment remain the two most fundamental problems confronting the peoples of the developing countries.

man's needs. The United States therefore urges that an international group of experts, working closely with the United Nations division of resources, be asked to undertake immediately a comprehensive survey of the earth's non-renewable and renewable resources. This should include the development of a global early warning system to foreshadow impending surpluses and scarcities.

- Third, the global economy must achieve a balance between food production and population growth and must restore the capacity to meet food emergencies.

A condition in which one billion people suffer from malnutrition is consistent with no concept of justice.

No nation can deal with this problem alone. The responsibility rests with all of us. The developed

(Continued on p. 18)

THE FERTILIZER 'PANIC'



In determining their food production goals, many nations have assumed that fertilizers would be readily available at constant

prices. But present scarcities of fertilizer, linked with rising prices, may result in food production falling short of demand.

By D. L. McCune

The Tennessee Valley Authority pioneered in the research and application of chemical fertilizers, and today is recognized as the world's leading source of expertise in the field. Because of the intense interest in fertilizer as a key to the current food problem, WAR ON HUNGER asked D. L. McCune, Director of TVA's International Fertilizer Development Staff, to comment on this important subject. Dr. McCune's views are not necessarily those of the Agency for International Development.

At the front of any discussion about world food problems today is the latest news about fertilizers. Many nations have based their food production goals

on the assumption that fertilizers will be available in almost unlimited supply and at reasonable prices. But now there is panic because fertilizers are scarce and prices have skyrocketed. A common prediction is that massive famines are inevitable because we are running out of fertilizers.

For the next three to four years, there is reason for concern. The situation will be especially serious for countries relying heavily on fertilizer imports. In many cases, these are the same countries with the most critical food problems.

In the developing countries it is estimated that if the amount of fertilizer available fell short by 20 percent, grain production in these countries would be reduced about 5 percent. And this does not take into account



Failure to use fertilizer can result in poor crop growth and yield as illustrated by the center rows of corn. While the stalks of the

unfertilized corn measure only 7 inches, those of the fertilized plants on either side grew to 40 inches or more.

potential drought on a localized basis, and other adverse weather conditions.

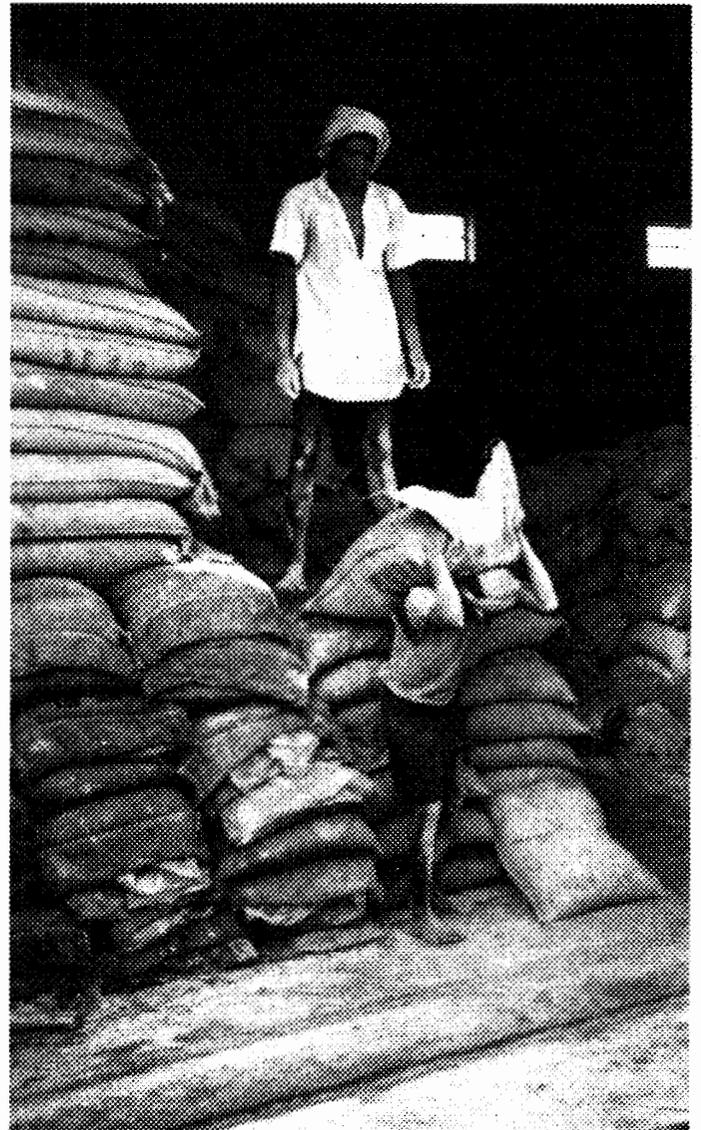
The short run outlook indeed is serious.

In the longer run, however, *the world need not starve due to a lack of fertilizers*. Known raw materials are adequate and technology exists to produce whatever fertilizer is needed. True, future prices will be higher than was common in the late 1960s and early 1970s, but they should ease somewhat as fertilizer supplies increase.

Reasons for Gloom

Certainly, there are plenty of statistics to justify concern. According to TVA estimates, world fertilizer consumption will reach 113 million metric tons by 1979/80, up from about 77.5 million tons in 1972/73. Average annual rates of increase will range from 8 to 11 percent in developing countries and from 4 to 8 percent in the developed countries. Although developing regions are expected to increase fertilizer use at a higher rate than the developed world, they will account for only one-fourth of total use by 1980. Actual increases in the developed world between 1972/73 and 1979/80 are expected to be 27 million metric tons and 10 million metric tons in lesser developed countries, where increased food production is vital.

In terms of specific plant nutrients, world nitrogen use will increase from about 36 million metric tons in 1972/73 to 57 million metric tons in 1979/80. The developing world (including developing Asia) is expected to use 18 million metric tons of nitrogen or 32 percent of the total. Phosphate use is expected to rise from about 23 million metric tons in 1972/73 to 31 million metric tons by 1979/80. Only 7.4 million metric tons or 24 percent of the total will be used in the lesser developed countries by 1980. Potash use now stands at 19.4 million metric tons and will reach



Developing nations which rely heavily on fertilizer imports may be particularly hard hit over the next three to four years.

25.6 million metric tons by 1979/80. The developing countries are expected to use only 14 percent of this 1980 total.

These requirements leave little room for rationalization. Resources must be developed and made increasingly available.

The nitrogen supply is unlimited because its source is the air we breathe. Seventy-eight percent of the air is nitrogen. Since the principal building block for nitrogen fertilizers is ammonia (NH_3), a source of hydrogen is the critical factor. Even with escalating prices, hydrocarbons based on natural gas or petroleum derivatives remain the only economical source of hydrogen based on present technology. Other potential sources, but still much more expensive, are coal or water.

There must be more nitrogen production to meet the need for nitrogen. The United States, Japan, and Western Europe have been the primary producers of nitrogen fertilizer and have dominated the world nitrogen trade. But since these are the areas where the energy crisis is most critical, they are becoming less dependable sources for developing nations. Oil and gas-rich areas—such as the Persian Gulf, North Africa, U.S.S.R., Indonesia, Bangladesh, Nigeria, Venezuela, Ecuador, and Canada—must now produce nitrogen for countries with limited natural gas or petroleum.

World phosphate trade (rock phosphate or finished phosphatic fertilizers), has relied heavily upon Morocco and the United States. Both have the potential

for expansion. Price of phosphate rock in the past six months has tripled from Morocco and doubled from the United States. Other potential producers and exporters, such as Australia, Peru, Angola, Spanish Sahara, and Jordan, need to be encouraged to meet increasing demand to provide alternate sources and reduce shipping distances.

Sulfur, one of the most plentiful elements in nature, is also essential for phosphatic fertilizer production. It is mined as elemental sulfur and as sulfur-containing minerals. Also, byproduct sulfur from smelting operations and sulfur extracted from natural gas and petroleum products are becoming increasingly important sources for fertilizer manufacture.

Potash production has been dominated by North America, Western Europe, and Eastern Europe. Although deposits in Canada and Eastern Europe can be expanded, new production points are needed to provide alternate sources and improved logistics to market. Potential producers appear to be Peru, Brazil, Thailand, and Ethiopia. There are expansion possibilities in the Congo.

AID Offer of Assistance

The Agency for International Development is keeping a close watch on the situation in the developing countries. A recent message to its missions offered assistance to those countries needing help in making fertilizer available to farmers. This assistance would be provided through AID's contract with the Tennessee Valley Authority, which, over the past decade

This South Vietnamese farmer no longer has to be convinced that fertilizer can increase his yield of potatoes. A "normal"

yield is shown on the right. The "extra" yield on the left was obtained with the use of fertilizer.



has provided technical assistance through its International Fertilizer Development Staff. AID also has a contract with TVA to perform research in fertilizers. One of the notable results of this work was the recent evaluation of sulfur-coated urea (SCU) in developing countries (see *War on Hunger*, January 1973).

