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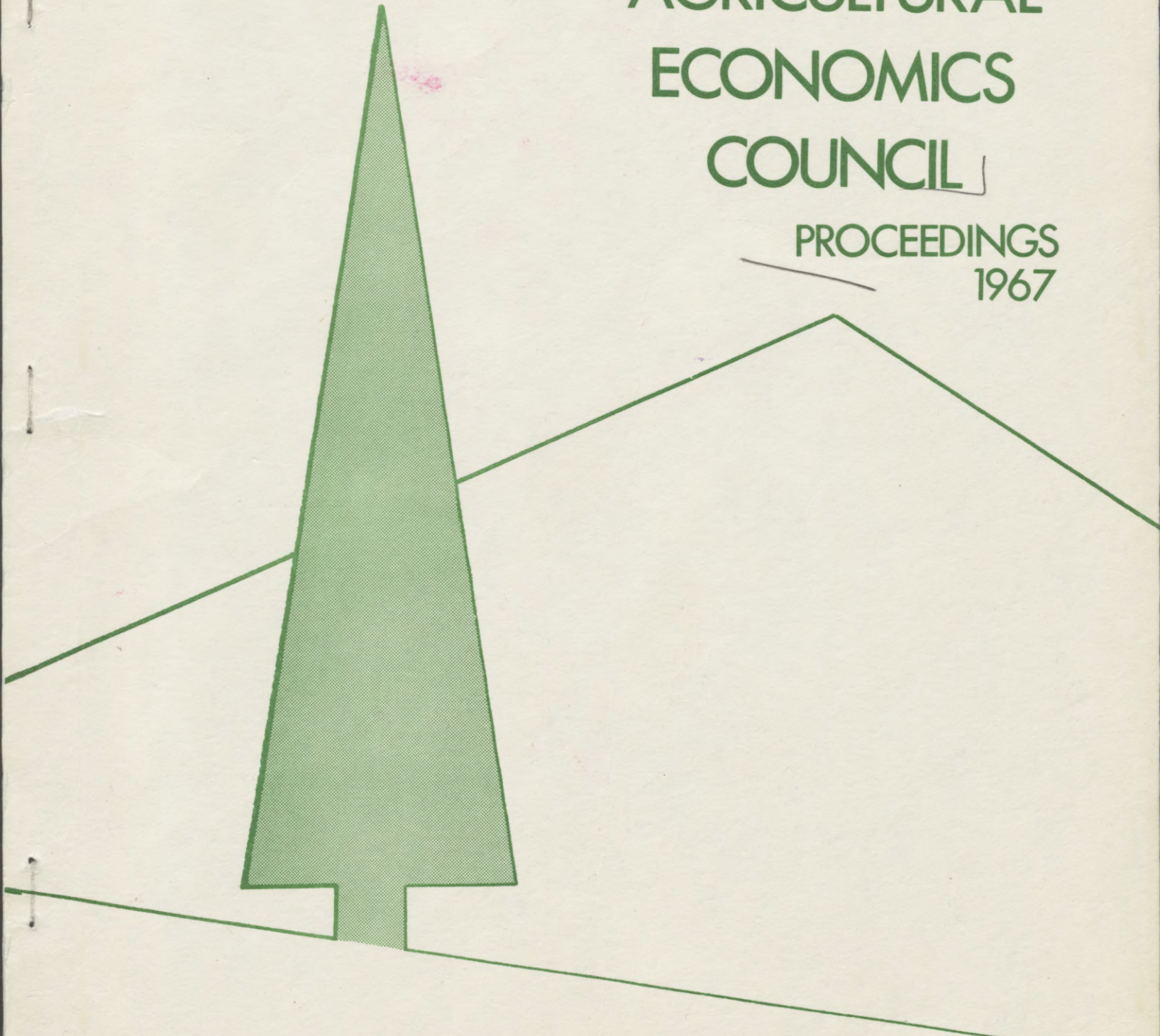
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THE 40-YEAR WAR OF THE 20TH CENTURY

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Introduction

As agricultural economists, you are surely aware of the great international concern for raising food production in the developing countries. This concern and the programs associated with it have been popularized as the War on Hunger... a war which we might better call: The 40-Year War of the 20th Century.

In this century, we have come to think of wars as conflicts of short duration. The First World War lasted a comparatively short 4 years, the Second only 6 years. The Korean conflict was over in 3 years and one month, and the recent outbreak in the Middle East raged for a record of only 6 days.

Historically wars have not always been so brief. The Christian Holy Wars dragged on for 174 years. Two families fought for the throne of France for 100 years. And in the 17th century, a bloody, Thirty-Years War waged between Catholics and Protestants.

