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Food and Population: Priorities in Decision Making

Report of a Meeting
of the International
Conference of Agricultural
Economists, Nairobi, August 1976.

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The main problems identified and approaches to solutions

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The primary purpose of the seminar on Population and Food and Agricultural Development convened in December 1975 in Rome by the IAAE, in co-operation with FAO and UNFPA, was to examine key issues which arose at the present time in the relationship between food production and population. Profiting from the global assessments and the recommendations made by the World Population Conference in Bucharest in August 1974, and the World Food Conference in Rome in November 1974, the seminar sought to underline the basic issues and the priority areas of study with a view to assisting agricultural economists to make a fuller contribution towards the solution of the world population and food crisis. Beside the proposals of the two world conferences, the seminar had before it six country studies (Brazil, Yugoslavia, the Republic of Korea, Indonesia, India and Kenya) and twenty-seven papers by individual authors. These studies and papers have been since edited by the Chairman of the IAAE Committee on Population and Food, Dr Douglas Ensminger, in a volume entitled *Food Enough or Starvation for Millions*. An official report on the seminar has been already presented by the FAO Secretariat. In supplementing this report, the present paper draws attention selectively to the critical problems identified and approaches to solutions suggested in the course of discussions in the Rome seminar.

World conferences on population and food

While acknowledging the diversity of conditions within and among countries, the World Population Plan of Action, accepted at Bucharest, emphasised that population and development were interrelated, population variables influencing and being influenced by development variables and that population policies gained their greatest force and significance as constituent elements of comprehensive socio-economic policies. Therefore, the capacities of countries to deal effectively with their population problems had to be deepened and expanded. At the same time, in keeping with the growing interdependence among nations, there must be increasing international action towards the solution of development and population problems. Giving its main attention to the broader aspects of population policy, the World Population Conference was seized of the fact that the solution of the problem of population growth depended largely on a balance between the size of the world's population and the world's production of foodstuffs and volume of available resources. It realised too that grain stocks were now at lower levels than

in earlier years, so that the risks of malnutrition and possible starvation had increased. Therefore, all countries were urged to give higher priority to food production and fertiliser production, to devise ways of overcoming shortages and replenishing stocks, to expand food and agricultural output and to raise the volume of employment in rural areas. As part of a policy of intensive social and economic development, the World Population Conference stressed the role of rural development, including diversified agriculture, agrarian change, social welfare programmes and services for rural areas, rural industries, rural settlement schemes to relieve population pressure and the fullest participation of women in educational, economic, social and political life, on an equal basis with men.

The World Food Conference met under the shadow of the global food crisis which began with the widespread droughts of 1972 and was accentuated by the poor harvests of 1973 and 1974. The crisis has both short-term and long-term features, the latter being aggravated by the rate of population growth in the less developed countries compared to rising demand for food and modest rates of increase in food production. The relevant facts and analysis were presented by FAO in two earlier studies, namely, *Population, Food Supply and Agricultural Development* [1] and *Assessment of the World Food Situation – Present and Future* [2]. Being immediately concerned with practical steps which national governments and the international community could initiate for the management of the crisis which already loomed large, the World Food Conference addressed itself specially to the medium-term period of the next ten years or so, during which the rate of population growth was more or less predetermined. In particular, it urged improved planning of food aid, including provision of at least ten million tons of grain as food aid every year, an International Undertaking on World Food Security, involving a co-ordinated system of national food reserves and an improved Global Information and Early Warning System on Food and Agriculture. However, there were also many points of common emphasis between the two world conferences and these had particular interest for agricultural economists.

For the World Food Conference, the essential gravity of the food crisis lay in the fact that two-thirds of the world's population living in the developing countries produced about one-third of the world's food. Most of the world's hungry and ill-nourished lived in the developing countries and the present imbalance was likely to increase over the next decade. The means by which the Universal Declaration on the Eradication of Hunger and Malnutrition, drawn up by the World Food Conference, and the improvement of levels of living and the quality of life of the people, set as the principal goal by the World Population Conference, were to be realised over a period, formed the common theme of several of the resolutions of the two conferences. Thus they included in relation to the developing countries:

- achieving a desirable balance between population and food supply;
- highest priority to policies and programmes for increasing food production and improving food utilisation;
- striving, in accordance with each country's potentials, for the maximum

- possible degree of self-sufficiency in basic foods;
- expanding and improving the productivity base of agriculture;
- reducing rural unemployment by enhancing the capacity of the rural community to expand, intensify, and diversify its activities;
- pursuing the concept of integrated rural development as appropriate to the conditions of each country;
- bringing about progressive agrarian reforms appropriate to the circumstances of each country;
- implementing policies and programmes to improve nutrition;
- involving women fully in all aspects of a total development strategy, including food production, nutrition policies, medical and social services, provision for education and training and promotion of equal rights and responsibilities for men and women.

The papers presented to the Rome seminar covered a wide ground. Several issues were viewed from different standpoints in more than one paper. For the present review, we have found it convenient to look at different contributions as throwing light primarily on one or the other of the following themes of concern to agricultural economists. The various contributions, referred to by numbers in parenthesis represent chapters in Douglas Ensminger (ed.), *Food Enough or Starvation for Millions* (Tata McGraw-Hill, New Delhi, India, 1976), are listed at the end of this paper.

1. The global perspective;
2. Demographic elements in agricultural and rural development;
3. Removing the production constraints of the small farmer;
4. Strategies for rural development and the organisation of agriculture;
5. Research in demographic aspects of agricultural development;
6. International action.

The global perspective

The ‘emerging equation between population and food supply’, as bearing on two main groups of countries, the developed and the developing, was elaborated in three different ways: firstly, in relation to population and agricultural labour force projections; secondly, in relation to food production and demand for food; and thirdly, in terms of alternative futures for the less developed world.