Partly in response to the AID offer of assistance, TVA presently is swamped with requests for assistance from the developing countries. Among the developing countries where TVA teams have made, or are making fertilizer marketing or feasibility studies and in other ways helping in fertilizer production are Peru, Indonesia, Pakistan, Bangladesh, Philippines, Colombia, Ecuador, Ghana, Tunisia, and Central America.

Cause for Optimism

It is easy to overlook favorable signs during times of stress and uncertainty. But they are there. Traditionally, the fertilizer industry is a responsive industry, but there is danger of over-reaction leading to over-production. Such over-reaction in the late 1960s to the threat of famine in the mid-1960s is a major reason for the present shortages. Overbuilding of capacity for mining and production of fertilizers in the late 1960s caused prices to tumble. Older plants were closed and many dismantled and new plants were built at too slow a rate. This coupled with poor records on startup and poor production from plants in many developing countries permitted demand to catch up with production. Poor crop years in 1971 and 1972 with high prices for grains and other farm products unexpectedly increased fertilizer demand faster than the industry could satisfy it.

Fertilizer prices are now at an all time high and the industry is responding. *It appears that adequate capacity is being built to meet anticipated long-range needs.* In fact, caution may be needed to prevent the pendulum from swinging so far that production will again greatly exceed demand.

Need for Some Insurance

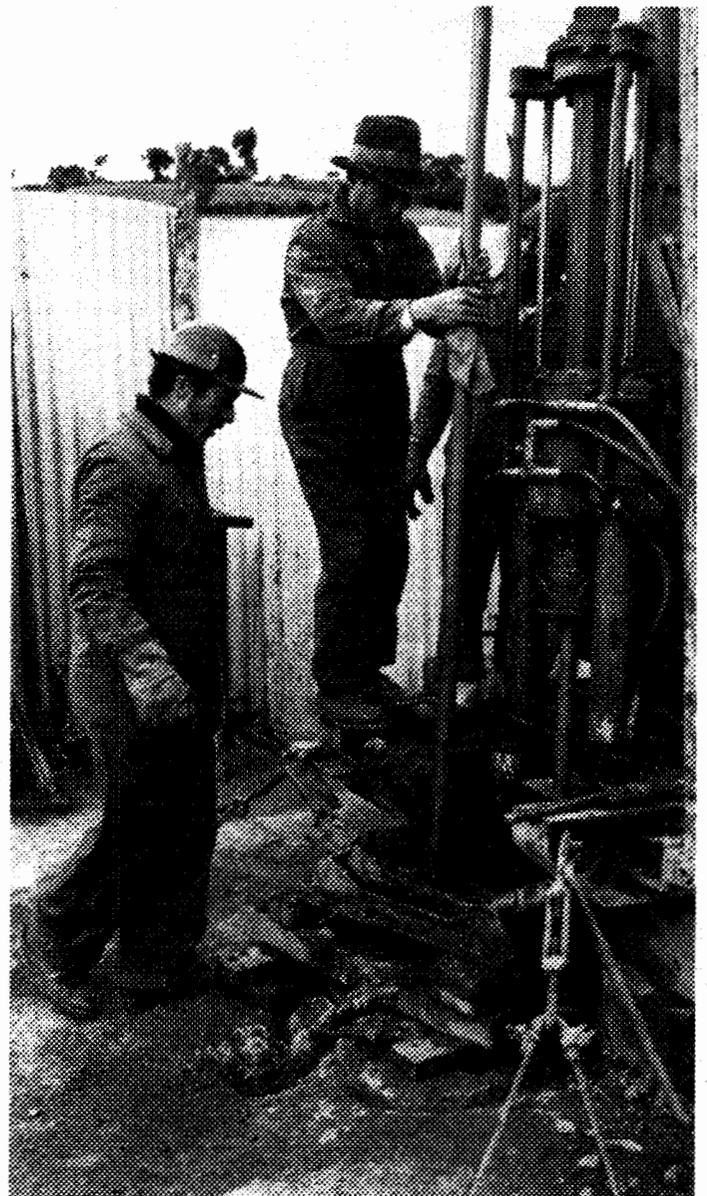
Increasingly, there seems to be a need for some insurance to help guarantee adequate food supplies. There is talk of the need for a world food bank. Others propose a world fertilizer bank. Both are noble gestures but fraught with problems. Another possible solution—and one that might be more workable—would be to bank fertilizer production capacity. During periods of oversupply, strategically located plants could be retired from production and placed in "mothballs" until the pendulum again swings the other way. This was done in effect in Canada when Saskatchewan limited potash production. It also is done by individual companies when they shut down their less efficient plants in times of surplus supply and low prices, then reopen them when the profitability has improved.

Surely we can anticipate by six months or a year when food supplies will be critically short. Standby plants can then quickly be brought back on-stream.

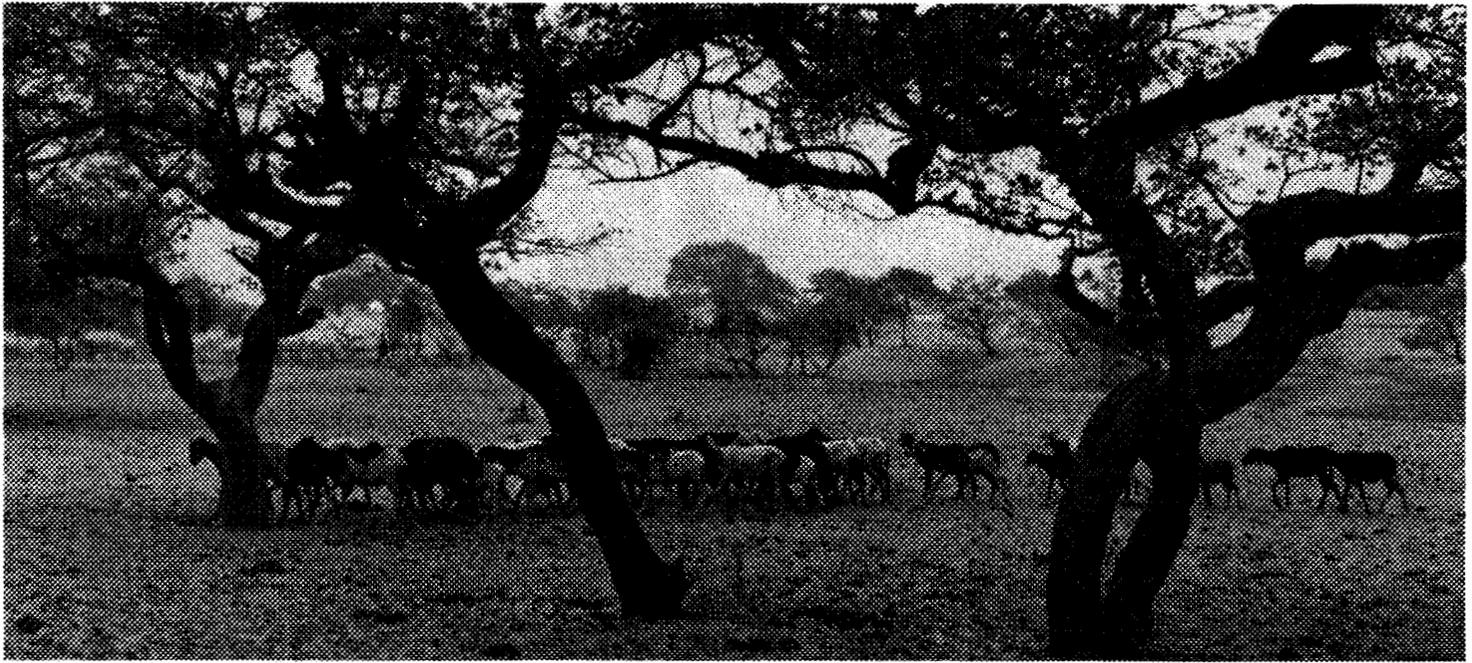
The same concept could extend to the basic resources part of the industry to keep it alive and productive. For example, phosphate and potash mines could continue to operate with the raw materials being shipped to and stored at key manufacturing locations throughout the world. Both phosphate and sulfur can easily be stockpiled.

To make such a bank work, some international body or the major countries must be willing to organize such a system. It probably would be no more costly or certainly less unwieldy than a world food bank, a world fertilizer bank or subsidizing farmers to not produce certain food and fiber crops.

Any such plan could successfully keep the fertilizer industry intact at all times, more closely match the supply with the demand, promote greater efficiency within the industry with resulting savings to the consumer, and help prevent world food levels from sinking to dangerously low levels.



Deposits of phosphate, an important source of fertilizer, were recently discovered in Colombia by an AID-financed survey.