Modern socio-economic wars may be more like these earlier conflicts in their time horizon. The War on Hunger might be called a modern Forty-Year War. As we enter it we must not underestimate the extent of the involvement; we must not promulgate institutions and programs which do not measure up to the long-term tasks at hand.

The War will be long and difficult, as the President's Science Advisory Committee points out in their recent study on the World Food Problem "... hunger and malnutrition are not primary 'diseases' of the last half of the 20th century. Rather, along with the so-called population explosion, they are symptoms of a deeper malady -- lagging economic development of the countries of Latin America, Asia, and Africa, in which nearly two-thirds of the people of the earth now live."

Population growth rates have accelerated because death rates declined. Production has failed to keep pace with increased demand. Diets are inadequate. Technologies of temperate zone agriculture are generally not directly applicable to tropical climates. The dissemination of information is hampered by illiteracy.

Victory against such odds will require agricultural growth rates never before realized even in the United States. It demands changes in the basic values, traditions, and techniques of millions of people. Never before has change by so many in such short time been required. The resources we have thus far committed to the battle are relatively small. This is, indeed a 40-Year War of the 20th Century.

The Problems

Population and Nutrition

Perhaps the clearest index to the size of the task is the population explosion and the inadequate diets in many areas of the world today. It was not until 1800 that world population reached 1.0 billion. By 1900, however, there had been

a 50% increase, and that level was doubled by 1960 to 3.0 billion. It is expected that the figure will double again by the year 2000. Most discouraging is the fact that the people are coming where the food is not. All but 15% of this latter increase will be in the hungry countries -- those least able to feed themselves. Communist China, India and Pakistan will account for one billion of a 2.5 billion increase in the developing countries.

While food production has increased in the developing world, it has barely kept up with population surges. During the 1950's, slight gains were made in per capita food production in the developing world. But food output per person has stagnated thus far during the 1960's. Today, one-half of the world's children do not receive adequate protein. The post-weaning disease kwashiorkor, for example, is caused by insufficient protein in the presence of adequate calories. It is a disease prevalent in nearly all the low-income countries of the world.

While protein deficiencies are not directly fatal, they lower the body's resistance to other diseases. Common childhood diseases can be fatal. In areas of protein malnutrition, infant mortality of 1-4 year olds is 50-60 times that of areas of adequate protein. Tanganyika, Pakistan, India, Brazil, the UAR, Chile, all have over 100 infant mortalities per one thousand births. Deficiencies in protein also impair the physical and mental development of children thus seriously limiting their potential contribution to society.

Literacy

In many of these countries we are dealing with literacy levels well below the 80% level existing in the United States - as long ago as 1870. Colombia, for example, ranks among the most literate with a rate of 60%. There are many nations which have no immediate prospects for attaining even this level. Brazil stands at 49%, Turkey 39%, India 24%, Pakistan 19%. This general illiteracy impairs the exchange of information. Programs and institutions designed to assist in agricultural development must take this situation into account.

Shifts in Trade

In the large shifts in the flow of world grain trade we see the failure of food production in the developing countries to meet increased food needs. In the 1930's, of all the major world regions, Western Europe alone was a net importer of grains. Latin America was the leading exporter. Even Asia was a net supplier, exporting over 2 million tons a year. Today, the grain production picture has changed dramatically. Latin America is barely self-sufficient. Eastern Europe and Asia import substantial quantities. Africa, too, is a consistent importer. North American exports which amounted to 5 million tons (primarily Canadian) in the period 1934-1938 have increased to 60 million, about three-fourths of which is coming from the United States.

The increased dependence on the United States for soybeans has been equally dramatic. Before World War II, China supplied about 90% of world soybean exports. Today, trade is more than 3 times the pre-war level. The United States supplies 90% in addition to exporting large quantities of soybean oil and meal.

A comparison of overall trade between the developed and the developing world is also startling. The lower income countries exported 11 million tons of grain per year to the developed world in the late 1930's. Since the war, the flow has been in the opposite direction and increasing. Four million tons in 1948-52; 15 in 1957-60; 21 in 1961; and 31 in 1966.

The above gives some idea of the dimensions of the war.

Change is Not Always Rapid

Many of us are impatient to win crucial battles in the struggle to improve agriculture in the poor countries. However, our own experience in the United States and abroad should remind us that agricultural development is a slow process requiring perseverance and endurance.

U. S. Experience

Our own Department of Agriculture required long years for growth and development. On July 1, 1862, Isaac Newton became the first Commissioner of Agriculture. He had nine employees. It wasn't until 27 years later in 1889 that the Department attained Cabinet rank and a budget of 1.1 million dollars. At that time, 1.1 million dollars was less than one percent of the Federal budget, even though agricultural people composed two-thirds of the U. S. population.

