

Per Pinstруп-Anderson, Alan Berg and Martin Forman (eds.). *International Agricultural Research and Human Nutrition*. Washington, D.C.: International Food Policy Research Institute, and Rome: UN Administrative Committee on Co-ordination/Sub-Committee on Nutrition. 1984. xvii+326 pp. Paperback edition.

During the last few decades there has been a sharp transition in economic doctrine, within the context of economic growth, on the relative contributions of agriculture and industrial development. There has been a shift away from the earlier 'industrial fundamentalism' to an emphasis on the significance of growth in agricultural productivity and production. The focus, especially in the context of the present-day less developed countries like Pakistan, has sharpened with the rapid growth in demand for food, resulting from the increasing growth in population and the high income-elasticities of the demand for food. Coupled with this is the transition from resource-based agriculture to science-based agriculture. Agricultural economists are unanimous in the view that by the end of this century all increases in world food production will come from higher yields, i.e. increased output per hectare. This increasing emphasis on 'land-saving' technology to increase productivity and production has resulted from the growing population pressures on land and declining land-man ratios. Agricultural research has come to the fore in providing technologies that increase productivity and production. However, these technologies do not explicitly take into account the equity aspects of the problem. The extent to which the poor gain or lose from the introduction of a new agricultural technology depends on a host of complex and interrelated socio-economic and political factors such as the existing distribution of productive resources, access to modern inputs, the structure of the market, etc. While it is true that massive increases in productivity are possible and have been attained, it is also true that a fair proportion of humanity is malnourished and starving. The need to build in explicit nutritional goals in the design of future agricultural research is thus paramount.

The book under review addresses this very important issue. It is a collection of papers arising from a workshop held at the International Livestock Centre for Africa under the aegis of the United Nations Administrative Committee on Co-ordination/Sub-Committee on Nutrition (ACC/SCN) working group on nutrition and agriculture. These papers present the results of studies on the activities of the various international agricultural research centres (IARCs) supported by the Consultative Group on International Agricultural Research (CGIAR) directed towards a better understanding of the way both international and national agricultural research can effectively assist in alleviating malnutrition. There are twenty-one chapters in all. In addition to the introduction, a summary of workshop discussions and recommendations and an excellent overview on incorporating nutritional goals into the design of international agricultural research, there are six articles or chapters on the basic concerns for incorporation of nutritional goals in agricultural research. Five of these chapters which cover areas from the establishment of commodity priorities, desired

changes in commodity characteristics, specification of desired technology characteristics and agricultural science planning are followed by discussion papers. The last of these deals with production research at the international agricultural centres and nutritional goals. In addition to these, there are 13 papers describing the nutritional dimensions of agricultural research at each of the 13 international agricultural research centres. These include, amongst others, the work being done at IRRI, CIMMYT and IFPRI to include the nutritional aspects into the design of agricultural research and the views of each of these institutions on the issue.

To the extent that changes in food supplies affect the food consumption of the malnourished people or the population at risk, such changes are the primary concern of the book under review. The extent to which increased food production leads to greater food consumption by the malnourished population varies from country to country and, within population groups, in the same country. It depends essentially on (a) the crop or livestock species, the production of which is being expanded, (b) the nature of the technology that brings about the expansion, and (c) the producers of the increase. Agricultural production research influences human nutrition through its various effects or linkages. These are classified in the book as the effects on (a) incomes acquired by the households at risk or the malnourished households, (b) the prices they must pay for food commodities, (c) the nature of the production systems among semi-subsistence farmers, (d) risk and uncertainty causing or resulting in fluctuations in food production, storage, prices and incomes, (e) the nutrient composition of foods available, (f) the composition of household income, intra-household income and budget control and the allocation of women's time, (g) the demand for labour, (h) expenditure of human energy, and (i) infectious diseases.

In the summary of workshop discussions and recommendations that appears as the second chapter of the book, four important and interlinked areas for decision-making are highlighted as priority areas in the attempts to integrate the nutritional dimensions into agricultural research. These are the setting of commodity priorities, the establishing of commodity characteristics, the choice of technology characteristics and the study and development of production systems. The nutritional effects of research into one commodity may be quite different from those of research into another. There is therefore a need to identify and prioritize for the allocation of research funds those commodities that form the staple diet of the malnourished or at-risk population. In this regard it is important to bear in mind that the nutrition problem should be considered in relation to diet rather than to particular commodities. Six commodity characteristics with important implications for nutrition were identified at the workshop. These are content and availability of nutrients, density of nutrients and energy, palatability and acceptability to consumers, preparation requirements, storage characteristics, and affordability. Four important characteristics of technology that affect human nutrition were identified. These are the nature of the technology in terms of determining the amount and cost of what is

produced, the extent to which malnourished or at-risk households gain from the technology, the reduction in the seasonal and irregular fluctuations in production that affect the prices received and incomes of the poor, and the extent to which the new technology affects household decision-making and determines household incomes and the allocation of labour time, particularly of women in the household. The definition of commodity priorities and technological characteristics also have a bearing on decisions concerning production systems. The extent to which agricultural research can contribute to the development and design of production systems that permit the malnourished or at-risk population to increase the intake of those dietary elements in which they are deficient is an important area for consideration.

While the book provides a clear definition of the priority areas to incorporate nutritional goals into agricultural research and detailed descriptions of the work of the various IARCs in this regard, it also notes that there has been very little work on establishing quantitative estimates of the nutritional effects of agricultural research. It notes that a greater knowledge of the way research has influenced human nutrition both globally and in selected countries or regions is imperative for providing guidelines for future research and policy making.

There are several important lessons to be learnt by developing countries from the work being done by international research organizations like the IARCs and the CGIAR. It is quite clear that the crucial area of agricultural research cannot be left to the forces of the market alone. This arises out of the non-excludability characteristics of fundamental agricultural research that makes it difficult for private-sector firms to exclude from the use of their research those who have not paid for it, and also from the stochastic nature of the agricultural research production function that requires large outlays of investment beyond the capacity of private firms over a large number of projects in order to minimize the risk. There is also the omnipresent problem of the misallocation of research resources to only those areas that can be protected by patents and trade secrets. It is important that developing countries should concentrate on establishing and strengthening indigenous public-sector research organizations that concentrate on key issues such as the incorporation of nutritional goals into fundamental agricultural research programmes. It is only then that collaboration with the international agricultural research centres will maximize the results of the research effort.

On the whole, the book is well produced. It documents a wealth of information of considerable use to researchers and students of agricultural development economics. The initial chapters contain some repetitions. However, these are to be expected in a book that is basically a report on the proceedings of a workshop.