The dry Sahelian weather of the past few years has helped produce widespread deterioration of the rangelands. Grasslands

have been overgrazed. The loss of vegetation and pastoral areas will continue unless action is undertaken soon to reverse the trend.

Can the Sahel Be Saved?

By Dr. N. H. MacLeod

This article is adapted from a paper presented at the March 22, 1974, Conference on the African Drought which was held at The American University in Washington, D.C. Dr. MacLeod, Senior Research Scientist in the Biology Department of American University, has been appointed Director of the National Aeronautics and Space Administration's special Drought Analysis Laboratory, which was set up in May 1973 at the Goddard Space Flight Center in Greenbelt, Maryland, in direct response to the West African drought. The views expressed in this article are Dr. MacLeod's and not necessarily those of the Agency for International Development.

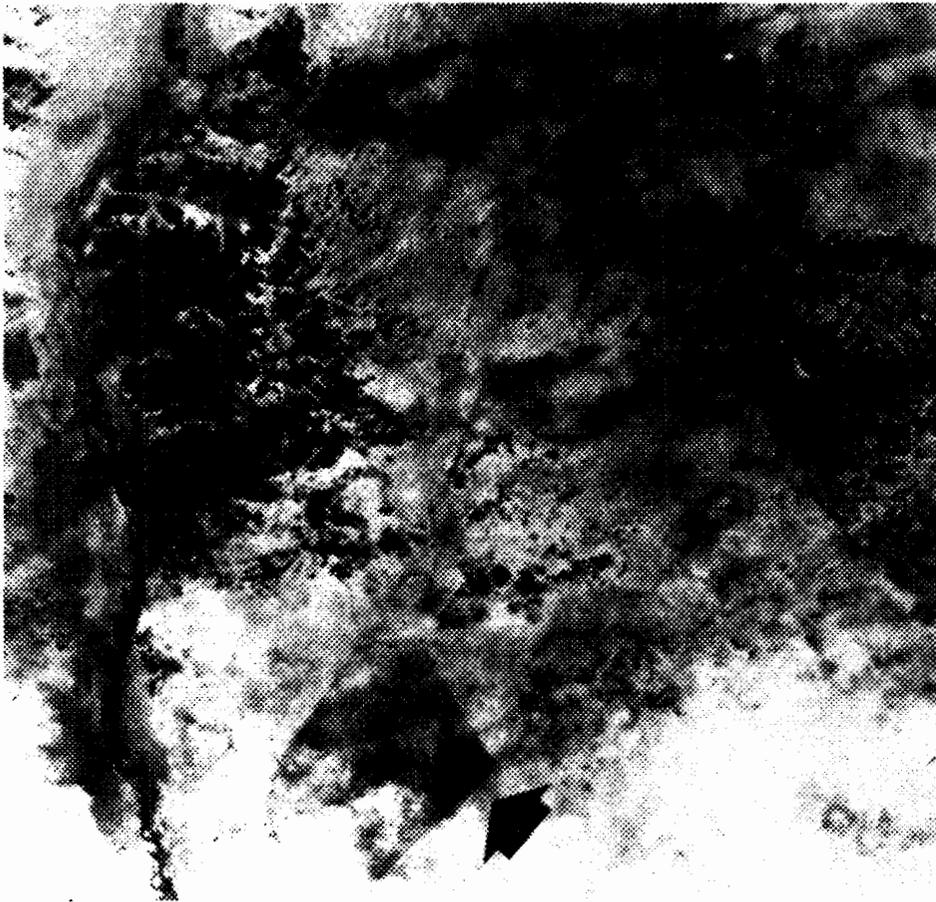
For six years now there has been increasing concern that the natural resources available to the people of West Africa are deteriorating rapidly to the point where serious questions of survival must be faced. For many nomadic herdsmen, skilled at exploiting the range resources of the Sahel, the questions of survival are now answered in the death of their cattle, sheep, and camels. Even their goats are dying. The nomads themselves are now dependent upon resources outside the Sahel for their survival.

Also, the farmers of the Sahel have suffered most difficult years of harvests. Drought and attacks by

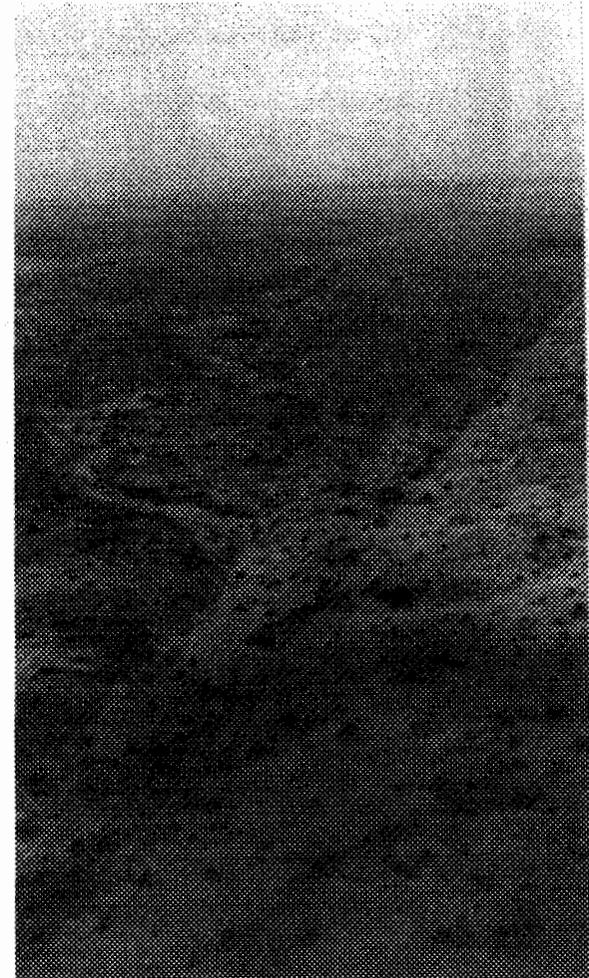
pests have reduced their yields of millet by half, and for some peasants now working marginal land, to nothing, despite repeated seeding of their crops. Farmers who formerly exported grains to neighboring countries now must depend on donations of food for survival. Each succeeding year is thought to be the last year of troubles. In Niamey, Niger, on March 15, this year, it rained twice and was cloudy most of the week. The people hoped that this meant the rains would come early and all would be well. But what are the odds that this could be true? Is the problem of deterioration of Sahelian resources to be answered by a change in the weather, or are other factors bringing the realities of famine to the Sahel?

Is the drought unique?

We know that there have been droughts in the Sahel in the past, particularly in the first and second decades of this century. But when the Niger River fell to record lows in 1973 at Bamako, Mali, the record that was broken was one that has stood perhaps since the 14th Century. It appears that this year, 1974, new record lows will be established because the flood crest passed through Niger two months early in December rather than February. While droughts *per se* may not be unique, certainly this drought is extraordinarily severe and prolonged.



This large quarter million acre ranch in Niger is shown clearly on an ERTS image from an altitude of 500 miles. The darker tone indicates the presence of vegetation.



A helicopter view of the same area indicates no difference between the range and its surroundings.

Why is there so little rainfall?

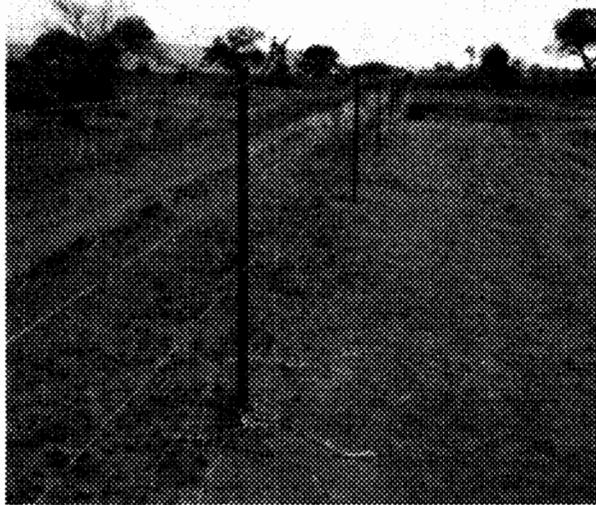
To provide a definitive answer is too ambitious. But there are some hypotheses related to the global circulation of the atmosphere and the effects of atmospheric dusts, principally from volcanic eruptions and explosions like Krakatoa, which hypothesize cooling trends and a southward shift in the northern hemisphere of major climatic zones. The cold air mass standing over the poles expands. Increasing amounts of atmospheric dust appear to be well correlated with the size of annual accumulations of Greenland ice. Of course, industrial smokes, smoke from fires and from volcanic eruptions are present in our atmosphere most of the time, increasingly as industrialization continues. Has their introduction into the atmosphere reached a critical point? (We find weather disturbances worldwide.) Is the Sahel itself a significant source of dust? A National Oceanic and Atmospheric Administration report issued by the U.S. Department of Commerce in January 1974 indicated the persistent presence of a broad band of dusts moving across the Atlantic Ocean from Africa toward

the Caribbean. This dusty inversion layer, which is some 16,000 feet thick reduces solar radiation at the surface by 25 percent and suppresses the normal exchange of energy and the formation of cumulus cloud, interrupting the normal evaporation and movement of water from ocean to atmosphere.