The United Nations paper on the world population situation (7) provided for eight major geographic areas and twenty-four regions, analysis of trends for the period 1960–1975 and projections up to the year 2000. At the centre of the population perspective was the contrast in rates of population growth between the more and the less developed regions. In 1975, the latter formed 71.5 per cent of the total world population compared to 67.3 per cent in 1960. Over the period

1960–1975, the less developed regions grew in population at 2.3 per cent per annum, while the annual rate of population growth in the more developed regions fell from 1.2 per cent in the early sixties to 0.9 per cent in the early seventies. The social, economic and demographic consequences of such disparities in rates of population growth are well known. The United Nations paper examined the demographic aspects in some detail, especially fertility, mortality, life expectation, sex and age structure and growth of urban population. According to the ‘medium’ variant of the United Nations projections, the world population may grow from 3,967 million in 1975 to 6,253 million in 2000, about 90 per cent of the increase occurring in the less developed regions. The paper proceeded to describe the implications of these projections in terms of birth and death rates and gross reproduction between rural and urban population. For agricultural economists, aside from overall contrasts between probable trends in the more and the less developed regions and differences among the latter, a specially significant field of study is the marked decline in birth rates which is believed to have occurred in the Asian centrally planned economies, especially China and the social and economic policies to which this decline may be causally related.

In a paper which gave particular attention to questions of methodology, Naiken and Schulte (9) presented projections up to 1985 for total population, total labour force, agricultural labour force and agricultural population separately for developed market economies, developing market economies and centrally planned economies. As a proportion of the total labour force, the labour force in agriculture in the developing market economies is expected to form 53.3 per cent in 1985 compared to 61.5 per cent in 1975, the corresponding proportions for developed market economies being respectively 7.5 and 11.5 per cent. The authors drew attention to the need for projections of labour force demand to which projections of agricultural labour force could be compared. They also pointed to the essential distinction between ‘agricultural’ and ‘rural’ population or labour force.

The food supply and demand aspects of the population and food problem were discussed by Bhattacharjee in the background of the two FAO studies mentioned earlier as well as FAO’s Provisional Indicative World Plan for Agricultural Development (18). Although both developed and developing countries increased their food production at 3.1 per cent per year in the fifties and at about 2.8 per cent in the sixties, for the less developed countries the gains were largely offset by growth of population at 2.4 per cent in the fifties, around 2.6 per cent in the sixties, and 2.7 per cent in the early seventies. Bhattacharjee drew attention to differences in the situation of different regions and especially of Africa where population and food supply increased about equally until the early seventies when moreover, the effects of drought were much more severe than elsewhere.

The growing dependence of developing countries on food imports, as seen from the rise in the annual level of imports (excluding China) from 12.4 million tons during 1949–1951 to 45.5 million tons in 1973–1974, is regarded as posing the biggest problem for the future. As Perkins also pointed out (8), in developing

countries increases in population up to 1985 account for 70 per cent of the projected growth of demand. It is already apparent that, in 1985, the net cereals deficit may be of the order of 85 million tons. In keeping with trends in the growth of demand, food production in the developing countries should increase at an average of not less than 3.6 per cent per annum, varying from 3.4 per cent for Asia to 4 per cent for the Near East. FAO's studies indicate that the necessary potential for increasing cereal production is available in Asia and Latin America but Africa poses the major problem in the short and the medium-term. As Bhattacharjee pointed out, population growth in the developing countries has so aggravated the incidence of hunger and malnutrition as to raise sharply the issue of comprehensive development strategy and structural change, embracing the whole field of production, consumption, investment, employment and distribution within countries. This is now as important as the necessity of international action and bilateral co-operation in trade, aid and development. In the last analysis, population problems must be looked at, not only in relation to food supply but in the total context of patterns of agricultural and rural development in so far as they determine and are, in turn, determined by the human factors that population represents.

The problems highlighted in the perspectives sketched by Bhattacharjee and the United Nations projections were presented in a different form in the US Department of Agriculture study described by Rojko and O'Brien (19). Through an econometric study, they investigated the prospects of the less developed countries under three sets of conditions or scenarios. In the first of these, between 1970 and 2000, against an annual increase in population in the developed countries of 0.7 per cent per annum, the less developed countries grow at 2.6 per cent per annum. In the second scenario, the population of the less developed countries rises at 1.9 per cent per annum. In the third scenario, which is considered the most realistic, the population of these countries grows at 2.2 per cent per annum. Corresponding to the three scenarios, three alternative futures are projected. In Future I, the cereal import gap could increase to as much as 105 million tons, with but little improvement in *per capita* consumption of cereals. In Future II, net imports of cereals could be close to the level of the early 1970s, that is, about 28 million tons. In Future III, cereal imports are projected at 62 million tons. From this prognosis, Rojko and O'Brien went on to study the implications in terms of alternative farming systems. As they observed, the successful reorganisation of agriculture depends on injections of improved inputs and upgraded technology so that the developing countries can replace a relatively closed energy system, with low returns to man, with a more open system yielding appreciably higher returns. A high-return tropical agriculture can be organised but only on the basis of substantially higher energy inputs in the form of water control, fertilisers, pesticides, improved varieties, mechanisation and multiple cropping.

From the discussions in the Rome seminar on population growth and its consequences for food supply and agricultural development, two main sets of challenges emerged, those deriving directly from demographic factors and those

relating to the removal of existing constraints on the volume and pattern of agricultural production. These questions are considered in the following sections in the light of contributions by various participants.

