

BOOK REVIEWS

Seeds of Plenty, Seeds of Want: Social and Economic Implications of the Green Revolution by Andrew Pearse, New York, Oxford University Press, 1980, xi + 262 pp.

It was in the latter half of the 1960s that the Green Revolution became a highlight on the stage of the world food problem. The stars on the stage were high-yielding varieties, or HYVs, of rice and wheat, one of which was admired as "Miracle Rice."¹ Their performance was so attractive in many cases doubling the yield of rice and wheat that the audience, including specialists and policymakers who were concerned with the food problem in the world, tended to be optimistic concerning the solution of this problem. For instance, Lester R. Brown, was rather pessimistic in 1964 and noted that: "The less-developed world is losing the capacity to feed itself. Stated otherwise, the less-developed world is no longer able to provide enough food for large numbers of people being added each year,"² but in 1968 his opinion changed to one of optimism when he stated: "The world has recently entered a new agricultural era . . . the old era ended in 1966 and the new began in 1967. . . . The agricultural revolution in Asia should not be viewed as an event but as the beginning of a process—the eventual modernization of Asia."³ At a seminar organized by the Asian Development Bank in 1969 to discuss the findings of its first Asian Agricultural Survey, one of the papers was titled "The Promise of Abundance."⁴ This was another example which aptly reflected the optimistic mood at that time.

In 1973 and 1974, however, grain prices increased tremendously and there emerged a shortfall in food supplies in several developing countries in the world. Again pessimism came to dominate the thinking of many specialists and policymakers. Brown became a pessimist again and mentioned in 1973: "Given the precariousness of the world food balance at present it might be wise to reduce consumption of meat a few pounds per capita within affluent, overnourished societies such as the United States in order to accumulate some food reserves now to lessen the chaos which will result a year hence if the drought cycle should return to North America next year."⁵

¹ This was the name given to a HYV of rice, IR-8, which was developed at the International Rice Research Institute in the Philippines.

² Lester R. Brown, "World Population Growth, Food Needs, and Production Problems," paper presented at the annual convention of the American Society of Agronomy in Kansas City, November 17, 1964, p. 5.

³ Lester R. Brown, "A New Era in World Agriculture" (USDA 3773-68), paper presented at the symposium on World Population and Food Supply, Kansas State University, Manhattan, Kansas, December 3, 1968, p. 1.

⁴ See W. David Hopper, "The Promise of Abundance," in *Regional Seminar on Agriculture: Papers and Proceedings*, ed. Asian Development Bank (Manila, 1969), pp. 30-36.

⁵ U.S. Congress, Committee on Agriculture and Forestry, *Hearings on U.S. and World Food Situation*, 93rd Cong., 1st sess., October 1973, p. 103.

It is now clear that Brown swung too far in both directions. He was too pessimistic in 1964 and 1973 and too optimistic in 1968. Not only he but also many others swung in a similar manner during the last two decades. The development of HYVs proved that it was possible to achieve significant yield increases, but the Green Revolution did not solve all the food problems of the developing countries.⁶ Besides, the Green Revolution could not reduce rural poverty which is widespread in many developing countries. Although in the process of the Green Revolution the introduction of new technology has increased production to a certain extent, it has become clear that the overwhelming majority of rural people have not been given their proper share of the benefits.⁷ It is necessary to examine carefully and in depth the economic and social implications of the Green Revolution which was meant to overcome the food problems and rural poverty in developing countries. *Seeds of Plenty, Seeds of Want* written by Andrew Pearse is just such a study. The origins of this book go back to 1970, to the decision to undertake a wide examination of the Green Revolution. The series of studies known as Global Two was a joint undertaking by the U.N. Research Institute for Social Development (UNRISD) and the U.N. Development Programme. The multi-disciplinary team that conducted the studies consisted of agronomists, sociologists, agricultural economists, anthropologists, political scientists, and historians, and was led by Andrew Pearse, the author of this book.