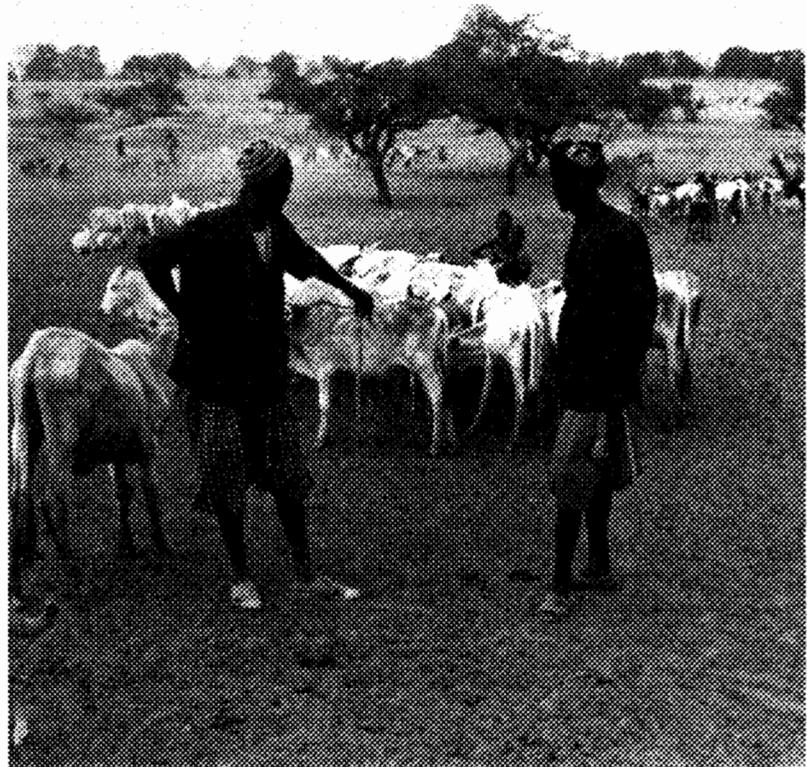
Smoke-colored Clouds Over Africa

Last winter the crew of Skylab 3 saw large areas of smoke-colored clouds over Africa, clouds moving out of central Africa, moving out of the northern part of Africa into the Atlantic Ocean, and moving out of East Africa into the Indian Ocean. The astronauts associated this cloudiness with widespread burning, although their description also indicates massive amounts of dust in the atmosphere of the Sahel moving on a continental scale into the two major oceans. If dust affects the weather on a global scale or a local scale, then Sahelian weather is affected by dusts.

The dry Sahelian weather of the past few years is associated with widespread deterioration of the range, lowering of water tables, and grain-crop failures. Each year since 1968, the situation seems worse; last



A close-up view shows that revegetation, made possible by controlled grazing, accounts for image differences.



Desertification in the Sahel has resulted in the loss of cattle, sheep and camels, the mainstay of life for large numbers of herdsmen.

year being perhaps twice as bad as the year before.

If dust is the major factor in producing this change in the weather, and the Sahelian dusts arise from normal climatic fluctuations in the Sahel not influenced by human activity, the Sahel is doomed. There is nothing we can do but save the people by the evacuation of 20 million refugees, already destitute and unwanted.

The critical assumption that would lead to this conclusion is that this desperate drought in the Sahelian countries is altogether normal, that this has happened in the past and that it will happen again. I do not agree with this analysis. It is my view that the situation is very abnormal, quite destabilized ecologically as well as socially, and that deterioration has resulted from political and social events in the not-too-distant past, events recorded by African historians, and now by Europeans as well. Further, I believe that re-stabilization—or rehabilitation of the Sahel—is possible, and I base that belief on evidence well-known to most of us. Further still, it is my opinion that any development projects which do not include rehabilitative principles in the program are going to

fail by rejection from the Africans or by nature's determination to do it her way, or not at all.

One of the first pieces of evidence is the past. Leo Africanus traveled in the Sahel in the 16th Century—a time of intense cold in Europe. (According to the dust hypothesis intense cold in northern latitudes should result in a shift southward of the desert zone.) Leo traveled from Timbuktu to Gao then straight to Agadez along the present northernmost border of the Sahel. He praised the richness of the land, as well as the industry of its farmers. The land was vegetated, the rainfall adequate for agriculture. The Bournu Empire, centered near Lake Chad, grew and expanded into the Sahel during the 15th and 16th Centuries—a time of increasing cold in Europe. It lasted several centuries until overtaken by the sweep of conflict from the Senegal Basin.

In our trips to the Sahel we asked the elders of Niger about the vegetation of 50 or 25 years ago. In one instance, we were looking into sandstorms near Agadez blowing across a blazing hot desert. Twenty-five years ago, the elders told us, there were forests

where we were standing awash in a sea of sand. A dramatic change must have occurred in the Sahel in rather recent time. Desertification (the loss of vegetation in an increasingly arid climate) is proceeding now at an accelerated pace and will continue into the distant future unless action to reverse this trend is taken immediately. An important question is why is vegetation lost and can it be replaced? These are not simply ecological questions, but rather thorny physical and social questions as well.

While rainfall and other climatic factors vary annually and quite extremely in the Sahel, there appears to have been considerable social adaptation to just this environmental variety. The people of the Sahel, however, through pre-colonial, colonial, and post-colonial social upheaval, have lost control of their resources—their access to rangelands, the wells, their traditional means of maintaining animal and human health. The Touareg, for example previously controlled access to wells in the Sahara and the pastoral Sahel as well as access to the rangelands. They did so by strong military force. They controlled sites that were reserved for times of drought. Their cattle were *not* protected from disease, nor were they, themselves. Since the 19th Century, however, the European military superiority deprived the Touareg of their means of control of range and wells—the essentials of their manner of managing their resources. Others now exploited these resources.

Competition for Control of Resources

Further, their cattle became in time protected from numerous diseases. Not surprisingly, the Touareg's remaining controllable resource, their herds, were greatly increased in number. Surprisingly, the Touareg themselves have not increased greatly in population. But sustaining a maximum number of animals was now essential to Touareg survival, particularly in bad times, and for the Touareg this century has been a disaster. No longer able to manage the range resource, the Touareg and others have joined in a race to get to the forage first. As overgrazing ensued, the pursuit for good pasture included larger areas where nomads met and mingled with people from the south who were seeking arable land. In several places in the Sahel this competition for control of essential resources must be called war. In this competition, not only have grasses been overgrazed, but many trees have been destroyed for both fodder and fuel.

The situation is similar in other pastoral areas. Desertification is not a simple loss of wilderness or something esthetically displeasing to our eyes.

What happens in a climatic sense when vegetation is removed? Wind speeds at the soil surface increase, increasing the deflation or removal of fine soil particles and increasing the rate of water evaporation. Barren soil surfaces are much hotter in daytime and cooler at night, heating and cooling more rapidly than vegetated surfaces.

The microclimate of devegetated areas is drier, hotter, colder at night, windier, dustier, and less prone to precipitation. Furthermore, precipitation which does occur tends to run off the surface instead of penetrating, making rainfall less effective. Fine particles, those most important to soil fertility, are removed by deflation in moderate winds. Sands begin to blow in the higher speed winds. In sum, the removal of vegetation is an initiating factor in the process of desert formation. That process can be said to occur wherever vegetation is removed, by over-grazing, by repeated firing, by overcultivation, or unsuccessful cultivation as well as by deforestation for fuel or fodder.

Methods for Survival

As the people of the Sahel lost primary control of their resources, they adopted methods of survival that have led to the destruction of the very resources on which their survival depends. To be sure, total destruction has not yet occurred, but the process is going forward throughout West Africa. Families in sedentary zones, searching to assure themselves of sufficient grains to survive, no longer allow sufficient fallow time for recovery of soil fertility. They now cultivate marginal lands with little or no return and there is concern that even with the return of normal rainfall there will be substantially reduced yields from rain-fed agriculture.

This admittedly is a Malthusian picture, relieved only by relief programs from countries all over the world and the utmost efforts of the Sahelian Governments. These are programs carried on under the most difficult conditions of transport, in a global situation of declining capability for sufficient food production, and carried to a region whose lost resources seem irrecoverable.

This situation is neither normal, nor inevitable. Social factors have interacted in the Sahel, leading to loss of control of resources by indigenous people. In their struggle for survival, the people are destroying their resource base. This destruction has been particularly rapid during this extended period of drought—and the drought may well be more intense because of the destruction, a vicious cycle which must be broken if the Sahel is to survive.

