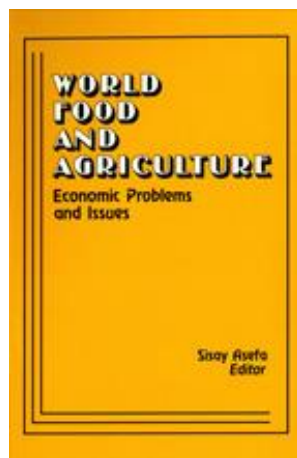


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Introduction

Sisay Asefa
Western Michigan University



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Introduction

Sisay Asefa
Western Michigan University

The Department of Economics of Western Michigan University was fortunate to attract six eminent agricultural economists to its 1986-87 lecture-seminar series to address various dimensions of the problem of world food and agriculture. This book contains six essays based on the public lectures delivered by the guest scholars during the 1986-87 academic year.

This introductory chapter will address and synthesize some of the main issues and problems of world food and agriculture and leave the reader to pursue the detailed discussion and analysis of the issues by the individual authors. The essays are presented in the order of the scholar's appearance in the lecture-seminar series.

Some of the main issues and problems addressed in the essays are: (1) the role of technical change in agricultural development; (2) the value of learning from historical and comparative experience in tackling rural and agricultural development problems; (3) the role of foreign assistance in agricultural and rural development; and (4) the current problem of hunger in Africa.

The Role of Technical Change in Agricultural Development

The issue of technical change in agricultural development is most extensively explored in Vernon Ruttan's essay. In his model of "induced technical change," Ruttan stresses the idea that technical change is indigenous, that is, made possible by farmers' responses to differences in availability and relative prices of resources.

He argues that differences in the economic environment and resource endowment are critical in influencing the direction of technical change. He supports his argument by presenting empirical evidence based on historical data on the experience of Japan and the United States in agricultural development. He points out that Japan adopted a biological and chemical agricultural technology that is land-substituting and labor-augmenting primarily as a response to the relative scarcity of arable land it faced during its historic agricultural development. On the other hand, the United States adopted a mechanical agricultural technology that is labor-substituting and land-using because it had relatively abundant arable land and scarce labour during its historic period of agricultural development. Ruttan shows, using comparative data of the two countries, that the difference in long-term trends in relative factor prices “induced” the different paths of technological change adopted by each country.

Bruce Johnston extends the issue of technical change beyond the critical role of relative factor prices and resource endowments by pointing out that the promotion of technical change in agriculture is not automatic and self-generating. He argues that the promotion of technical change requires active participation by both private and public institutions. The private aspect of technical change is determined by what he calls “farm-level factors” that require investments in land improvement, equipment, fertilizer, improved crop and livestock varieties, working capital, and skills of farmers. Individual farmers are in the best position to undertake the decision about the proper acquisition and utilization of these factors, while government can play a supportive role. On the other hand, inappropriate government policies, such as unfavourable price policy to farmers, can impede the development of these farm-level factors.

Successful adoption of farm-level technologies also requires what Johnston calls “socially determined facts” such as agricultural research, an extension system, and infrastructure, as well as appropriate macroeconomic policy environment. The latter factors, which are complementary to the farm-level factors, are beyond the control of individual farmers. They can best be provided by government.

The resource endowment situation of most developing countries is characterized by abundant rural labor that calls for effective utilization

in the agricultural sector which in turn requires the adoption of labour-intensive chemical and biological technology as the most appropriate form of technical change. Chemical and biological technology that is yield-increasing is characterized by complementarity between inputs such as fertilizer and water. This implies that in a tropical and semi-arid environment, successful adoption of such technology requires adequate water availability that can only be provided by irrigation in the absence of reliable rainfall and the presence of recurrent drought.

Moreover, environmentally-specific chemical and biological technologies are not on the shelf for some tropical regions of the world such as Sub-Saharan Africa. It is therefore important to take up the challenge as stated by Ruttan: “Over the next few decades to develop agricultural research capacity in each agro-climate region of the world in order to take advantage of development in biological/chemical technology.”