Demographic elements in agricultural and rural development

The rural condition in most of the less developed countries is marked by a number of familiar features: high rates of fertility, high rates of infant mortality, widespread malnutrition and undernutrition, especially among the very young and women, large-scale underemployment and unemployment accompanied by migration from rural to urban areas and mounting urban unemployment, the impelling necessity to hold the increasing rural surplus within agriculture and failure to bring about a fundamental change in the quality of life of the lowest 40 per cent or more of the rural population. All these are aspects of a state of poverty which is directly, though by no means exclusively, related to the rate of growth of population and specially of the growth of the agricultural population and the agricultural labour force. The theme was considered from different angles at the Rome seminar in contributions from Wajihuddin Ahmed (10), Jean McNaughton (12), K.C. Abercrombie (11), Keith Compbell (25), H.R. Kötter (21) and R. Sinha and H.R. Kötter (13). Eva Mueller (31) turned the theme around and enquired into the possible channels or processes through which economic development and, in particular, rural development, might have direct and indirect repercussions on demographic events, especially on fertility. The questions raised inevitably revealed gaps in data and knowledge and suggested problems for further study. These have been brought together in a later section of this paper.

Any attempt to probe into demographic factors in agricultural and rural development brings us to the core of the problem of rural poverty. Ahmed (10) emphasised this to explain high birth rates among the rural poor. As he put it, a poor peasant's child is also his working capital and a source of profit. Children bred in poverty seem to cost too little. The poor beget more children than they want since they must reckon with the uncertainty of survival. Eva Mueller (31) also constructed an important part of her analysis around the notion of *perceived* costs and benefits of children for rural parents. Acknowledging the unsatisfactory data base, she suggested, nevertheless, that while the economic cost of children might exceed their economic value, non-economic satisfactions and security motives seemed to contribute significantly to pronatalist attitudes.

High rates of population growth in low-income countries and regions were considered a major factor in the prevailing malnutrition, underemployment, unemployment and rural-urban migration. However, they do not operate alone. They combine with other factors, notably inequitable distribution, an inadequate resource base in agriculture, lack of non-agricultural employment opportunities in rural areas and failure to bring about structural and institutional changes. In assessing each of the consequences, various contributors demonstrated their multiple

causation and, in turn, pointed to remedial measures which are also multiple in nature, calling for nothing short of a systems approach.

Jean McNaughton (12) reviewed population and nutrition interrelationships both at the micro level, as affecting households and individuals and at the macro level, the latter being but a summation derived, very approximately, from the former. She cited FAO data showing that energy supplies do not exceed 105 per cent of estimated requirements in any of the developing regions and in three of them are less than 100 per cent. Considering the unequal distribution of food supplies among different socio-economic groups, the conclusion is inescapable that a severe energy deficit must exist among several segments of the population. On a cautious reckoning, over 400 million individuals in the developing countries may have insufficient food intakes. The numbers may well be considerably larger.

Abercrombie (11), Kötter (32) and Sinha and Kötter (13) covered much common ground and were basically agreed on fundamentals. The essential point is that population and the agricultural resource base have to be brought into a state of dynamic balance. That is to say, on the one hand conditions have to be created for rapid agricultural development and increase in food production; on the other, there must be increasing (productive) absorption of the labour force in the agricultural sector until, at a future date, the non-agricultural sector can siphon off the surplus labour. Any imbalance between population growth and resource use often tends to perpetuate the deprivation of the poor and it is no accident that, under present conditions, substantial numbers would not be able to share equitably in the product of economic growth nor contribute significantly to socio-economic development. The principal element in the opportunity to participate and contribute is employment, whether on one's own account or for wages, a subject investigated in some depth by Abercrombie (11). Defining the agricultural labour force as comprising those born in the agricultural sector who cannot find jobs outside it, Abercrombie examined the factors at work both on the supply side and the demand side. The rate of growth of population determines the supply of agricultural labour. According to present projections, while the situation will vary from country to country, for the less developed world as a whole the turning point may only be reached by the second decade of the next century. In other words, the present agricultural employment problems of the developing countries are certain to last for a long time to come. The issue, therefore, resolves itself into action, firstly, to slow down the growth of the agricultural labour force by appropriate population policies and, secondly, to achieve a faster expansion of non-agricultural employment. On the demand side, the principal influences bearing on agricultural labour are the level and pattern of agricultural production, technology and the organisation of agriculture. As we shall see, Abercrombie (11), Kötter (32) and Sinha and Kötter (13) advanced similar propositions on the subject of organisation and their views on a selective approach to technological change, with due attention to the need to use the present human resource base as effectively as possible, are widely shared.

The agricultural labour force and the rural scene cannot be viewed in isolation

from the rates of urbanisation prevailing currently. Keith Campbell (25) examined the ways in which growth of cities affects the structure of, and income distribution in, the rural hinterland. As he put it, it is primarily through labour transfer that the process of urbanisation affects the agricultural sector. On the other hand, particularly in more developed countries or some of them, through this exodus, in many areas, rural homes are deprived of the most vigorous and the most vital groups of labour, intellectually more able, while land is left over to aging groups which in themselves are more conservative and not open to any technological and economic improvement. The phenomenon of rural-urban migration implies in fact the transfer of unemployment and poverty from the rural areas to the cities. While urbanisation undoubtedly influences the allocation of available investible resources, its most direct rural impact is upon the effective demand for food. Measures to slow down migration to the cities through rural development and labour-intensive industries are certainly relevant. However, on any longer term view, population control policies are seen as a vital ingredient in dealing with urbanisation and associated employment problems.

