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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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Can we feed the world? — an optimistic note

Keith O. Campbell

'Where there is no hope, there can be no endeavour.'
Samuel Johnson

In spite of the grim forebodings of the doomsday men and the depressing defeatism of some agricultural scientists and economists, I remain sanguine about man's capacity to feed himself in the years to come. The fact that I am optimistic does not, however, mean I am complacent. The overwhelming impression I brought away from the Rome seminar in December 1975 was that, despite the multiplicity of problems of food production and distribution it laid bare, the problems can be overcome if governments are more fully informed, better motivated and act more rationally. But act they must and act more purposefully on agricultural matters than they have done in the past.

Prolegomena

Before outlining some of the grounds for my position, three preliminary points need to be made. First, my comments are not made against a presumed background of unlimited, much less exponential, population growth. Recent UN demographic projections suggest that the world population will reach a peak somewhere between 11 and 15 billion about a century from now [1]. Some demographers would question their ability to make confident estimates beyond the next 15 to 25 years but I believe it is useful to have some idea of the relevant orders of magnitude. In crude terms, then, we have to think in terms of feeding fifty per cent more people by the year 2000 and three times our present numbers in a hundred years' time. I believe this assignment to be well within man's capability.

Second, I am not concerned with a time scale which stretches to the ultimate exhaustion of the planet. It has become fashionable recently for some writers who wish to deprecate the power of science and technology to raise living standards to find philosophical justification for their pessimism in the second law of thermodynamics [2]. Whatever the implications of the law of entropy for the ultimate fate of future generations, it ill becomes agricultural economists from affluent countries to deny less advantaged sections of mankind (at least by implication), the benefits which agricultural science can bring for the relief of human conditions [3].

Regard, of course, has to be paid to possible ecological consequences of particular kinds of technology. But, contrary to the absolutist views of the more strident conservationists, the necessity for trade-offs between environmental costs and other costs should be recognised. It is neither rational nor sensible to pursue public policies on a 'no risk' basis – in accordance with the view that a particular technique or substance should be outlawed if the possibility of its damaging human life is even infinitesimal. It should further be accepted that the relevant trade-offs may vary substantially between affluent and developing nations. The affluent can afford the luxury of restraints on the use of powerful agents for the improvement of human welfare. The developing countries, on the other hand, rightly accord more importance to the well-being of their human population than their country's bird life. Restrictions on the use of DDT and other insecticides in the United States are cases in point.

The resource situation

Turning to the determinants of food production, I see no physical resource restraints within the time horizon posited earlier. The world currently uses less than half the land area potentially suitable to grow food crops and raise livestock [4]. Moreover there is little reason to expect any reversal of the trend towards substituting other inputs for land. It may not even be necessary to have resort to the two major needed technical breakthroughs set out by Pawley in 1971 [5], namely techniques for continuous cultivation in the humid tropics and reduction of desalination costs to permit the use of erstwhile saline water for irrigation. It would be wrong, I believe, to make too much of recent short term difficulties regarding petroleum and fertiliser supplies in considering long term possibilities. Despite the burgeoning literature on energy in relation to the rural industries, world agriculture is a relatively small user of fossil fuel.

Institutional restraints

The ways in which agricultural production is organised and in particular the systems of land tenure in use, clearly have implications for agricultural productivity. The slow rate of expansion of food production is sometimes attributed to the failure of developing countries to proceed faster with land reform.

My own predilection is to discount the immediate need for, and potential benefit from, institutional change. Many countries are still searching for more satisfactory forms of agrarian structure. In these and others the initial impact of hasty reform could prove so disruptive as to do more harm than good in the short term, however great may be the long term benefits [6]. Since the time and effort necessary to effect changes in tenure and other rural institutions are inevitably great, it would seem more fruitful for developing countries to direct their efforts in

the immediate future to remedying deficiencies in their input and their product market systems.

