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THE GREEN REVOLUTION: ACCOMPLISHMENTS AND APPREHENSIONS

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BEFORE THE

SOCIETY FOR INTERNATIONAL DEVELOPMENT

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1. Green revolution. 2. Agricultural development. I. Gaud, William S. II. Title.

Five months ago today I addressed another meeting of professionals in the field of development. The International Development Conference, which was then meeting here in Washington, asked me to discuss "What We Have Learned in Fifteen Years of Development Assistance." I said that one of the lessons we have learned is the paramount importance of the world food problem. And, I added, the developing nations are beginning to apply this lesson. They are making their agriculture "more intensive, more productive."

Over the last five months we have seen new evidence of their progress. Record yields, harvests of unprecedented size and crops now in the ground demonstrate that throughout much of the developing world - and particularly in Asia - we are on the verge of an agricultural revolution.

- In May 1967 Pakistan planted 600,000 acres to new high-yielding wheat seed. This spring, the farmers of Pakistan will harvest the new wheats from an estimated 3.5 million acres. They will bring in a total wheat crop of 7 1/2 to 8 million tons - a new record. Pakistan has an excellent chance of achieving self-sufficiency in food grains in another year.

- In 1967 the new high-yielding wheats were harvested from 700,000 acres in India. This year they will be planted to 6 million acres. Another 10 million acres will be planted to high-yield varieties of rice, sorghum and mullet. India will harvest more than 95 million tons in food grains this year - again a record crop. She hopes to achieve self-sufficiency in food grains in another three or four years. She has the capability to do so.
- Turkey has demonstrated that she can raise yields by two and three times with the new wheats. Last year's Turkish wheat crop set a new record. In 1968 Turkey will plant the new seed to one-third of its coastal wheat growing area. Total production this year may be nearly one-third higher than in 1965.
- The Philippines have harvested a record rice crop with only 14% of their rice fields planted to new high-yielding seeds. This year more land will be planted to the new varieties. The Philippines are clearly about to achieve self-sufficiency in rice.

These and other developments in the field of agriculture contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets, nor is it a White Revolution like that of the Shah of Iran. I call it the Green Revolution.

This new revolution can be as significant and as beneficial to mankind as the industrial revolution of a century and a half ago. To accelerate it, to spread it, and to make it permanent, we need to understand how it started and what forces are driving it forward.

Good luck - good monsoons - helped bring in the recent record harvests. But hard work, good management, sound agricultural policies in the developing countries and foreign aid were also very much involved.

The New Seeds

Today's developments have been more than a few seasons in the making. Twenty-five years ago, the Rockefeller Foundation began its highly successful work to strengthen wheat production in Mexico. The Foundation concentrated next on rice, the most important crop in the world. More people eat rice than any other food. Over 90% of the billion and a half people of Asia live mostly on rice, and about 80% of them spend most of their time growing it.

In 1962 the Rockefeller and Ford Foundations established the International Rice Research Institute at Los Banos in the Philippines. Their object was to develop new varieties which would increase rice production in countries such as India, Thailand, Pakistan, the Philippines, Cambodia and Laos - countries where rice was important but yields were low.

The Institute canvassed the world for samples of rice seed, looking for varieties to cross in order to form the hardiest, most adaptable, most nutritious strain. 10,000 varieties were collected. Peta, a tall Philippine variety which originated in Indonesia, was crossed with a short variety from Taiwan, Dee-geo-woo-gen. The result was named IR-8. By 1966 it was fully developed.

IR-8 has a stiff, strong, short straw. It does not fall over, or lodge, when the plant is heavily fertilized or when it is buffeted by wind and rain. It matures quickly, allowing for two - sometimes three - crops in a single year. Some call it the "miracle rice." Under favorable conditions, each planting yields four to six times as much as most traditional varieties.

High-yield varieties of wheat, maize, sorghum and millet have also been developed in recent years. The best known - and most importa of these are the "Mexican wheats" developed by the Rockefeller Foundatio which have quadrupled Mexican yields from 11 to 40 bushels per acre.

It is a long way, however, from break-throughs in laboratories and test fields to the record crops now being harvested by tens of thousands of farmers in half a dozen or more countries. Transforming the new seeds into food for millions of mouths requires many things. Some of these the developing countries can supply, some they cannot.

To begin with, of course, there must be a will for improvement in the developing countries themselves. In many of them such a will exists - particularly in Asia, where the pressures of food and population are so intense. Given this will, the people of the developing nations can put the new seeds, the fertilizer and the pesticides to work. And their governments can provide the credit, the price incentives and the market that will begin to change their lives.

But the developing nations - their governments, their institutions and their farmers - cannot sustain the Green Revolution without outside support. They lack the skills to do the necessary adaptive research. They lack the foreign exchange to import fertilizer. They lack the capital to build fertilizer plants. They lack the facilities and the technicians needed to train their people in the new ways.