The book consists of three parts. Part 1, which includes two chapters, deals with some essentials of the conceptual framework, and the characteristics of the technological aspects of the Green Revolution as a genetic-chemical technology and its propagation. In Chapter 1 "The New Technology and the Peasants," the basic theme of the book is outlined. The suppositions for Global Two hence for the book are based on the belief that technology and social relations are intimately linked and that a change in technology is virtually always associated with a major change in social relations. The new technology of the Green Revolution is built around the use of man-made varieties of wheat, rice, maize, and other foodgrains in man-controlled environments. Therefore, "the crux of the technical problem lies in obtaining a balance between all the elements in the production process that is an optimum match for local conditions. It is on account of the complexity of this problem that sponsors of the technology developed the idea of a 'technological package'" (pp. 11-12). However, the package existed, in reality, as a norm or model for the program officials, while "*its realization depended on the cultivator and the kind of service relation he could establish with these [several different public and private] sources*" (p. 12). The author considers that: "the most realistic assumption on which to base an explanation of the motives and decisions of cultivators is that they all pursue livelihood and that their decisions about technological practices must submit to the exigencies of the tactics of this pursuit" (p. 17), and that: "the concept of 'livelihood' is therefore at the centre of the motivational scheme" (p. 17). Thus "the key to the motivation of the cultivator is taken to be his struggle to defend and improve family livelihood

⁶ D. Gale Johnson, *World Food Problems and Prospects* (Washington, D.C.: American Enterprise Institute for Public Research, 1975), p. 14.

⁷ See Asian Development Bank, *Rural Asia: Challenge and Opportunity* (New York: Praeger, 1978), pp. 49-64.

according to appropriate local models" (p. 20), and it is within this framework that the author enquires into the main influences which effect the cultivator's decisions. Peasants know a lot about the food problem—most of them spend their lives searching for a solution to it—but it is not the same as the food problem of governments which have "a political concern for the livelihood of the rural poor, either as a result of fear of instability and unrest or out of a reliance on peasants and labourers for political support" (p. 21). In countries where the livelihood of the majority of rural people is supplied directly by their link with productive activities involving self-provisioning, the new technology initiates or accelerates structural changes. "In order to take advantage of science's contribution to agriculture, the cultivator must operate in the market to obtain and pay for the new elements of production" (p. 23). Furthermore, the author makes an assertion that improvement of the productive capacity of the cultivators can improve their livelihood and vice versa. In such conceptual framework summarized above, the following chapters discuss the social and economic implications of the Green Revolution.

In order to be successful, programs of technological improvement or transformation must have political motors. In Chapter 2 "Political Motors of Technological Innovation," the importance of the political will to introduce innovation in food production is demonstrated in several cases: The first three cases are the colonial regimes of Taiwan, Northern Rhodesia, and Surinam where colonial powers have attempted to introduce the new technology in their own tropical possessions for their respective purposes; and then in the Mexican case where the HYVs of wheat were developed and spread, hinging on the twin motors of profitability and political support for the entrepreneur group by the government.

Part 2 which consists of six chapters is based on an assumption that variations in agrarian structure directly affect the mode of technology-induced economic and social transformation. The agrarian structure is classified into three types in this book: type 1 is a structure found mainly in Africa and in some less populated areas in Asia in which traditional forms of communal tenure are still widespread. Chapter 3 "Communal Tenure Structures and an African Experiment" introduces African cases, particularly the Sierra Leone Swamp-Rice Scheme; type 2 is a "bi-modal" agrarian structure in which the larger property directly farmed by subjected labor or wage labor is set amongst settlements of peasant agriculture and in which an unequal but symbiotic relation exists between them. This form has predominated in Latin America and North Africa. In Chapter 4 "The Dynamics of Bi-modal Structures," the exploitative nature of bi-modal agrarian structures is revealed, and the effects of the new technology in Mexico, Tunisia and the Philippines on these structures is explored; and type 3 is the Asian peasant structure which is now deeply penetrated by extortionate tenancies. In Chapter 5 "Promotion of the New Technology," reports are presented on the introduction of HYVs in India, Indonesia, Sri Lanka, and Malaysia to overcome stagnation and low productivity in peasant agriculture, where special attention is given to the way the different programs have been organized and administered. Three other related questions take a chapter each: Chapter 6 "The Economics of Farm Size" shows that the economies of scale enjoyed by big users of the new technology are not so great but that the big user nonetheless draws greater economic