Agricultural research

As regards research, I have confidence in the ability of agricultural and other scientists to effect substantial improvements in the food-producing capacity of the world, if they are given the necessary resources. Even in the more advanced agricultural countries there is only spasmodic reference to, and little hard evidence of, the likelihood of the physiological limits to plant and animal improvement being approached [7]. In any case, past experience suggests that new genotypes will be found or new sources of improvement will come to light. For example, the advent of the Mexican 'miracle'wheats changed expectations about yield improvements in a number of countries overnight.

There is reason to be concerned however about the trivial proportion of the world's scientific resources being devoted to world food production problems and the geographical distribution of such research activities. Evenson and Kislev have estimated that total world expenditure on government agricultural research was $(US) 1.1 billion in 1965 [8]. This might be compared with Barbara Ward's recent estimate of $(US) 250 billion a year for the world's likely expenditure on armaments over the next ten years [9]. If this were a true reflection of man's priorities, there would surely be reason to ask whether there is, in fact, any world food problem. Perhaps, there will be some reassessment of research priorities in agriculture's favour if the situation deteriorates, but clearly much could be accomplished if the scientists of the world were to apply themselves to rural problems in a serious way.

The Evenson-Kislev study also indicates that 89 per cent of the world rural research budget and 83 per cent of the scientists working in publicly financed agricultural research centres were supported by the high income countries. Two points should be made about this situation. First, much of the applied agricultural research is specific to particular regions. The international transfer of new wheat and rice varieties associated with the 'green revolution' was the exception rather than the rule. On the other hand, many of the innovations of the high income countries which do potentially have wider application (particularly agricultural chemicals) do not reach the less developed countries either because of the latter's protectionist trade policies or because of local pricing policies.

The second point is that agricultural research allocations in advanced countries tend inevitably to be influenced by their domestic food situation, often one of surplus or, at least, one dominated by problems of market access. This, combined with the relative decline of the agricultural sector of such countries over time, encourages contraction rather than expansion of subventions for rural research. Thus only limited contributions to food production problems in less developed countries can be expected as a byproduct of research work in affluent countries.

Technical aid programmes, of course, should not be dismissed but they are small in comparison with the magnitude of the problem and they tend to involve applied rather than fundamental research. The development of international research centres (such as CIMMYT and IRRI) by the private foundations also help but they are excessively expensive in anybody's language. It is hard to believe that these are the only, or the most appropriate, way to achieve technological improvements in the agriculture of the developing countries.

The priority given to agricultural improvement by low income countries themselves and the standard of excellence expected leave much to be desired. Preoccupation with industrialisation and with problems arising from abnormally high rates of urbanisation has led to the neglect of their agricultural industries [10].

The braking effect of national agricultural policies

The lack of public concern for the agricultural sector of the low income countries is manifest in other ways than in the neglect of agricultural research. Many policy measures are tantamount to disincentives to food production, even though there is now abundant evidence that farmers in developing countries will respond in an economically rational way to production incentives if they are provided. Many such countries have resorted to controls over food prices in the interests of the urban consumer. Acceptance of external food aid has been allowed to discourage the expansion of domestic food production. Costs of inputs such as fertilisers have been set too high because of import restrictions. Marketing boards have been allowed to divert receipts from international trade and as a consequence producers' prices have been depressed.

The agricultural policies pursued by the high income countries have had equally counter productive effects on world food output and, more seriously, have impeded the efforts of the developing countries to increase their agricultural potential. The negative consequences of the high degree of protection of agricultural products in the EEC, for instance, have been amply demonstrated many times [11]. The insulation of the price structures of countries, the one from the other, not only reduces incentives directly but also discourages production through the enhancement of price instability.

Efforts to resolve this unsatisfactory state of affairs through international negotiation, whether in the forums of FAO, GATT or UNCTAD, have been singularly disappointing due to the attitude of member governments.

A question of priorities and organisation

It would appear then that neither land resources, agricultural technology nor farm people stand in the way of expansion of food production. Such restraints on agricultural advancement as exist are principally of man's own making, taking the

form mainly of sins of omission and commission on the part of national governments.