How demographic and development variables influence one another is a theme remaining to be probed in depth and there is need to go beyond assumptions derived from historical experience to analysis of causal elements and processes. Eva Mueller advanced some hypotheses in pursuance of such an analysis (31). In her conceptual scheme, as rural development occurs farm income, agricultural and other economic factors and community characteristics undergo large changes, so as to transform the farm household's economic environment. The consequential impact on fertility is largely indirect. The precise mechanisms involved are still a matter for surmise and Eva Mueller postulated several 'intervening variables', such as group norms, values and tastes, familial institutions, 'economic attitudes' (perceived costs and benefits of raising children) and changes in aspirations. The processes may differ in their operation between societies and between groups and individuals. It is important to mark, however, that any rural development strategy will have positive effects along with negative ones and there will be lags in the response of familial norms and values to economic change. In other words, the need for effective family planning programmes remains. Rural development programmes and family planning programmes should complement one another and much is to be gained from some degree of integration between them.

Two general observations may be added. The authors of this paper share the view that natural resources are limited and while a smaller or larger increase of the exploitation of many of them or their substitution is theoretically possible, this increase in practice requires a certain time lag with various economic implications (financing, trade, labour). It remains questionable whether and for how long this increase can practically proceed in step with the ever increasing rate of growth of population. The energy crisis and the emerging environmental difficulties provoke doubts about that. This topic is to be dealt with more closely later, so we just mention it here. Secondly, savings are also limited and one cannot use the same savings both for demographic and for economic investments. After

all, children are not born with new tools and new plots of land; additional new workers cannot currently produce more goods and income unless they are supplied with sufficient means of production or find new jobs available.

Removing the production constraints of the small farmer

The handicaps under which the small farmer labours and ways to reduce them formed the keynote of several contributions at the Rome seminar, notably those by D.W. Norman and M.S. Krishnaswamy (24), Douglas Ensminger (27) and Stanley Andrews (33). A paper by Robert W. Herdt and Randolph Barker examining the implications of proven farm production practices (23), prepared subsequent to the seminar, has also for its main interest the economics of the small farmer. This is also true of the contribution by B.A. Stout and Charles M. Downing (26) examining the concept of 'selective' or 'appropriate' mechanisation of agriculture. Three other questions, which bear in an overall sense on levels of agricultural production, namely, the influence of changes in weather conditions, statistics of food-energy balance and the role of price incentives, were considered in contributions by James D. McQuigg (17), Harold F. Breimyer (16) and R. Thamarajakshi (21). As these latter papers stand somewhat on their own, to be followed up apart from the main theme of the Rome seminar, it is convenient to refer first to the principal propositions presented in them.

It is not uncommon for national development plans and ministries of agriculture to advance projections of future levels of output of foodgrains and other agricultural commodities on the assumption of 'normal weather'. On the basis of extensive work done in the US, McQuigg (17) explained the pitfalls in all such propositions. He argued that statements concerning future yield trends can be more usefully made in terms of estimates of future variability of yields based on an adequate sample of climatic data. Moreover, in this form, in view of historical and real-time meteorological information that is now available on a global scale, policy and programmes vital to the world economy and population can be based on more realistic knowledge than was possible in the past.

The 'green revolution', involving the spread of modern technology and greater use of industrial inputs, has spread thus far only to a segment of the potential area. Even so, it has already raised the question of availability and cost of energy obtained from fossil fuels. Breimyer (16), therefore, insisted that statistics of food-energy balance should now be added to the two familiar productivity ratios in agriculture, namely, production per unit of land area and production per man. However, he went on to suggest that it is necessary to recognise not a single food-energy balance but two. The first relates to the conversion of the energy of the sun into foodstuffs. This is truly the basic balance. The second pertains to use of fossil fuel energy. There is need, on the one hand, to develop cultural practices that reduce the quantity of fossil fuel energy required and, on the other, to search for new strains or even new species of plants that will convert the sun's energy

efficiently at less cost in fertiliser and other materials that come from fossil fuel. From a global aspect, Breimyer also made the point that the richer countries, accustomed to eating the food products of animal agriculture, can achieve substantial saving of fossil fuels by increasing the consumption of cereal foods directly instead of converting them via livestock and poultry. Finally, in view of the high cost of fossil fuel and limited availability, Breimyer stressed the imperative need to protect the resource of the soil more assiduously than in the past.

The 'green revolution' has made it necessary to re-examine public policies in several directions, including technology, employment, credit and marketing and not the least of the areas thus opened up is that of agricultural price policy. In this context, R. Thamarajakshi (21) reviewed the Indian experience since the early fifties and traced the movement in favour of a production oriented price policy for agriculture. She cautioned, however, that a positive price policy is a necessary but not a sufficient condition. The prime mover is technological advance, not only directly but also in facilitating a better response from agriculture to economic stimuli. In this connection she emphasised the significance of well developed market organisations for economic stimuli to reach growers fully, without being lost or diluted at intermediate points.

The considerations urged by McQuigg, Breimyer and Thamarajakshi bear on agriculture as a whole but are of no less concern to small farmers. However, in the present day agriculture in the less developed world, in numbers and area, the small farmer is, as it were, the representative farmer and the progress of agriculture along modern, scientific lines may be measured by the advance achieved by the great body of small farmers. Changes in the organisation of agriculture, however radical and however urgent, will take time, so that the small farmer and the means by which his capacity and productivity may be enhanced form the core of national agricultural policy. Ensminger (27) is not alone in thinking that the small farmer has lived for too long outside institutions serving agriculture. Whether the failure comes from administrative or political and social causes may be a matter of opinion but there is no question that a new institutional structure to which the small farmer can relate needs to be created and this entails new obligations for research institutions, for institutions delivering the recommended inputs, for the marketing system and for government policies in general.