If this agricultural revolution is to succeed, it can only do so as the result of a working partnership between the advanced and the developing nations.

Fertilizer

Take fertilizer. To produce their high yields, the new seeds require far more fertilizer than traditional varieties can absorb. Fertilizer - inducing a demand for it, supplying it, teaching farmers to use it and putting it to work - is one key to the Green Revolution.

In 1960 Pakistan used little fertilizer - 30,000 tons - and practically none on food crops. In 1969 Pakistan will need 420,000 tons, most of it for food crops. Only foreign assistance can satisfy this need. A.I.D., which over the past three years has made over $70 million in Development Loans available for fertilizer exports to Pakistan, proposes to lend Pakistan $60 million for this purpose in 1969 alone.

In 1963 much of India's meager supply of domestically manufactured fertilizer was backed up in warehouses - unused. Today, India is using the equivalent of one-fifth of its foreign exchange earnings to import fertilizer and raw materials to produce the stuff. A.I.D. will finance $200 million worth of fertilizer on a loan basis for India in 1969.

By 1980 the world demand for fertilizer will probably increase two and one-half times or more. This is why fertilizer is rapidly becoming the largest single element in the A. I. D. program. This is why A. I. D. is backing a growing number of American companies in their efforts to put up fertilizer plants in countries which are seeking to expand their production of food. And this is why the program which A. I. D. has proposed to Congress for FY 1969 emphasizes Development Loans and Alliance Loans to finance exports of American fertilizer: $200 million to India, $60 million to Pakistan, and lesser amounts to Brazil, Chile, Morocco, Tunisia, Indonesia and Laos among others.

New Attitudes

You are familiar with the physical requirements of the new agriculture - seeds, fertilizer, pesticides, farm-to-market roads, irrigation, and so forth. You know, too, that the success of the new agriculture will depend as much on attitudes as on tangible inputs and infrastructure.

To the farmer, the new seeds and fertilizer represent an untried and expensive investment. The high yields

of IR-8 depend on a combination of intensive labor and materials which makes it four times as costly to grow as ordinary rice. Only when the farmer sees that the added investment will increase his profit will he give them a try.

In the Philippines, a "do-it-yourself" rice kit designed by the A. I. D. Mission has helped persuade him. It contains IR-8, fertilizer, pesticides and instructions. It gives farmers a chance to try out the new agriculture on a small scale. A. I. D. financed the first 100 kits. Over 22,000 have been sold since.

In our own Middle West in the 1930s, Mr. Roswell Garst of Iowa sold hybrid corn to American farmers by demonstrating its high yield when the seed is properly fertilized. Thirty years later in El Salvador, Mr. Garst and Dr. Benjamin Birdsall of A. I. D. re-applied this technical assistance lesson by starting a mass fertilizer demonstration program to induce the farmers of El Salvador to grow more corn.

Each dollar invested in seed, fertilizer and insecticide gave the farmer a return of $3.50 to $7.50.

The demonstrations spread. In 1966-67 total corn production in El Salvador increased nearly 22% over the previous year - double that year's average gain in Latin America. Total cost of the demonstrations over three years: only $50,000. More than half this amount was contributed by private industry, the balance by A. I. D. and the El Salvador Ministry of Agriculture.

The higher investments required by the new agriculture also make farm credit essential. In the Philippines, many of the IR-8 rice kits have been distributed on credit extended by private rural banks receiving A. I. D. support. Similarly, Turkish farmers now get high-yield seed on credit. And to get seed on credit, they must also take the necessary amount of fertilizer on credit.

Farmers are responding to these new opportunities. In Pakistan where they have never before paid a premium for seeds, they are now doing so. They want the high-yield varieties. There have been reports of seed riots in India. At times the demand for fertilizer in India has been strong enough to create a black market.

New Policies

New government policies are also essential to the new agriculture. Since the early 1960s we have pressed the developing nations to invest more in agriculture, to introduce price incentives and other measures which favor and stimulate food production, to shift fertilizer manufacture and distribution from public channels to more efficient private outlets, and to liberalize import quotas on raw materials for fertilizer production.

Increasingly, we have made such policy reforms conditions for receiving both food aid and A.I.D. program loans. The message has been getting through. More resources are going to agriculture - in India, for example, where a change in priorities was plainly in order. In 1966-67 India increased its budget allocation to agriculture by more than one-third.

In Pakistan until recently, fertilizer was distributed through government outlets even at the retail level. A.I.D. urged that private dealers be allowed to take over. One of our fertilizer loans was conditioned on wider private distribution. By last summer there were over 10,000 private fertilizer dealers in East Pakistan - an increase of nearly 50% in one year - and more private dealers are entering the field.