Then too, to establish an institution does not guarantee that the impact of technology will be immediate. Take the case of hybrid corn. Today, almost all of U. S. corn acreage is planted with hybrid seed. It hasn't always been this way. Open pollinated varieties developed from blending northern flint and southern dent corn dominated U. S. corn culture from 1870-1940. Though experimentation on corn inheritance started as early as 1906, it wasn't until 1918 that D. F. Jones at the Connecticut Agricultural Experimentation Station suggested the use of double-cross hybrid involving four inbred parents.

Despite the substantial research, education, and extension work of the Department of Agriculture, of the land-grant system and the numerous efforts of the sophisticated agriculture-related industries, less than two-thirds of corn acreage of the United States was seeded with hybrid corn in 1945. This percentage did not reach 94 until 1958.

In considering the pace of land reform in the developing countries we are prone to forget that the Homestead Act of 1862 was passed after decades of controversy, unrest, and debate.

As early as 1797, petitions asking for a land donation program were made to Congress. In 1825 Senator Thomas Hart Benton suggested that Congress investigate possibilities of giving land to settlers. Twenty-one years later the first Free Homestead Bill was defeated. The debate on land reform developed into a sectional struggle in the 1850's, and it wasn't until southern delegates withdrew from Congress that it was possible to enact the Homestead Bill of 1862. We are also apt to forget that the Homestead Act was not without its imperfections. For example, until 1890 only 1 in 3 homesteaders stayed on their farms long enough to obtain deeds. Monopolists still received large grants of land. By 1900, 600,000 farmers held patents for 80 million acres, while railroads had been given 183 million.

Experiences Abroad

Observing successful efforts in foreign countries to increase yields, one is again impressed by the time requirement.

Taiwan, for example, has experienced an impressive agricultural growth rate and is today a major source of agricultural technical assistance. But, post-war improvements have been based on substantial progress made under Japanese occupation beginning just before the twentieth century. The political control developed in the first 15 years - 1895 to 1910 - was an important prerequisite to the initiation of many programs in later years. Early agricultural development from 1910-20 in Taiwan emphasized adaptive research, variety improvement, vocational education, irrigation and flood control projects, multiple cropping and the development of the infrastructure important to agricultural production. New varieties of rice and sugar cane were introduced in this early period. Irrigation projects were emphasized in the 1920's and 1930's.

Developments of improved varieties of wheat, potatoes, and beans in Mexico by the Rockefeller Foundation, and of IR-8 rice by both Ford and Rockefeller Foundations at the International Rice Research Institute, Los Banos, Philippines, have been most encouraging. Yet even these successes have required substantial periods of time.

In Mexico, for example, the Rockefeller program was initiated in 1943 at the invitation of the Mexican Government. It wasn't until the mid 1950's, however, that Mexico became self-sufficient in wheat, and the 1960's that she became self-sufficient in corn. The task in Mexico was not simply one of developing higher yielding varieties. It also required bringing about their general adoption. The adoption of improved varieties of wheat has been much more successful than that of corn. For example, over 90% of wheat acreage is seeded with improved seed, but only 10 to 20 percent of corn production is from improved varieties.

One factor accounting for this contrast is that wheat is most often grown on larger farms for which better seed distribution, credit and marketing are available. Corn producers are generally small farmers. Other factors have had both a direct and indirect effect on the significant progress of Mexican agriculture.

The revolution of 1910-1916, for instance, permitted stabilization of the political environment. Land reform, particularly that occurring from 1935 to 1941, expanded the land area devoted to agriculture.

Thus, the experiences in the United States and in foreign countries suggest that many changes essential to agricultural development require considerable periods of time.

The evolution of political control, establishment of institutions, building of infrastructures, discovery of new technology, adaption of older technology, and adoption of new techniques all take time.

Importance of Customs and Tradition

Why does it take so long to win these battles for agricultural change? In most cases, we seek a revolution in yields and in food production which involves adjustments in customs and traditions passed down for generations. Such advances are not gained easily, but they must be made.

We must help those among the emerging people who dare to challenge tradition, to defy custom and to lead others in the search for change. Recognizing problems is not enough. Solutions must be uncovered, technology applied, outmoded political and social structures must be modified. And, most important, changes must be made by the people themselves. We cannot do it for them.

Training and education in agriculture are vitally important to those who will lead the way. Training can stimulate them to dare to be different, help them determine how to be different, and give them confidence that their innovations will be successes. The widespread changing of customs, attitudes, and traditions is an overwhelming task. It is when we see agricultural development in the context of such socio-political change that the time needed for development is most impressive.

Adaptation May Save Time

I do not mean to suggest that the time requirement cannot be modified. It can be. Accumulated agricultural technology can ease the resolution of the world food crisis.