The crux of the problem, as Norman and Krishnaswamy (24) argued, is that for a variety of reasons beyond his control, despite his farming system being well adapted to the environment, the small farmer is caught in a characteristic 'low productivity trap'. Small farmers need types of technology that will be relevant to their specific needs, that is to say technology that is highly divisible (e.g. seeds, fertilisers and herbicides), which is comparatively simple to adopt, will be dependable in return and will require a fairly low level of improved inputs. Correspondingly, there must be an adequate infrastructural support system which can create conditions conducive to the adoption of improved technology. The small farmer must be convinced of the value of the technology; he must be ensured the necessary financial resources for its adoption; and the necessary inputs

must be available to him at the right place and at the right time. The role of the extension agent and of effective communication can be scarcely underestimated. Since the various elements are closely interrelated, the issue of co-ordination has critical importance. The circumstances of the small farmer and the numbers involved inevitably demand decentralised administration of agricultural development programmes. In this context, Norman and Krishnaswamy urged that the ideal administrative strategy is one which treats the village as the basic unit of development or, at any rate, groups of contiguous and more or less homogeneous villages might be treated as units of development. The prime need is for government to create viable institutions at the grass roots level. It is not denied that the task of building up the right kind of institutions and services in support of the small farmer is rendered difficult by the existence of inequalities among farm community members. This very fact calls, in turn, for additional developmental strategies.

The dividing line between the small farmer and the agricultural labourer is often thin. Both are dependent on available opportunity for wage employment either wholly or as an indispensable supplement. Hence the plea advanced by Abercrombie (11) for intelligent use of technology keeping in view the prevailing social conditions and the more specific case made out by Stout and Downing (26) in favour of 'selective mechanisation', defined as mechanisation that will not decrease the demand for labour per unit of land. Stout and Downing recognise and indeed emphasise the positive role of agricultural mechanisation. Rightly, they take mechanisation to encompass the use of hand and animal operated tools and implements, equally with motorised equipment, the common purpose being to reduce human effort, improve quality, perform operations that cannot be done by other means and improve the timeliness of various farm operations. Too frequently, mechanisation systems fail on account of faulty planning and execution rather than the concept itself. Therefore, judicious selection and application of existing machines or their modification requires first a thorough analysis of the production processes on the farm. Only with such an analysis is it possible to ensure rational selection, proper operation, organisation and management, such as may be compatible with local agricultural, economic and social needs. From this aspect, it becomes singularly important to strengthen agricultural mechanisation research, including the effects of various levels and types of mechanisation on employment at the micro and macro level.

Strategies for rural development and the organisation of agriculture

The proposal of the two world conferences on Population and Food represented substantial continuity with earlier deliberations connected with the United Nations Strategy for the Second Development Decade. A common feature of much of the discussion in recent years, both national and international, has been the growing concern with the conditions and opportunities of the poorer groups within the

rural community and the necessity of adopting an integrated approach to problems of rural development. Integration involves, at the same time, a cohesive view of regional or area problems and resources, a unified view of the entire population and special measures and policies on behalf of those segments of the rural community who have in the past remained at subsistence levels. It is natural that the approach of rural development should throw up a wide range of questions, beginning with the concept and its underlying economic and social assumptions and extending to the agencies available, the content of development, the manner in which agriculture as the primary industry is to be organised and the purposes for which the human and natural resources available in society are to be organised and developed. These issues were reflected at the Rome seminar in several discussions and, in particular, formed the theme of contributions by Uma Lele (28), E.R. Krystall (30), John Higgs (29), Elinor K. Kennedy (22) and Tarlok Singh (20). Aspects of the subject of rural development and approaches to it were examined also in papers reviewed earlier by Abercrombie (11), Bhattacharjee (18) and R. Sinha and H.R. Kötter (13). Although, on a theme of such range and comprehension the discussions at the Rome seminar were necessarily selective, they posed several basic questions.

Uma Lele's contribution (28) provided the broad economic background to the consideration of problems of integrated rural development. Her definition of rural development as improving living standards of the mass of the low income population residing in rural areas and making the process of their development self-sustaining provides a useful starting point for considering how rural development programmes may be designed and implemented. As she emphasised, if the objectives of rural development are to be realised, both productive and social services have to be provided simultaneously. But there has to be a 'desirable' balance over time between welfare and productivity as relating to the low income population. This necessitates certain priorities in mobilising and allocating resources. If the low income population are to benefit fairly from rural development programmes, it is necessary that (a) resources should be allocated to less developed regions and classes on a priority basis and (b) the productive and social services must actually reach the 'target groups'. Further, for the rural development process to become self-sustaining, available resources should be used effectively first to augment the productivity of the low income rural groups. Without a major thrust towards increasing their productivity, health, education, nutrition and other services may often fail to produce the desired results.

For the process of rural development to become viable in relation to low income groups and to secure the necessary mass participation, Uma Lele suggested that rural development strategy should be viewed as part of a continuous, dynamic process, thus bypassing choices such as 'extensive' versus 'intensive' or 'integrated' versus 'minimum' effort. In planning and implementing a rural development strategy, the approach should be 'sequential', that is to say, there should be carefully considered time-phasing and clear priorities. The sequential approach places particular emphasis on manpower and institutional development from the

early stages of implementation, so that the scope can be enlarged and modified progressively. Finally, Uma Lele makes the important point, which is implicit in all discussions on rural development, that there must be a national and, in the best sense, 'political' commitment to translate the rural development programmes into appropriate policies and institutions and into the necessary investment priorities.