Prospects

New inputs and infrastructure, new attitudes, adequate farm credit and sound policies - these are the active ingredients of the Green Revolution. And they are paying off. World agricultural production

in 1967 set a new record, and the less developed countries accounted for most of the increase. Total agricultural output in the developing nations rose by 7 to 8 per cent over 1966. Per capita food production increased by 6 per cent.

This year, an estimated 16 million Asian acres are being planted to the improved varieties. Next year, the total could be 30 to 35 million acres or more.

The world is on the brink of an unprecedented opportunity. The critical food problem of the next 20 years can be solved. A growing number of developing nations are now moving to solve it.

The question is whether this promising state of affairs will continue - whether the growth of food production in the developing world will continue to accelerate - whether this burgeoning agricultural revolution will become a part of the permanent order of things.

Too many people think this question can be answered only by the developing nations. They are wrong. The answer depends as much upon us as it does upon them.

Their governments and their people are increasingly committed to development. But how about us? How sure is our support? How firm is our resolve? How strong is our will? Is our commitment as strong as that which we demand of the countries to which we are giving aid?

Can anyone in this room give convincing affirmative answers to these questions? I doubt it.

Foreign aid is not without friends in this country. However, too many of the supporters of the program tend to be "one-stop" shoppers. They admire and advocate the one part of the program which happens to touch them most - research, family planning, technical assistance, incentives for private enterprise, whatever it may be. Too few of the friends of foreign aid seem to realize that there is no single panacea for development. Too few of them understand that progress in agriculture - or in any other high-priority field - cannot be isolated from overall economic development.

We welcome the good intentions of all the friends of foreign aid. We ask for their fighting support for the entire program over the next months - as I now ask for yours.

We need it. The foreign assistance program for this fiscal year passed the House by just eight votes. The President's economic aid request was cut by nearly 30 per cent. Last week and this, at hearings on the program for the coming year, members of the House Foreign Affairs Committee - supporters and critics alike - warned me that last year's rough sledding would only get rougher.

The developing countries, thanks to their efforts and ours, are on the verge of unprecedented success - while our foreign aid is on the verge of unprecedented trouble.

Why? Not, I think, because of the admitted limitations and imperfections of the program. Nor do I believe that our deepest trouble stems from the scandals, some of them going back several years, which have given foreign aid as much publicity over the past couple of months as the program normally receives in the course of a year. I am not minimizing these matters, but they must be weighed against the merits of the program as a whole.

Is the aid program in trouble because economic development does not matter - because it is not important? Nonsense! Development is the burning obsession of more than half the people in the world. Development, as Pope Paul has said, is the new name for peace. Development does matter and it cannot wait.

Is it because foreign aid will not work? Hardly! There is far too much evidence to the contrary. The story of the Green Revolution is not a story of failure, it is a story of success.

Is it because we cannot afford the foreign aid program? Absurd! We are the richest and the most affluent nation on earth. Our Gross National Product has been increasing by tens of billions of dollars each year. We can afford what we want to afford.

The real answer why foreign aid is in trouble lies in the single word "frustration." We have discovered that the plush world of the 1960s is not the easiest of all possible worlds. It is far more complicated and bewildering than the relatively simple two-camp world of the 1940s and early '50s. The rough spots of today's world are very rough indeed. We are repeatedly called upon to solve problems to which there are no easy or total solutions.

Vietnam is the epitome of these problems, and Vietnam has a great deal to do with the troubles of foreign aid.

The feelings of many about Vietnam typify their growing frustration with the world role of the United States: uncertainty about our course, discouragement with our progress and doubt whether the duties of service and leadership justify the costs.

Disagreement with United States policy in Vietnam also serves as a pretext for opposing foreign aid. This strange mixture of apples and oranges - is no basis on which to make national policy. This is no way to judge foreign aid or to determine the nature and size of our program.

Disagreement over Vietnam is no excuse for withholding support from the new Asian Development Bank. Disagreement over Vietnam is no excuse for undercutting the efforts which the Indians and the Pakistanis

are making to feed their people. Disagreement over Vietnam is no excuse for abandoning the peoples of Africa in their struggle for progress. Disagreement over Vietnam is no excuse for short-changing the Alliance for Progress and telling the people of Central and South America they must wait for help which they need and can use now.

Yet this is the kind of talk which we hear increasingly on Capitol Hill, in parts of the press and elsewhere.

These lame excuses for cutting foreign aid reject reality: the reality that for the rest of this century the aspirations which have inspired the Green Revolution will continue to be the dominant interest of more than half the free world. There is no better hallmark of today's world than the determination of the emerging nations to develop, and to feed and care for their people.

Our foreign assistance programs must be judged on their merits. We cannot allow them to be brushed aside because we do not like what is going on in Vietnam, in Paris, or even in Watts - frustrating as these vital problems may be.

Our size and wealth endow us with the obligation to lead and to serve. We cannot stay on the sidelines.

It is time to stop making excuses - time to look squarely at the foreign aid program - time to pull ourselves together and do what is both responsible and right.