advantages from it than the small cultivator does; Chapter 7 "Changes in Asian Tenancy" demonstrates the importance of tenancy—both as the system that affects the lives of most Asian peasants and also as one of the means by which they are exploited—by introducing the cases of India, Sri Lanka, Indonesia, and Malaysia; and Chapter 8 "Effects of Mechanization" examines the different impacts of mechanized irrigation, the tractor, and the combine harvester, especially the effect on jobs and livelihood.

Part 3 contains five chapters which discuss the various effects of the introduction of the new technology on the rural economy and society as well as the development strategies implicated by the Green Revolution. Chapter 9 "The Critical Issues" summarizes major issues that have arisen with the large-scale introduction of the genetic-chemical technology and accompanying mechanization and capitalization of agriculture. After a discussion under the following sub-headings: incorporation and external dependence; emergence of the entrepreneurial cultivator; the talents-effect and the terms of incorporation;⁸ inseparability of the farm and the household economy; inequality and the distributive services; and critique of the Green Revolution strategy, the author summarizes in short: "In unequal societies the new technology can facilitate 'take-off' for cultivators with land and some capital but institutes changes that marginalize the small cultivators without capital and land and undermine the essential and customary means of livelihood of an ever-increasing number of people in rural areas" (p. 157). In Chapter 10 "Coping with the Talents-Effect," various approaches to the problems posed by the talents-effect are examined from the experiences of India, Mexico, Malaysia, and China, and the essentially different character of the problem and the capacity to handle it are noted. In Chapter 11 "Choosing the Right Policy," the author argues that "where inequalities exist already, the green revolutionists' strategy results in the persistence and generation of poverty for the majority of the people in rural areas" (p. 207). In Chapter 12 "Appropriate Technology," he stresses rural livelihood as a leading criterion to decide whether or not a particular technology is appropriate; and then identifies land-and-water improvement as the most vital single element in increasing food supplies. Finally in the last Chapter 13 "Peasant-Based Strategies," the author discusses the various peasant-based strategies in differing social systems by which productivity is increased without gross polarization of wealth, citing the examples of Japan, Taiwan and China.

One of the very important issues which have become common in the governments of developing countries as well as in international institutions in the last decade is "growth versus equity."⁹ The Green Revolution we have experienced is certainly concerned with this important issue. The author, as reflected in the title of the book,

⁸ The U.N. studies which the author depends upon reveal tendencies of a worsening direction in the basic food security of the rural poor as new technology and facilities are injected into agricultural societies already dominated by excessive inequalities and debt. He has named these tendencies the "talents-effect" after the well-known Biblical parable that a servant with ten talents can prosper through the favor of his master, while his humbler fellow with a mere talent is obliged to be weaker and more miserable (p. 5).

⁹ The issue is also an important academic research theme. For instance, the main theme of the XVIII International Conference of Agricultural Economists to be held in Jakarta, August 1982, is "Growth and Equity in Agricultural Development."

explicitly directs attention to this aspect of the Green Revolution, which means the book has dealt with the key issue of the developing countries with regard to their contemporary agricultural development problems. The book provides us with the essence of various studies relating to the Green Revolution, including multi-disciplinary studies on it by the UNRISD known as Global Two, which cover Asia, Africa and Latin America. Thus the readers are able to grasp the sequence of the Green Revolution in its global perspective. Supported by such rich data, the author's arguments are persuasive. Some of his arguments are not new, but we can reconfirm them by this work. As a whole the readers are able to learn a great deal concerning the social and economic implications of the Green Revolution.

The following are some comments on the book. The social implications of the Green Revolution are generally well-analyzed, but the economic analyses are sometimes rather insufficient. For instance, the concept of "livelihood" is stressed as important but its economic analysis is not enough from the viewpoint of an economist. The comparability or consistency of the data upon which the book is based is not assured in principle because a major part of the data consists of multi-disciplinary studies which have been done on "the emergent situations at different levels and in different ways" (p. 2), according to their own methods of research and respective disciplines without any standardized instruments insisted upon. This has led to an analysis which is not systematically comparable nor clear-cut in some respects, though it may permit it to be more comprehensive.