The critical obstacle to generation and adoption of agricultural technology in the future may not be the lack of scientific and technical change, but may arise from domestic economic policy and political barriers to technical progress in the agriculture of many developing countries.

The Value of Learning from Historical and Comparative Experience in Tackling Rural and Agricultural Development Problems

Lessons from historical experience of other countries are quite valuable in tackling problems of rural and agricultural development, provided they are correctly understood and applied. The significance of past experience in understanding the poverty problem in general is stated by T.W. Schultz in his inaugural lecture for winning the Nobel prize in development economics as follows: “Understanding the experience of poor people over the ages can contribute much to understanding the problems and possibilities of low-income countries today. That kind of understanding is far more important than the most detailed and exact knowledge about the surface of the earth, or of ecology, or of tomorrow’s technology.”¹

The historical experience of Japan and the United States in choosing the technological path appropriate to their relative resource endowment has already been pointed out. Further, as argued in Johnston's essay, the Japanese experience is perhaps the most relevant for today's developing countries, since it involved increasing small farm productivity by adopting labor-intensive biological/chemical technology in the form of fertilizer and improved crop varieties as well as the concurrent development of agriculture and industry which allowed positive interaction between the two sectors and gradual absorption of labour by industry and other sectors of the economy. If agricultural productivity had not risen to provide adequate food supplies, the terms of trade would have turned against the industrial sector retarding the growth of the Japanese economy. However, this was prevented by Japan's successful adoption of biological and chemical technology which increased food production as well as provided necessary employment during the historic transformation of the economy.

Comparative lessons from a more recent experience of other developing countries, such as India and China, also have some useful implications for regions of the currently deficient agriculture and food production, such as Sub-Saharan Africa. The Indian case is presented by Uma Lele who reminds us that, after the earlier policies that undervalued agriculture and contributed to the food crisis of the 1960s, India later carried out an economic reform which included the development of a strong agricultural research system and an effective fertilizer distribution network, raised farm commodity prices, and provided incentives to farmers to use fertilizer and new crop varieties. Lele points out further that the food situation of India before and during the reform 20 years ago was similar to the current food and agricultural situation in Ethiopia and Sub-Saharan Africa.

While the institutional context is different, China's simultaneous emphasis on rural and agricultural development and rural industrialization featured by small labor-intensive rural industries also provides a valuable lesson. Furthermore, China's experience with the organization of agriculture demonstrates a valuable lesson about the limitation of collectivized agriculture as a viable economic unit of agricultural development. After a long experience with collective farming, China

found that even small collective farms posed serious incentive and managerial problems and introduced, since 1981, reforms that have essentially returned Chinese agriculture to a system of individual household farming units.

Valuable lessons from comparative experience can be drawn not only from similarities but from dissimilarities, as stated by Lele. She points out that, while Africa and India are of about the same geographical size, Africa is much more diverse, constituting some 50 different nations, about one thousand ethnic groups, and several thousand languages. India, on the other hand, is one country with less diversity than Africa. More significantly, Lele states that India's food production problem was simplified by the fact that it was primarily a problem of increasing the production of wheat and rice, for which technology was being developed by the international research centres in cooperation with Indian agricultural scientists. The current food production problem in Africa, on the other hand, is more complex than the Indian case, since it means the development and adoption of technologies for a more complex and diverse food grain system, such as sorghum, millet, maize, cassava, root crops, for most of which environmentally-specific and locally tested technologies have not been developed.

The Role of Foreign Assistance in Agricultural and Rural Development

Foreign assistance can play an important role in agricultural and rural development provided that it is properly focused and utilized in alleviating rural poverty. Considerable experience with foreign assistance has been gained over the past few decades to help distinguish between which types of assistance have been successful and unsuccessful. Foreign assistance has the greatest potential to succeed when it is focused on agricultural and rural development. As John Mellor notes, this is because of the employment- and income-generating implication of agriculture that make increased food production and increased employment "two sides of the same coin." Increased food production can initiate multi-

ple forces of growth, employment and income generation in the whole economy of a typical developing country characterized by the majority of its population still on the rural sector, as implied in Mellor's essay.