What are the possibilities of restoring the Sahel to a condition in which a satisfactory level of human life can be sustained? Water, of course, is a vital resource. In addition to the rivers of the Sahel, there are underground water resources.

At a recent UNESCO meeting of African specialists (with delegations from eight Sahelian countries), a Director of the Center for Water Resources Studies (CIEH), an international center serving 13 African member countries in Ouagadougou, Upper Volta, stated that ground water resources were widespread and adequate for human and animal consumption, as well as some irrigation. While I feel it is very risky

to base development programs on fossil ground water supplies, his report is reassuring. Our space imagery has led us to suggest that annually recharged near-surface water resources are also available in the dry river beds of the Sahel. In these one also finds excellent soils for irrigation.

What about vegetation? Our imagery has also led us to a large ranch in Niger which is deserving of attention because in this ranch we have seen the potential of managed grazing in the Sahel. A photograph of the ranch by satellite shows that the ranch is located in a region of dunes with little surface water, but that something is different about the land surface giving rise to a different tone in the image. A second photo, taken from a helicopter, shows that indeed there is no geomorphic difference between the range and its surrounding, that a fence line marks the differing tones. A third photo points out that the difference is due to revegetation inside the ranch. There are many grass and tree seedlings inside the fence line, grasses which are more vigorous and have been allowed to go to seed. Closer inspection of soil conditions showed us that only a few millimeters of loose sand were above a silty thin crust on the inside of the ranch, but several centimeters of loose sand were above a hard pan in the soil outside the ranch. In the five years in which the ranch has been fenced and managed, a recovery has occurred—in this ranch the desert has been reversed.

If this can be done, why is it not done more often? At a recent UNESCO meeting, Sudanese delegates discussed their experience with enclosed managed

grazing areas—of large scale in areas and numbers—and recommended further expansion of this practice in the Sahel. This recommendation was accepted by all the African delegates.

Why has this not been done? Because it doesn't pay—it doesn't pay in terms of Western market economics. But economists do not usually consider in their analyses the social costs of not taking rehabilitative actions—what the social as well as monetary costs and benefits might be.

Stabilizing the Ecology

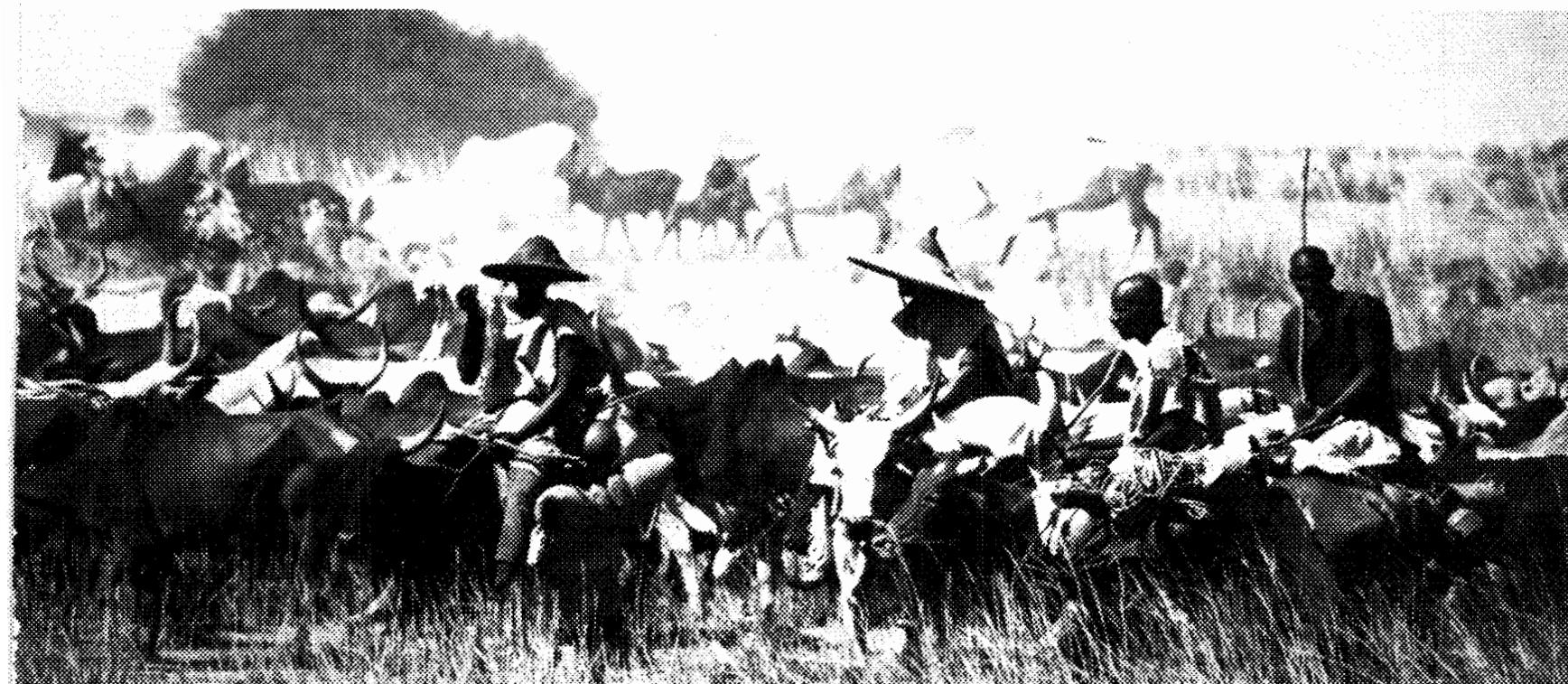
What can be done?

There are three major action categories:

First, the establishment of controlled grazing in large areas of the pastoral region of the Sahel. Space imagery can be used to provide a resource inventory of the pastoral zone, incorporating as well information from past studies.

Second, in the zone of contact between pastoral and agriculture, a mixed form of agriculture is envisioned—livestock production plus rain-fed and irrigated crop production.

Third, something must be done to control the deterioration of cultivated soils in the sedentary zone. Expansion pressure of cultivated areas to the north and into marginal areas can be relieved by introduction of more mixed cropping—changing from monoculture to a cropping system in which more than one crop is grown at the same time. The use of cowpeas in millet is a start in this direction. So is the use of irrigation where this practice is feasible. By feasible I mean where the people and the government can



Controlled grazing is one major step recommended by the author for saving the Sahel. ERTS can play a vital role in such

programs by using space imagery to provide a resource inventory of the pastoral zone.

develop water resources and soil resources themselves with information and scientific data from external sources.

The basic philosophy is to incorporate principles of ecologic stability into development programing, to restore control of resources to Sahelian people, to utilize the people's capital, their labor, as fully as possible. New technologies, such as space imagery for integrated resource survey, resource management information systems for use by Sahelian planners, new varieties of grains to improve the nutritive value of

Sahelian crops, new technologies brought to the Sahel, new sources of energy from sun and wind, are critically needed in the Sahel. We also are trying to understand these new technologies which are revolutionary in our own Western societies. We are trying to learn with the Africans how they can best be applied in Africa.

I am optimistic about the recuperative powers of the people of the Sahel and about the rehabilitation of their resources. With adequate and proper assistance they can save the land and themselves. 

AID's Role in Remote Sensing

Remote sensing from satellites is a technology which is particularly promising as a development tool. As Dr. MacLeod implies in the accompanying article, it can be directly applicable to the world food problem.

Since the launch of the first Earth Resources Technology Satellite (ERTS-1) in July 1972, most land areas of the world have been surveyed by remote sensing methods. Through the experimental program of the National Aeronautics and Space Administration and the satellite image distribution facilities of the U.S. Geological Survey, it has been possible for developing countries to obtain access to these valuable data at very low cost.

Assisting in ERTS Applications

The Agency for International Development has responded in several ways to the interests of developing countries in applications of remote sensing and the utilization of ERTS technology in solving a variety of development problems. A number of countries have been assisted in participating with NASA in the ERTS program and in training in uses of the satellite imagery.

Regional workshops have been held in the Philippines, Thailand, Panama, Mali, and Kenya to introduce the benefits and applications directly into the regions where the needs are the greatest. In addition, an international workshop was held at the EROS Data Center in Sioux Falls, South Dakota, in 1973 and another from May 30—June 28, 1974. Aircraft experiments have been conducted in Indonesia to

demonstrate the utility of remotely sensed data from aircraft as well as from satellites.

AID is also sponsoring a benefit assessment study, scheduled for completion in June, to review and report on ERTS experiments which have been conducted in developing countries and to identify those applications where potentially significant economic benefits may be derived from participation in remote sensing programs. During fiscal 1975 AID's Office of Science and Technology will support a number of developing country experiments using ERTS imagery in the fields of agriculture, range management, hydrology, cartography, geology, and geography. These case studies will define more clearly the priority applications for remote sensing and will outline specific procedures which developing countries may take to benefit from utilization of ERTS technology and subsequently to improve their standard of living.