When inter-governmental conferences and the international agencies which are their servants issue pronouncements on world food problems, they usually shy away from, and are silent on, the obvious facts about the economic mismanagement of member governments in relation to their agricultural industries. Considerations of national sovereignty together with narrow self interest generally stand in the way of the acceptance by individual countries of external criticism or advice, unless manifested as technical aid. It is a pity that the example which the OECD has set in producing more incisive and more challenging criticisms of member countries' policies, is not more widely followed by international agencies. Incidentally, one advantage of the IAAE's association with the FAO in the seminar in December 1975 was that it enabled the latter organisation to throw off some of its customary shackles.

If the foregoing diagnosis be correct, the major problem of world food production is to devise ways of inspiring and influencing leaders and governments, particularly those of the developing countries, to upgrade the standard of their performance with respect to the agricultural sector. One thing is plain. Appropriate motivation is unlikely to be forthcoming as a result of periodic false alarms about imminent disasters. These only serve to encourage the old 'fire! fire!' syndrome. Adverse seasons and other natural disasters seem to do little to encourage positive action as they tend to be dismissed as 'acts of God'.

In most of the developing countries, farmers, despite the relative superiority of their numbers, are usually ineffective in influencing government action. Indeed, in some countries, (in Latin America for instance), governments have even taken steps to repress farmers' organisations because they recognise them as a potential challenge to their authority [12]. In advanced countries, such organisations as well as agriculturally based political parties are losing their basis of power because of dwindling farmer numbers. An early resolution to the problem is therefore unlikely to come through farmer pressure.

Conclusion

To sum up, it is clear that even now there is a wealth of knowledge about methods of achieving agricultural development. What is lacking is knowledge of ways of getting the appropriate action implemented. This is basically a problem in human organisation, not a problem of resources, of technology or of economics.

Notes

[1] United Nations, Department of Social and Economic Affairs, *Concise Report on the World Population Situation in 1970–75 and its Long-Range*

Implications, Population Studies No. 56, New York, 1974, pp. 37–70.
[2] See, for example, N. Georgescu-Roegen, 'Energy and Economic Myths', *Southern Economic Journal*, vol. 41, no. 3, January 1975, pp. 347–381.
[3] I refer, in particular, to Randall's recent derogatory remarks concerning the observations of Schultz and Ruttan elaborated at the previous conference of the IAAE. See Alan Randall, 'Growth, Resources and Environment: Some Conceptual Issues', *American Journal of Agricultural Economics*, vol. 57, no. 5, December 1975, p. 804.
[4] United States Department of Agriculture, Economic Research Service, *The World Food Situation and Prospects to 1985*, Foreign Agricultural Economic Report no. 98, p. 59.
[5] W.H. Pawley, 'In the year 2070', *Ceres*, vol. 4, no. 4, July-August 1971, pp. 22–27.
[6] A.S. Rojko and P.M. O'Brien, 'Organizing Agriculture for the Year 2000', in Douglas Ensminger (ed.), *Food Enough or Starvation for Millions*, Tata McGraw-Hill, New Delhi, 1977, p. 347.
[7] Cf. US National Academy of Sciences, *Agricultural Production Efficiency*, Washington, 1975, pp. 132–149.
[8] R.E. Evenson and Y. Kislev, *Agricultural Research and Productivity*, Yale University Press, New Haven, 1975, p. 16.
[9] *Sydney Morning Herald*, 31 May, 1976.
[10] Keith O. Campbell, 'The Effects of Urbanization on Agriculture', in Douglas Ensminger (ed.), *op. cit.*, pp. 441 and 446.
[11] For example, see D. Gale Johnson, *World Agriculture in Disarray*, Macmillan, London, 1973.
[12] J.W.Y. Higgs, 'Farmers' Organization and People's Participation in Rural Development', in Douglas Ensminger (ed.), *op. cit.*, pp. 507–8 .