Before turning to the major issue of pattern of rural development and the organisation of agriculture as an industry, a few of the propositions advanced by Higgs (29), Krystall (30) and Elinor Kennedy (22) should be briefly mentioned at this point. Higgs (29) advanced the view that, though the technical ability to solve the problems of poverty, food and population already exists, the main reason for the relative lack of success of so many rural development schemes lies probably in their failure to involve the people concerned. He went on to examine the factors which inhibit the development of effective democratic farmers' groups and identified these as being (a) the marginality of the majority of peasants, (b) 'distance' between the educated elites and the peasantry and (c) lack of confidence between government and farmers and a certain underrating of the contribution rural people can make to development. The communications gap, which frequently exists between government and the people, has to be overcome but extension services often seem to work *for* rather than *with* the community. Peasant motivation has to be enhanced by providing educational opportunity of a kind that encourages individuals and groups to participate willingly and with understanding in all the processes of development. The problems of very small farmers invariably call for some form of group or co-operative action. However, co-operatives as institutions frequently tend to limit the scope and possibilities of co-operation itself. They do so when they are obliged, under governmental rules and guidance, to restrict their activities to such specific aspects as credit or marketing rather than seek the broader framework of earning and living within the community. Therefore, Higgs urged the need to foster groups with a wider than agricultural objective. Broad-based group action, based on community responsibility, could do much to hasten the acceptance of rural population programmes. He noted with approval the criteria for rural development programmes established by the FAO Freedom from Hunger/Action for Development Programme. These emphasise especially that institutions at the grass roots level should be strengthened and, further, that the essential resources being those of the community, the function of external resources should be primarily supplementary or enabling.

Whatever the scheme of rural development and agricultural change, Higgs' main propositions will hold good. This is equally true of the several constructive suggestions put forward by Elinor Kennedy on the role of women in food production and family planning (22). These suggestions, being derived from wide ranging observation in the Pacific island societies, in Thailand, in Malaysia, in the Philippines and elsewhere, have indeed a general validity and unquestionable importance for the success of integrated rural development strategies.

Krystall's contribution (30) on rural communications systems for agricultural and family improvement fits in well with the suggestions made by Higgs and Elinor

Kennedy. He focussed attention on the need for an effective communications system which can introduce ideas and practices to families with little or no formal education. Such action calls equally for the education of rural families and of all levels of personnel, both governmental and non-governmental. At the same time, all available channels of communication with rural families must be harnessed, including formal and non-formal educational activities, women's groups, co-operatives, the mass media, etc. Krystall spelt out some of the implications of this approach for the training, organisation and functioning of rural extension services. He noted, in particular, that various activities and services should be channelled to rural families to meet their felt needs, not in a fragmented way but in a way which deals with the total problem. This involves teamwork on the part of extension workers accompanied by a shift from individual to group extension. Above all, equally with Higgs, Krystall assigned a central role to the educational aspects of rural development programmes, for families that have learnt the lessons of development in one area of activity will remain open to further messages and will help accelerate the pace of development.

Which pattern of rural development and agricultural organisation to choose for the future, having regard especially to population factors, is a question that faces most of the less developed countries. While in a small number of countries social patterns can now be taken to have been set definitely (as in China, USSR, Eastern Europe and Israel), in the less developed world as a whole, agrarian systems are still in transition and, at best, the fundamentals of future social and economic organisation may be said to be in the process of being established. Rural societies in this situation may be better able to plan their own transition, in keeping with their social, economic and cultural environment, in the light of experience gained in countries with similar conditions, as well as with collectives, communes, Kibbutz, moshav and the *ujamaa* villages. A comparative, but necessarily summary, presentation of these various forms of agricultural organisation and of the problems faced by agrarian systems in transition, is offered by Tarlok Singh in his paper on alternative forms of agricultural organisation in relation to population factors (20).

In view of developmental efforts of the past two or three decades, the expression 'form of agricultural organisation' has come to have a wider meaning than in the past. It comprehends, at the same time, (a) the state of ownership and operation of the typical farm unit or units, (b) the changing distribution of land and of rights and obligations which form the core of the man-land relationship in the economy, (c) levels of techniques employed, (d) institutional services pertaining to agricultural input like fertiliser, seed, water and energy and the extension network and (e) arrangements for marketing and processing agricultural produce. A comparative study of different systems of agricultural organisation suggests that there are strong similarities between the institutional facilities required by farmers in different countries. However, changes in the structure and operation of farm units constitute a critical point in all rural transformation. Examining various factors which bear on the productivity of land and labour, Tarlok Singh came to the conclusion, hinted at already by Abercrombie, Kötter and others, that a progressive changeover from

traditional systems of farm organisation to a system, adapted to the circumstances of each given society, in which all or most of the farm units are able to profit from new technological and economic possibilities, can be expected to raise the productivity of both land and labour. Reconstruction at the farm unit level provides an important means for absorbing and accelerating other changes and for greatly enlarging the gains from development reaching out specifically to those among the rural population who have remained at the margins of subsistence for lack of the minimum security and employment.

Two principal streams of organisational development in agriculture can be distinguished according to whether land is held by individuals or by a collective entity, which may be the community or the state or an agency functioning on behalf of the state. Where land is held by individuals, farm units can be modified or enlarged mainly through some form of consent or co-operation. Careful study of experience with socialist forms of agriculture shows that, if well managed and if individual and group incentives are fairly harmonised, they can be adapted to different stages in agricultural and economic development. They can be modelled to deal with conditions of rapid population growth and pressure on resources as well as those of rapid rural-urban migration and decline in rural population.

In densely populated low income countries with transitional agrarian systems, in which land is distributed highly inequitably, small and marginal cultivators and landless labourers constitute the mass of the rural poor. It is among them that demographic pressures are felt most harshly and immediately. The growth of population and subdivision of holdings (invariably also accompanied by fragmentation) have the effect of increasing the numbers of rural poor. Their poverty is deepened by lack of work opportunities outside agriculture. As several speakers at the seminar pointed out, in these circumstances, work and livelihood for the bulk of the growing rural population can only be found within agriculture and the rural economy. On one side, as Abercrombie pointed out, 'It is certain that the present level of underemployment is much higher than is inevitable' and on the other hand, the economic and social advantages of creation of non-agricultural rural jobs should not be neglected (savings in housing and all kind of infrastructure) and the same is true of the advantages of combined agricultural and non-agricultural activities, as far as it is feasible. The papers presented by Abercrombie (11), Bhattacharjee (18), Campbell (25), Singh (20), Kötter (32), Sinha and Kötter (13) enter more closely into this matter.