Another important activity which AID has undertaken jointly with the U.S. Bureau of the Census, is an experimental project designed to evaluate the usefulness of ERTS imagery in census studies. Project agreements have been signed with the governments of Afghanistan and Kenya (see page 21) designed to determine effective means for using satellite imagery for census mapping and monitoring population change in rural and urban areas. A significant aspect of this work involves the assessment of population distribution in rural areas in relation to agricultural land use. 



Economic reconstruction assistance for South Vietnam includes aid for refugee resettlement schemes that will give children

like these a home again. AID also is providing food and funds to help orphans, widows, and persons disabled during the war.

'An Indispensable Element', from p. 2

economic assistance now will permit the development of viable, self-supporting economies with lower requirements for assistance within a few years.

The South Vietnamese face an unusually difficult task in reconstructing their economy and caring for their war-torn population even as the effort to end hostilities goes forward. Progress in reconstruction, economic development, and humanitarian programs, which offer the hope of a better life for the people there, should make it clear that a peaceful settlement of political disputes is in the interest of all.

This year and next the South Vietnamese face several related challenges which make increased U.S. economic assistance essential:

—They must resettle more than a million refugees and displaced persons.

—They must provide the investments needed to create productive jobs for the several hundred thousand who have lost jobs with the withdrawal of U.S. forces.

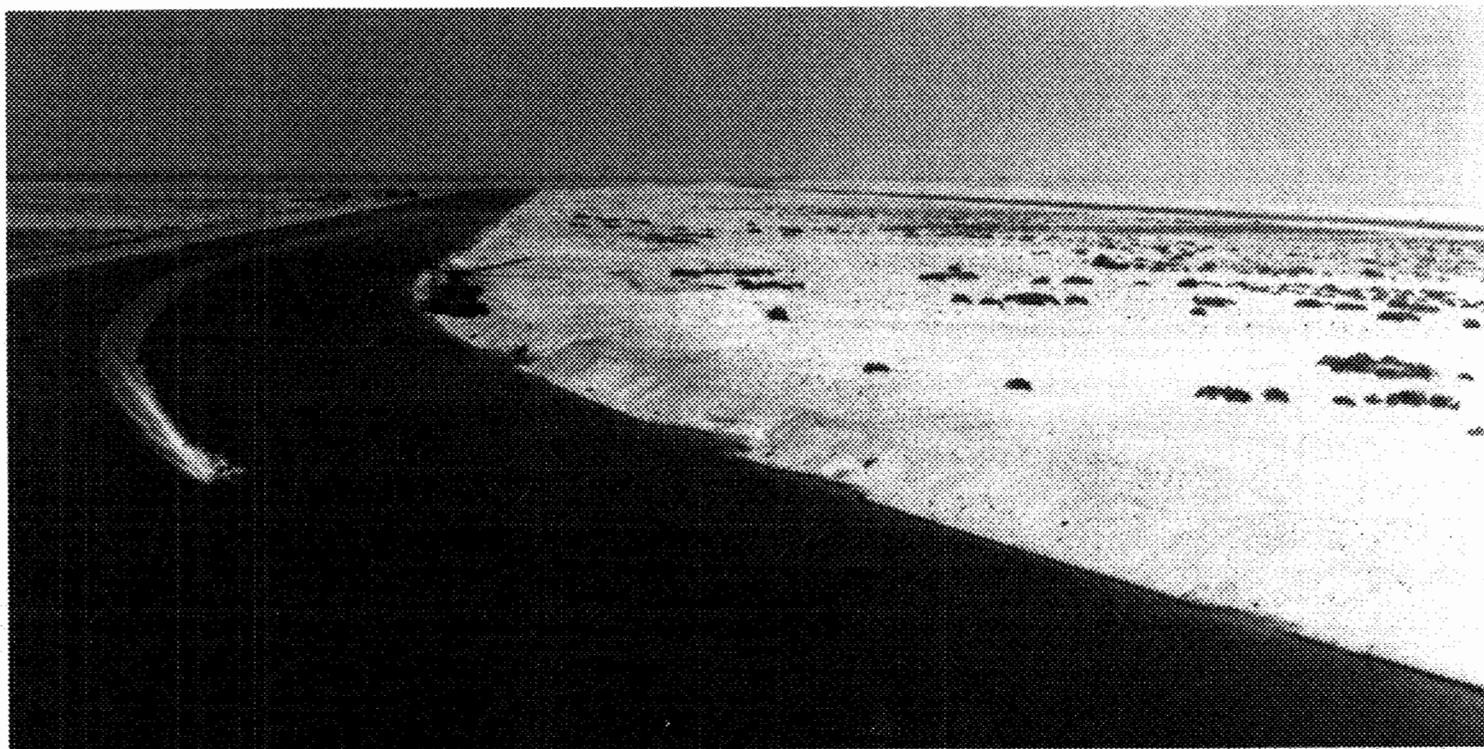
—They must meet the much higher costs of such essential imports as fertilizer and other critical resources caused by worldwide inflation.

—They must provide for the orphans, the disabled, and for widows who can never recover their wartime losses.

—They must continue to support the military forces needed to preserve movement toward peace so long as hostile forces continue to be deployed within South Vietnam and supported from outside.

The South Vietnamese have made laudable efforts to solve their own problems. They have increased their taxes—a 40 percent increase in real terms in 1973. They have expanded their exports, which were virtually eliminated by the war—doubling exports in 1972 and again in 1973. They have sharply reduced the consumption of imported goods, including a notable reduction in petroleum. But after more than a decade of war, they cannot reconstruct their economy and their society alone. Increased U.S. assistance is needed now to support the increasing efforts of South Vietnamese to achieve peace and self-sufficiency as soon as possible.

In Laos, a peaceful political solution to the conflict is in motion and the people there can finally look forward to a secure and stable environment. The problems of resettling refugees and establishing a viable economy, however, will provide a major test of the Laotian Government's ability to work in the interests of all. Our continued assistance is essential to permit this underdeveloped, land-locked country to reconstruct its economy after so many years of war.



A U.S. Navy helicopter tows a minesweeping sled along the Suez Canal in operations financed by AID. Along with other countries,

the United States is providing aid for countries in the Middle East in an effort to achieve peace in that area of the world.

Continued U.S. assistance is also essential to alleviate the hardships facing the Cambodian people, many of them refugees with little opportunity to support themselves until hostilities subside.

The investment I am now seeking—an investment to sustain the peace, to overcome the human suffering resulting from the war, and to give the people of Indochina a chance to stand on their own feet—is small in comparison with what we have committed over the years in Indochina. But the potential return on this investment is large in enhancing the prospect of peace both in Indochina and around the world.

Development Assistance

U.S. assistance programs—both bilateral and multi-lateral—have made a very substantial contribution to the economic growth of the developing nations over the past decade.

In spite of encouraging progress, it is estimated that 40 percent of the total population in all the developing countries still remain trapped in conditions of poverty beyond the reach of the market economy. These people continue to exist below minimal levels of nutrition, literacy, and health.

It is clear that in the modern world, peace and poverty cannot easily endure side by side. In the long term, we must have peace without privation, or we may not have a durable peace at all. All that we have worked, and fought, and sacrificed to achieve will be

in jeopardy as long as hunger, illiteracy, disease, and poverty are the permanent condition of 40 percent of the populace in developing nations of the world. But the progress which we have been able to help bring about thus far demonstrates that this need not be a permanent condition. Our developmental assistance continues to be needed to maintain and expand this record of progress.

To provide this needed assistance I am asking the Congress to authorize for fiscal year 1975 the appropriation of \$255.3 million for functional development assistance programs in addition to the \$618 million already authorized by last year's Foreign Assistance Act.

These additional funds will permit the Agency for International Development to assist developing nations in increasing food production. The widespread hardship caused by recent pressures on world food supplies calls for greater efforts by all to raise agricultural productivity. Population growth combined with recent crop failures in many parts of the world have led to the lowest grain stock levels in many years as well as high prices. In some cases, famine is threatening entire populations, and the world shortage of food makes it difficult to provide the assistance needed to avert tragedy. But food aid alone does not provide a solution. Developing nations must increase their own agricultural productivity, and almost 60 percent of AID's development assistance programs will be aimed at achieving this goal.

We will continue to reorient our development assistance programs, as jointly endorsed by the Congress

and the Administration, to concentrate more directly on acute human problems in poor countries. AID will thus focus on providing family planning and basic health services, strengthening education and other human resource programs, increasing food production, and improving nutrition.

A strong bilateral U.S. foreign aid program can be fully effective, however, only if it is complemented by continued, active multilateral assistance efforts. Pending before the Congress is legislation to authorize United States contributions of \$1.5 billion to the International Development Association (IDA). Appropriations for those contributions will be spread over a number of years beginning in 1976.