We have, in fact, encouraged the adaptation of temperate zone agricultural technology in order to save time for the low-income countries. For example, varieties have been transferred and institutional development in some cases has been patterned after successful U. S. institutions. In this approach it is important to distinguish between direct imitation and adaptation. The President's Science Advisory Committee states emphatically that "The products of technology and know-how cannot be transferred directly to the developing nations ... a blueprint for a bicycle or a steel mill can be shipped overseas and utilized without alteration, but the blueprints and architecture for a food crop must be developed overseas."

We must not succumb to the illusion that agricultural development is merely the transplanting of U. S. Government and educational organizations abroad. Institutions must be tailored to the needs and resources of the country involved.

Institutions in the developed countries designed to enhance adaptation of new ideas may need to be substantially different from those required in a country heavily dependent on the development of original findings. Thus, while it may be prudent to adapt technology, this very approach may dictate that institutions differ.

For example, I wonder how wise it is for the ministries of agriculture to be patterned after the USDA? Many have been. Should the colleges of agriculture be patterned after the U. S. land grant system? Perhaps not; but many attempts are being made to make them similar.

Adaptation in contrast to imitation and origination has a further important positive effect in the low-income countries. Pride in oneself and in the accomplishments of one's country is a powerful work incentive.

We know very little about the art of relating the desire for self-achievement to the problems of food production. Yet this desire generates energy that we could and should capitalize upon. One of our most immediate tasks is to create in the leaders of developing countries an interest in helping themselves in agriculture.

The War on Hunger can be waged and won faster if the developing countries mobilize the same interest and enthusiasm for feeding their people as many of them are able to do for military conflicts.

Some Implications

The long time required for agricultural development has important implications for international programs of universities of the United States as well as the agencies of the Federal Government.

Need for Stable Financing

The area of financing is a clear example. The United States needs to break away from the uncertainty of year to year financing of assistance programs. Such an approach seriously limits the type of program which can be undertaken within the developing countries, and adds an element of instability to U. S. institutions supporting these development efforts. Short-term projects can alleviate pressures and buy time, but long-run involvement in agricultural programs is necessary. Under the current approach to financing, long-range projects risk being cut off before completion, and so must be sacrificed to immediate pay-offs.

Somehow political exigencies must be met without losing the long-run programs. The attention span of the general public both at home and abroad is short. They demand material proof of progress and remain relatively unmoved by promises. We must devise fundamental, long-range programs which evoke continuing public support.

Need for Added Resources

Massive investments of resources and technology combined with broad political control have substantially reduced the length of military conflicts. But, unfortunately, the world persists in spending large amounts on military adventures and spends little on economic assistance.

We are still devoting only a small part of our resources to agricultural development. In 1965-66, for example, all of the OECD countries spent slightly more than \$10 billion in aid to low income countries. In contrast, the respective military budgets of just four of the OECD members were:

United States \$48.5 billion; United Kingdom \$6.0 billion; Germany \$4.6 billion; France \$3.9 billion.

Given the long-run nature of development problems, shouldn't state institutions such as your universities assume a greater role in financing international work with its important benefits to society in general?

Better Use of Manpower

Perhaps some of the more important implications of the time dimension involve personnel development in the universities and the Federal agencies.

Both the training of foreigners and technical assistance have long been recognized as major tools of development. Yet only a small proportion of U. S. professional agriculturalists is presently engaged in this development work.

As our involvement continues, the demand for U. S. professional agriculturalists will undoubtedly expand. It is essential that your institutions meet this demand. For example, are prospective students made aware of the potential need for agriculturalists in international work? What adjustments in your curricula are required to equip these people for agricultural work in the developing world? How can members of your staffs take part in agricultural development?

Need for Flexibility in U. S. Thinking Too

I fear that we are often as firmly attached to our customs and traditions as the farmers in developing countries are to theirs. If we are to win this 40-Year War of the 20th Century, changes in ideas, customs, and traditions must occur in the United States as well as in the developing countries. And changes must occur in the organizations we represent - the universities and the Department of Agriculture. But are we as flexible in changing our ideas, our customs, and our traditions as we expect the developing countries to be?

How long, for example, is it taking the United States to become fully aware of the world food problem -- to mobilize resources to discharge our responsibilities? What progress have we made attuning our efforts in education to the burgeoning domestic and foreign demand for agriculturalists?

What progress have we made convincing our government leaders and representatives to give support to the world's struggle against hunger? How much are we willing to sacrifice to bring about a better world -- not only for the developing countries but for ourselves as well?

I mentioned earlier that the men that really count in the War on Hunger are the ones that dare to be different. This is as true in the United States as in the developing countries. Some of you here must buck the establishments, question the present way of doing things, propose and advocate new approaches. Some of you here must personally involve yourselves in this battle lest our forty years become a hundred.