Peter Timmer and John Mellor are in general agreement on the notion that improving agricultural and food production in developing countries has a positive sum outcome of reducing poverty in the Third World and increasing U.S. farm exports. Timmer's analysis, which emphasizes a macroeconomic framework, is, however, cautiously optimistic about the implication of increased food production in the Third World for U.S. agricultural exports. He shows, through a complex web of general equilibrium relationships, the structural adjustment to global competitive pressures required by U.S. agriculture in the future.

Another feature of successful foreign assistance is that it is long term and sustained, as noted by Eicher and Lele. Currently, there are good reasons to be concerned with the state of foreign assistance in Africa, which appears to be short term, unstable, and uncoordinated. Numerous donors guided with diverse objectives and criteria are engaged in the "business of foreign assistance" in Africa. The value of some of this assistance in reducing poverty and hunger is quite questionable. Eicher raises a challenging question to donors when he asks: "Why did the U.S. government take the long view in India in the 1960s when it helped develop 23 new state agricultural universities and funded their development for 15 years? Why is the United States taking the short-run view in Africa in the 1980s?"

As a form of development assistance, food aid, which is currently popular, is quite inadequate. It can only be justified as a tool of famine relief, as stated by Johnston. Food assistance can even be harmful because it may divert the attention of governments from the critical problem of long-run agricultural development and poverty alleviation required for ending hunger. Moreover, it cannot be sustained in the long run and has the potential of being used as a political tool by donors and recipients.

The Current Problem of Hunger in Africa

The contemporary problem of hunger in Africa is most directly addressed in Carl Eicher's essay, where he outlines six challenges that must be faced by scientists, policymakers and politicians in order to end hunger in Africa. I find three of these challenges especially crucial. One challenge posed by Eicher to African politicians and governments is to look back and learn from their own experience of recent history and correct the mistaken economic policies that undervalued agriculture and food production, and to face up to the fundamental fact that agricultural development is an evolutionary and complex process that does not lend itself to rhetoric, ideology, or crash food production campaigns. Current and future generations of African policymakers must learn from the painful experience of some African nations that wasted a generation on revolutionary rhetoric and ideological entanglement in global power politics, and on hasty, ill-planned rural and agricultural experimentation that has contributed to increasing mass poverty and hunger.

Another challenge is the need to make a critical investment in human capital development and carry out necessary educational reforms away from the colonial elitist model that sets wrong curriculum priorities and undermines technical and agricultural education. For instance, the University of Botswana, 22 years after independence, does not have a faculty of engineering or technology, and its faculty of agriculture is just being launched during the current academic year.

The final challenge posed by Eicher is the need for policymakers, both donors and recipients, to focus in what he calls "the prime movers" of agricultural development, such as new technology generation and adoption, human capital and managerial skill development, biological and physical capital development, institutional development and implementation, as well as development of an economic policy environment favorable to agriculture and food production. It is important, as pointed out by Eicher, for donors and African governments to make long-term and sustained investments simultaneously on all of these "prime movers" due to their complementary and lengthy gestation

period. Emphasis on one factor, such as the one currently prescribed by the International Monetary Fund (IMF) and the World Bank for making domestic price policy reform in exchange for additional loans and grants can be ineffective. In other words, policy initiatives such as domestic currency devaluation, abolishing price controls, eliminating government grain boards and fertilizer subsidies, when carried out in isolation without any clear guidelines and assistance to manage the political and economic consequences, will be unlikely to succeed, as Eicher's essay implies.

In sum, African governments and policymakers must take the primary responsibility and effort in restructuring their domestic policy environment. Donors can assist in complementing this effort by making a necessary long term and sustained investment in agricultural and rural development.

NOTE

1. See the Nobel Lecture by T.W. Schultz "The Economics of Being Poor," *Journal of Political Economy*, 1980, 88, 4, p. 641.