The International Development Association has a 14-year history of excellence in providing development loans to the poorest nations. We have negotiated a reduction in the United States' share of the total contributions to IDA from 40 percent to 33 percent, thereby shifting additional responsibility for international lending to other nations. It is inconceivable that the United States should abandon such a successful international activity, and I urge the House of Representatives to reconsider its recent vote denying the IDA authorization. Such a step would constitute a false economy in violation of the very principles toward which we would hope to move in providing foreign development assistance.

Also pending is legislation to authorize contributions of \$362 million for the ordinary capital and \$50 million for the special resources of the Asian Development Bank (ADB). The performance of the IDA is being matched today by the newer Asian Development Bank. The African Development Fund of the African Development Bank has excellent prospects of playing an increasingly critical role in a continent whose need has been most recently highlighted by severe drought.

It is imperative that these authorizations as well as those for our bilateral programs be enacted. It is equally imperative that appropriations be enacted in the full amount necessary to fulfill our responsibilities in these institutions and in the Inter-American Development Bank, for which authorizing legislation has been enacted.

The United States is currently engaged in negotiations relating to international monetary and trade reform. It should be recognized that less developed nations will play an important role in the success of these important initiatives. These nations will look to the United States to continue our leadership in the development assistance field as well as in trade and monetary reform.

Security Assistance

The security of our allies and of nations friendly to us is an essential consideration in the foreign and

national security policies of the United States. Not all are capable of providing for their security, and our assistance enables those countries to assume primary responsibility for their own defense. It gives them the confidence to negotiate with potential adversaries from a position of strength and to resist subversion and intimidation. The effectiveness and wisdom of these policies is being proven today in the Middle East and Southeast Asia.

There can be no real peace in the world so long as some governments believe that they can successfully obtain by force or threat of force what they cannot obtain by peaceful competition or negotiation. Our security assistance programs reduce the likelihood that such calculations will be made and thereby increase the incentives to resolve international disputes by peaceful means.

Just as security assistance can ease the impact of large and unexpected defense burdens on the economies of friendly nations, it can also strengthen their economies and thereby allow a greater use of military sales credits as opposed to grants. We need a flexible military credit sales program to encourage and facilitate the self-reliance of friendly states and to help gradually reduce the cost to the United States of providing security assistance.

I am asking the Congress to authorize the appropriations for fiscal year 1975 of \$985 million for grant military assistance, \$555 million for foreign military sales credits to finance an \$872.5 million program, and \$385.5 million for security supporting assistance.

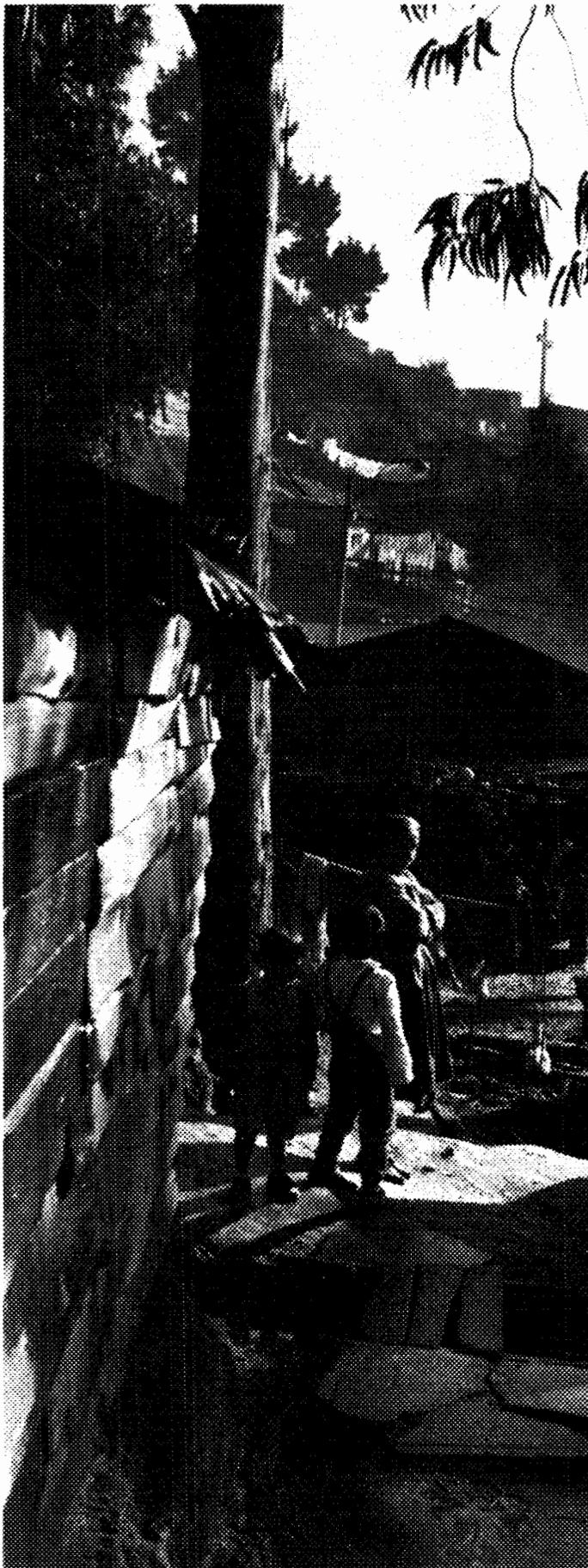
Conclusion

The United States has only recently emerged from more than a decade of direct involvement in a long, bitter, and costly war. It is not remarkable that we should see a strong sentiment in the land for giving up the difficult duties of world leadership. But temporary sentiment must not obscure the long-range interest of our Nation.

The percentage of America's Gross National Product dedicated to foreign assistance is small. It is less, indeed, than that of some other nations. But it is a wise investment, undertaken with bipartisan support in the interest of our own Nation, in the interests of our historical role as a generous and courageous defender of freedom and human rights, and in the interests of world peace.

With our assistance, other nations have reached a point where they can share this burden. But we have not yet reached the point where we can safely lay it down.

The amounts I am requesting for fiscal year 1975 are the minimum essential to support the responsible and constructive American role of international leadership and cooperation, a role which it is in our national interest to continue and strengthen. 



An inflationary world economy threatens a third of mankind with possible starvation and loss of their hopes for development.

'A New Commitment', from p. 4

nations must commit themselves to significant assistance for food and population programs. The developing nations must reduce the imbalance between population and food which could jeopardize not only their own progress but the stability of the world. . . .

—The United States is . . . prepared to join with other governments in a major worldwide effort to rebuild food reserves.

—We shall make a major effort to increase the quantity of food aid over the level we provided last year.

For the countries living near the margin of starvation, even a small reduction in yields can produce intolerable consequences. Thus the shortage of fertilizer and the steep rise in its price is a problem of particular urgency—above all for countries dependent on the new high-yield varieties of grain. The first critical step is for all nations to utilize fully existing capabilities. The United States is now operating its fertilizer industry at near capacity. The United States is ready to provide assistance to other nations in improving the operation of plants and to make more effective use of fertilizers.

But this will not be enough. Existing worldwide capacity is clearly inadequate to present needs. The United States would be prepared to offer its technological skills to developing a new fertilizer industry especially in oil-producing countries using the raw materials and capital they uniquely possess.

We also urge the establishment of an international fertilizer institution as part of a larger effort to focus international action on two specific areas of research: improving the effectiveness of chemical fertilizers, especially in tropical agriculture, and new methods to produce fertilizers from non-petroleum resources. The United States will contribute facilities, technology, and expertise to such an undertaking.

• **Fourth, a global economy under stress cannot allow the poorest nations to be overwhelmed.**

The debate between raw material producers and consumers threatens to overlook that substantial part of humanity which does not produce raw materials, grows insufficient food for its needs, and has not adequately industrialized. This group of nations, already at the margin of existence, has no recourse to pay the higher prices for the fuel, food, and fertilizer imports on which their survival depends.

Thus, the people least able to afford it—a third of mankind—are the most profoundly threatened by an inflationary world economy. They face the despair of abandoned hopes for development and the threat of starvation. Their needs require our most urgent attention.

The United States is committed to continue its program and pledges its ongoing support for an early replenishment of the International Development Association. In addition we are prepared to consider with others what additional measures are required

to mitigate the effect of recent commodity price rises on low-income countries least able to bear this.

• **Fifth, in a global economy of physical scarcity, science and technology are becoming our most precious resource. No human activity is less national in character than the field of science.**

To help meet the developing nations' two most fundamental problems—unemployment and hunger—there is an urgent need for farming technologies that are both productive and labor-intensive. The United States is prepared to contribute to international programs to develop and apply this technology.

—At current rates of growth, the world's need for energy will more than triple by the end of this century. To meet this challenge, the United States Government is allocating \$12 billion for energy research and development over the next five years, and American private industry will spend over \$200 billion to increase energy supplies. We are prepared to apply the results of our massive effort to the massive needs of other nations.