In connection with these alternatives and choices, the law of economies of scale should not be conceived too mechanically. In the same way as large agricultural holdings were not under any circumstances, either in ancient or in modern times, the most efficient form of organisation, there is much experience and evidence also today that the success of the one or the other type is not merely a question of technology and economic organisation but also of human relations, of social and political organisation and spirit. The success depends on a remuneration which does satisfy the producer socially, economically and psychologically, with appropriate sharing of income, services and social security (Singh (20) and Kötter (32)).

How, then, could the rural economy be so reorganised and strengthened that there would be both steady growth in agricultural output and increasingly intensive utilisation of available labour resources? In answer to this question, to many students co-operation in farm production, including progressive pooling of land and crop planning, supported by expanding co-operative and state services, has seemed to be an indispensable part of any adequate approach. On the available evidence, it appeared most unlikely to Tarlok Singh that, without transforming agriculture along co-operative lines in a manner suited to the demographic and social conditions of each region, it would be possible to raise adequately or quickly enough the productivity of much of the land and of vast numbers in the present and future labour force. In densely populated countries, as in South Asia, even under favourable circumstances of supply of capital and technology, it was difficult to conceive of the problems of mass poverty and mass employment being resolved without fundamental changes in the agrarian system.

Research in demographic aspects of agricultural development

Discussions in the Rome seminar touched on several questions on which the understanding presently available was felt to be inadequate. The theme could not receive sufficiently close attention and the underlying feeling remained that, perhaps at a future date, more specific treatment of research in demographic problems pertaining to agricultural and rural development might become possible. A general scheme for this purpose was already available in a contribution by S.R. Sen (14). Sen pointed out that, while demographic and agricultural trends could co-exist in a variety of combinations and some quite significant correlations between stages of socio-economic development and demographic trends could be observed, the causes and the effects were not easy to identify. At best, certain broad hypotheses could be formulated about the relative role of social factors, of natural endowments, of science and technology and of economic factors. It was apparent that our understanding, for instance, about which social factors helped acceptance of which particular innovations and at what stages in development, was very inadequate. The situation indeed varied from area to area. A scheme outlined by Sen for classifying areas by rate of population growth, rate of agricultural (or economic) growth, population status, agricultural status and other economic consideration, might be of help in the interpretation of available research into demographic—agricultural relationships and in planning new area studies.

Sen's plea for composite study of demographic and agricultural factors was further reinforced by Eva Mueller (31) who stressed the need for sample surveys of individual farm households, providing agricultural and demographic information for the same families. This suggestion forms part of a broader view in favour of surveys combining agricultural and demographic enquiries. Eva Mueller also noted other important gaps in research presently available, for instance in respect of employment data for women and children, information on children's work (hours,

time use, wages etc.), data on the frequency of intra-family transfer (old age support, migrant remittances, etc.) and data on the economic contribution of children and their economic costs. With Sen, Eva Mueller recognised that economic–demographic relations might differ between economic settings and cultures and that the influence of areal characteristics had to be explored through carefully designed surveys.

The relationship between population and employment, especially rural employment, was not known clearly enough for purposes of planning and policy formulation. There were also conflicts between the several objectives with which social and economic development was undertaken. Abercrombie (11) noted that almost all the studies so far made on possible ‘trade-offs’ between different objectives were theoretical and hypothetical. Yet this was an area in which empirical studies were badly needed, for some of the supposed trade-offs might turn out to be small or temporary or even illusory. Two other questions calling for closer study, mentioned in Abercrombie’s paper as well as in other contributions, concern (a) the assessment of the nature and magnitude of underemployment and (b) the experience of China, where demographic and socio-economic measures appear to have converged so as to bring an appreciable decline in the birth rate and improvement in health conditions and in expectation of life at birth.

One important area in which more needs to be known about demographic aspects is that of nutrition, both at the micro and at the macro level. In this connection, Jean McNaughton (12) noted the great need for documented evidence of cause and effect. The subject of malnutrition is now widely discussed but, she asked, how much do we know about the numbers who are malnourished, their location and the reasons for their malnutrition. Clearly, there is need for applied research in several related areas so that there may be a better base for food and nutrition planning. Among priority areas for research which relate population and nutrition, Jean McNaughton drew particular attention to:—

- (a) methods for measuring a limited number of characteristics that will define the nutritional status of a population or of individuals;
- (b) methods for collecting disaggregated data on food consumption and population;
- (c) consequences of various substandard intakes of energy on different population groups (agricultural workers, pregnant and lactating women, etc.);
- (d) indicators to identify population groups at nutritional risk;
- (e) among socio-economic and cultural factors affecting nutrition, effects of migration from rural to urban areas and reverse influence of urban–rural movement in terms of effects on rural consumption behaviour;
- (f) nutritional implications of government policy on population, agriculture, health, education, etc.;
- (g) possibility of access to benefits of nutrition and health programmes by socio-economic groups most in need of these.