The comments on more specific points shall be restricted to the last two chapters because of their importance and of the limitation of the review pages. Discussing appropriate technology, distinctions should be made between the short- or long-term viewpoint concerning respective local conditions. Land-and-water improvement is certainly the most vital element in increasing food supplies. As the author states, investment in minor irrigation and the improvement of existing irrigation systems should be imperatives if local conditions permit. But what can be done, for vast areas where there are still no irrigation facilities at all and where the acquisition of such requires huge costs?¹⁰ As a long-run perspective, international aid to investment in major irrigation facilities is necessary; but as a short-term perspective, we need alternatives as second best at least, which may include genetic improvements suitable to local conditions, even though their effects would not be so attractive as the HYVs of rice and wheat in appropriate conditions. It seems that the author is too pessimistic concerning the availability in the future of manufactured fertilizer at reasonable prices. The "energy crisis" certainly has affected fertilizer prices, but we can overcome this problem by expanding capacity, improving productivity, and through the fuller utilization of existing plants. The trend of fertilizer prices in the 1970s proves it.¹¹ We may utilize manufactured fertilizer in increasing food production much more than the author assumes. Furthermore, the author could have mentioned mechanization that can save labor in peak seasons and hence permit the planting of an additional crop. By the introduction of such mechanization cultivators can absorb their own

¹⁰ About 60 per cent of the rice area of the world is not irrigated according to the International Rice Research Institute, *World Rice Statistics, 1978*, p. 110.

¹¹ See D. Gale Johnson, pp. 68-72.

labor additionally in farming.¹² As the author notes, the establishment of appropriate national research systems is very important. However, he overlooks the serious manpower shortage in most of the developing countries. Without sufficient local manpower, any excellent research systems which might appear would not work effectively as the system-planners would expect. A very urgent matter in this regard is the training and education of agricultural scientists with the heavy support of the developed countries. As Theodore W. Schultz has stressed on many occasions, investment in human capital is essential in the development of agriculture.¹³ This is important both from the long- and short-term viewpoint.

Finally, regarding the last chapter on "peasant-based" strategies, two points are noted here: The author's discussions are based on the experiences of Japan, Taiwan and China. Though he distinguished the difference among the three, essentially he treated them as the same type under the term "peasant-based" technology. Japan and Taiwan can be grouped under the same category. However, China cannot be so because the collective farming system under the socialistic economy is fundamentally different from a market-oriented economy. Thus implications from it cannot be regarded as being the same, even though all three countries' agriculture is apparently peasant farming. As he mentioned, land reform was executed by the political force of the Supreme Commander of the Occupation in Japan and of the Kuomintang regime in Taiwan, respectively. And China's case was through political revolution. Thus all cases emerged "as a result of historic events larger than the agricultural sector and larger than the national framework" (p. 243). Are there any alternatives to abolishing the existing land-owning elite systems in other developing countries without such radical historical events?

The above comments do not mean that the value of the book is reduced. This book should be read by all researchers and policy-makers who are eager about agricultural and rural development in developing countries. (Saburō Yamada)

¹² See Asian Development Bank, *Rural Asia*, p. 249.

¹³ For instance, Theodore W. Schultz, "The Economics of Agricultural Productivity in Low Income Countries," paper presented at the Conference on Agricultural Development in China, Japan, and Korea, Taipei, December 17-20, 1980.

China's Transition to Industrialism: Producer Goods and Economic Development in the Twentieth Century by Thomas G. Rawski, Ann Arbor, University of Michigan Press, 1980, xii + 211 pp.

Mao Zedong, in his 1956 speech on the "Ten Major Relationships," criticized the Stalin method of putting priority on heavy industry, and advocated the increased rate of investment allocated to light industry and agriculture. The fact remains, however, that China's economic structure which clearly emphasizes heavy industry