—The poorest nations, already beset by man-made disasters, have been threatened by a natural one: the possibility of climatic changes in the monsoon belt and perhaps throughout the world. The implications for global food and population policies are ominous. The United States proposes that the International Council of Scientific Unions and the World Meteorological Organization urgently investigate this problem and offer guidelines for immediate international action.

• **Sixth, the global economy requires a trade, monetary, and investment system that sustains industrial civilization and stimulates its growth.**

To this end the United States proposes that all nations here pledge themselves to avoid trade and payments restrictions in an effort to adjust to higher commodity prices.

The United States is prepared to keep open its capital markets, so that capital can be recycled to developing countries hardest hit by the current crisis.



The United States has called on all nations to avoid trade and payments restrictions in order to adjust to higher commodity

prices and to promote a trade, monetary, and investment system that will sustain and aid the growth of industrial civilization.

IN PRINT

Broadcasting Fertilizer Information

A Review by John Malcolm

Fertilizer Guide for the Tropics and Subtropics by Jan G. deGeus. Centre D'Etude De L'Azote, Zurich, Switzerland, 1973 (second edition). 757 pp.

The value of this fertilizer guide is attested to by the decision of the author and publisher to revise and update the information it contains. The problem for a reviewer is to divine the basis of the popularity. As a guide it contains more than we wish to know about almost all of the major crops of the tropics without coming to a simple balanced statement of the fertilizer and associated cultural practices to be applied in well defined situations. Although work from over 100 countries is cited, there is very little attempt at synthesis or value judgments which might guide an extension agent, farmer, or planner. On the other hand, it contains a wealth of information which can be interpreted by a trained agronomist. In spite of the frustration it causes, it is a book which I want for my own professional library.

The most valuable characteristic of the book is its detailed information. An impressive list of references has been assembled and abstracted for each of the approximately 100 crops discussed.

The first chapter is a general discussion of soils and fertilizer and the succeeding 10 chapters deal with major categories of crops, such as cereals, sugar, root, and fiber crops. Careful attention is given to describing the fertilizers tested for each crop and the various factors which interact affecting the rates of use, balance of nutrients, timing, and methods of application.

Yields are reported from various experiments and for farm production in a number of countries and

regions. Massive demonstrations and straightforward recommendations of an agricultural extension service are reported in the same pedantic style as the results of carefully replicated factorial experiments conducted with the ultimate in controls. Key persons working with particular crops are identified as potential sources of new information within individual countries or regions.

The illustrations are good photographs of well-managed commercial farms. The photographs give fine examples of good husbandry under widely different conditions throughout the tropics and subtropics. There is no attempt, however, to document deficiencies or to show the types of response which can be expected from fertilizers on the various crops.

There are many aspects of the book which are distracting or defeat the apparent purpose in preparing it. The distractions are no more than that. The page format omitting indentation of paragraphs or alternate spacing between paragraphs makes a crowded page; one from which it is difficult to select between key points and supporting evidence.

More seriously, the lack of consistency in organization of the crop-by-crop discussions is a major hindrance. Some chapters start with a discussion of suitable soil areas, others with climate or with fertilizer recommendations. Although specific fertilizer recommendations or generalized suggestions are given, more often results at specific sites or recommendations of one country are presented without comment on their general applicability.

Not all of the variation, however, can be charged to the author. In many cases there are gaps in the information in the original reports.

With minor crops, there is very little information on which to base a recommendation. With the major crops there is too much. More selective reporting coupled with analysis would have greatly improved the book.

Finally, this is not a book which was intended to be read through, even hurriedly, as it must be for a review. It is a source of specific information on specific crops. Normally, the reader would be looking at only one crop at a time and most frequently one aspect of the culture of that crop. Used in this way, it will be a valuable resource to AID advisors and other agricultural specialists.

BOOKS RECEIVED

The following books, dealing with topics related to development, have been received by *War on Hunger*. Listing of these books does not preclude their review in future issues of the magazine.

One Hundred Countries, Two Billion People—the Dimensions of Development by Robert S. McNamara. Praeger Publishers, New York, 1973. 124 pp. plus appendix, \$5.95.

Agricultural Mechanization in Developing Countries, edited by Merle L. Esmay and Carl W. Hall. Shin-Norinsha Co., Ltd., Tokyo, Japan, 1973. 221 pp., \$9.

Tales of Two City-States: The Development Progress of Hong Kong and Singapore by Theodore Geiger. National Planning Association, Washington, D. C., 1973. 227 pp. \$3.50.

Agricultural Modernization Through Production Contracting: The Role of the Fruit and Vegetable Processor in Mexico and Central America by J. David Morrissy. Praeger Publishers, New York, 1974. 114 pp. plus appendixes and bibliography, \$15.

Mr. Malcolm is an Agriculture Specialist in the Bureau for Technical Assistance, AID.

IN BRIEF

Food for Drought Victims

Sorghum and salted dried fish will be provided to the drought-stricken victims of Niger, Mali, and Gambia as part payment for work under the World Food Program of the United Nations.

In Gambia, sorghum and salted dried fish worth \$456,000 will be supplied to farmers and their families who work at well digging, irrigation and road construction projects, and on communal farms. In Niger and Mali, sorghum shipments, valued at \$2 million and \$423,000 respectively, will be used as rations to encourage farmers to cultivate their fields and not abandon their lands to seek food in towns.

To date, the World Food Program has provided food aid totaling \$10.3 million in 1974 for these three West African countries and Senegal, Upper Volta, and Chad.

India's Wheat Crop Down

India's current wheat harvest may fall about 30 percent below the target of 30 million tons set by the Indian Government. Reports cited by the U.S. Department of Agriculture attribute the shortfall to drought, inadequate fertilizer supplies, a lack of fuel for irrigation pumps, and an outbreak of rust disease.

Currently, India is in worse condition this year than it was in the 1972-73 season even though production is up 6 percent. India's wheat reserves have been largely depleted, and because of a continually rising population, India requires an additional 2.5 million tons of grain to feed its people annually. The drought conditions that have hindered the usually reliable winter rains will have an effect on India's need for imported grain this year. Latest estimates show that 4.5 million tons of grain will have to be imported if India is to maintain its per capita supplies at the current levels.

Afghanistan and Kenya Use ERTS

Afghanistan and Kenya recently signed agreements with the Agency for International Development enabling them to receive photo images from the Earth Resources Technology Satellite (ERTS), which has been circling the earth since June 1972.

The remote sensing census project agreements provide satellite photo coverage to these countries enabling them to estimate population size and distribution as well as to identify and study various earth features such as vegetation, water, geological characteristics, and land use patterns.

The data received from the remote sensing project will also be used in demographic studies to improve maps for population surveys and censuses to record changes in rural and urban development. In addition, ERTS images can be used to assist in exploration for ground water and in developing new plans for irrigation projects and road routes.

A major benefit of the project is the relatively low cost involved. The only other method for obtaining similar information is aerial photography, which is extremely expensive.

AID's contribution to the Afghan project totals \$165,000 over a three year period and \$200,000 to Kenya over a three year period.

The remote sensing projects were developed by AID and the Bureau of the Census.

QUOTES

"Americans are no less generous than, for instance, the people of my own country, Sweden. Yet our aid is increasing and yours is decreasing. . . .

"I firmly believe, not as a moralist only but also as an economist, that the only really effective way of getting our peoples to support aid . . . and to pay taxes to support aid, is to appeal to their sense of human solidarity and compassion."

*Gunnar Myrdal
Washington Star-News
January 13, 1974*

"The International Development Association takes the tough cases; countries doing well don't need IDA loans. But countries that do need IDA loans need them desperately; the loans represent the narrow ledge of international concern to which the recipients cling. Even if we could bring ourselves to abandon the people of those states to whatever miseries fate might bring them, we would still have a hard

core of direct self-interest in offering them a hand. We want them to be tolerably stable because we all inhabit the same world. And we want access to their resources and markets and, in another framework, their understanding and respect. It is idle to believe that shutting off development loans will make such countries better world citizens or more pliant to our will."

*The Washington Post
March 26, 1974*

" . . . the spectacle of the Arabs rapidly becoming rich is making Western nations feel poor, at least too poor to be patient about donating foreign aid. Whether the Arabs will step manfully into this gap, even to the extent of offsetting the extra burden on oil-importing poor countries, is one of the most pressing questions posed by their suddenly changed condition."

*Richard F. Jannsen
The Wall Street Journal
March 11, 1974*

DEPARTMENT OF STATE
Agency for International Development
Office of Public Affairs
Washington, D. C. 20523

AN EQUAL OPPORTUNITY EMPLOYER



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The unfertilized beans (left) and those from a treated plant (right) illustrate the significant difference fertilizer can make in crop yield and quality. But greatly increased prices and short supplies of fertilizer presently threaten to curtail food production in developing countries during the next three years. (See page 5)