In dealing with population as an integral part of socio-economic development policies, the concept of research has itself to be broadened to include action-research and planned experimentation. Thus, as pointed out in the paper on alternative forms of agricultural organisation (20), solutions would be rendered easier if the transitions in the application of social and technological innovations were based on some degree of testing and conscious experiment. Unless technical and organisational problems are resolved satisfactorily on the ground, patterns of development which may seem feasible in theory cannot be given practical shape on any scale. This is true, for instance, of issues such as dovetailing planning of the use of natural resources with planning for the use of human resources, co-ordinated physical planning of the use of land, water and other resources, methods of allocating and rewarding work, provision of individual and group incentives and methods of integrated planning at the farm unit level and village and area plans. Answers to such questions have to be found through planned experimentation within the social, economic and cultural milieu of each country and region.

International action

Since the early seventies, step by step through the concerns increasingly felt by member-countries of the United Nations there has been a continuing effort to erect a structure for international co-operation and for transfer of resources and technology. The aspirations behind these endeavours have been but partially fulfilled. Even so, the series of international strategies which have been drawn up in the recent past are beacons for the future and landmarks in their own right. Mention need only be made in this context of the International Development Strategy for the Second Development Decade, United Nations World Plan of Action for the Application of Science and Technology to Development, Programme of Action on a New International Economic Order, World Population Plan of Action, World Plan of Action on Integration of Women in Development, the Universal Declaration on the Eradication of Hunger and Malnutrition and the International Undertaking on World Food Security. These and other declarations seek, on the one hand, to give more positive and purposeful direction to international co-operation and, on the other, to enlarge the scope and substance of international action. Thus, Bhattacharjee (18) drew attention to the measures for international action stressed by the World Food Conference and cited FAO's estimate that, over the period 1975–1980, there was need to bring about a four-fold increase in external development assistance to agriculture.

At the Rome seminar, the theme of co-ordination of international assistance for population and rural development was developed, especially from the perspective of the United Nations Fund for Population Activities by H. Gille (15). He recalled the main assumptions which increasingly guided international action in the area of population. These were:

1. promoting population activities within the framework of economic and social development;
2. promoting programmes in support of underprivileged population groups and combating poverty;
3. improving the delivery of assistance at the global and regional levels through greater co-operation and co-ordination between UNFPA and other agencies of the United Nations as well as improved internal co-ordination and planning within national systems;
4. giving primacy to the needs of the poorest countries and building up self reliance within developing countries;
5. seeking integrated action in the area of population through funding population activities increasingly in conjunction with activities in health, education, rural development, community development and other programmes of economic and social development; and
6. determining high and low priority areas for assistance on the part of UNFPA so as to facilitate greater co-ordination and more unified impact between population and other development programmes and, at the same time, to strengthen the population policy and programme infrastructures within each country.

Problems arising from the growth of population and their consequences for agriculture and rural development and the effects of economic and agricultural development on the pattern of population growth reach out to all aspects of national economic and social policy. Therefore, at the Rome seminar, it was realised that adequate policy and action within countries was of the highest importance. At the same time, everything possible had to be done to bring the resources and knowledge of the international community to the support of efforts at the national level.

Notes

- [1] Published initially as Chapter 3 of FAO, *The State of Food and Agriculture 1974*, Rome, 1974.
- [2] Presented to the United Nations World Food Conference, Rome, November 1974.
- [3] D. Ensminger (ed.), *Food Enough or Starvation for Millions* (Tata McGraw-Hill, New Delhi, 1977).

Annexure

Papers contributed to the seminar on Food, Population and Agricultural Development, Rome, 1–5 December 1975.*

<i>Chapter</i>	<i>Author(s)</i>	<i>Topic</i>
7	Robert Agile (United Nations Population Division)	World Population Situation.
8	R.J. Perkins	Demographic Aspects of Long-term Demand Projections.
9	L. Naiken and W. Schulte	Projections of Agricultural Population and Agricultural Labour Force in relation to Agricultural Planning.
10	Wajihuddin Ahmed	More Food Means Fewer Babies.
11	K.C. Abercrombie	Population and Rural Employment.
12	Jean McNaughton	Population and Nutrition.
13	R. Sinha and H.R. Kötter	Population Aspects of Integrated Rural Development.
14	S.R. Sen	Research in Demographic Aspects of Agricultural Development.
15	H. Gille	Co-ordination of International Assistance for Population and Rural Development.
16	H. Breimyer	The Food–Energy Balance.
17	James D. McQuigg	Effective Use of Weather Information in Projections of Global Grain Production.
18	J.P. Bhattacharjee	Population, Food and Agricultural Development: A Medium Term View.
19	Anthony S. Rojko and Patrick M. O'Brien	Organising Agriculture for the Year 2000.
20	Tarlok Singh	Alternative Forms of Agricultural Organisation in relation to Population Factors.
21	R. Thamarajakshi	Role of Price Incentives in Stimulating Agricultural Production in a Developing Economy.
22	Elinor K. Kennedy	The Role of Women in Food Production and Family Planning.

* Chapter references are to Douglas Ensminger (ed.), *Food Enough or Starvation for Millions*.

<i>Chapter</i>	<i>Author(s)</i>	<i>Topic</i>
23	Robert W. Herdt and Randolph Barker	Intensification of Proven Farm Production Practices.
24	D.W. Norman	Communicating Improved and New Technology.
25	Keith Campbell	The Effects of Rapid Urbanisation on Agriculture.
26	B.A. Stout and Charles M. Downing	Increasing Productivity of Human, Animal and Engine Power.
27	Douglas Enslinger	Social and Cultural Constraints to World Food Production.
28	Uma Lele	Integrated Rural Development.
29	John Higgs	Farmers' Organisations and People's Participation in Rural Development.
30	E.R. Krystall	Rural Communication System for Agricultural and Family Improvement.
31	Eva Mueller	Effects of Different Patterns of Rural Development on Demographic Change.
32	H.R. Kötter	Population Aspects of Rural Development: 21 Theses.
33	Stanley Andrews	The Forgotten and the Neglected.