

17 International agricultural research for developing countries*

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Most of us are familiar with pictures like that of a little black boy sitting in the dusty sand with a belly swollen by hunger, oblivious to the flies running over his face, and looking wide-eyed into the camera lens. Such images of hunger and deprivation are necessary to keep up the level of our charitable donations to organizations which, often with great effort, make their own contribution to alleviate acute poverty.

These images also provided us with a vision of the Third World as a world of backwardness and stagnation and thus condemned to a permanent dependence on our dynamic, ever-changing First World. However, this is a distorted picture. Of course there are far too many poor and it is true that development is stagnating in a number of countries, but other countries have been laying their own foundations for development and growth, and some have achieved a level of prosperity comparable to that in the West in the 1950s. In contrast to the disheartening expectations at that time, the medical doctor did not steam ahead of the agriculturist. This is not because the Law of Malthus had finally been proved to be true, but because agricultural production has kept abreast of the strongly increasing demand for food.

Despite a threefold increase in Third World population, global food shortages have been averted, and the occurrences of famine have been reduced in both number and size. These have been limited to regions under pressure from war or natural disasters or that have been exposed to instability and political adventurism, as in Sudan at the end of the 1980s and in China during the 'great leap forward', at the end of the 1950s. Even a country such as Bangladesh, confronted with massive food shortages at the beginning of the 1970s, has become almost self-supporting thanks to its record rice and wheat harvests. The fact that the catastrophic flooding in 1988 did not result in enormous actions for food aid six months later, indicates that the country has built up a remarkable resilience.

Agricultural research has contributed a great deal to these unexpectedly favourable post-war developments. In the second half of the 1950s it became clear not only that the agricultural techniques that had been developed in temperate zones were also indispensable in the tropics, but also that attempts to achieve the necessary transfer would be doomed to failure if no appropriate research was conducted in the tropics themselves. The Rockefeller and Ford Foundations had the means and flexibility to provide the necessary momentum to this research.

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Partly continuing the activities started in the colonial era, the institutes they financed were rapidly successful in bringing about a change in Asia, parts of Latin America and several regions in Africa. This has since become known as the 'green revolution'. These days, 20 years later, it has become clear that as far as food production is concerned this revolution did indeed bring about necessary changes for the good, but, as in every revolution, also devoured some of its children in the process of rapid change.

The necessary research efforts soon proved too much for these Foundations. At the beginning of the 1970s, the Food and Agriculture Organization (FAO), the United Nations Development Fund (UNDP), the World Bank and a number of donor countries therefore united to form the Consultative Group on International Agricultural Research, or CGIAR for short (Baum, 1986). In the expansive 1970s, this organization grew to form a system of international research in which 13 autonomous institutes, together with about 30 donor countries share the responsibility for a yearly research budget of over 200 million US dollars¹.

Despite its spectacular growth, this international research constitutes no more than 5 % of the total agricultural research in developing countries. This is because national agricultural research organizations have likewise been growing considerably over the past 25 years, as appears from numerous studies of the International Service for National Agricultural Research (ISNAR) in the Hague. At the same time, the effectiveness of research in Asia and Latin America has been improved by transferring the management of the research to institutions that function at some distance from governments and their respective departments of agriculture, and in which the researchers themselves contribute to research policy and management. The opposite is true in Africa. Here, many bilateral research projects, in which the donor countries and their executors seize the chance to blow their own trumpets, obstruct the potential for developing national research policies. This is not a call to suspend bilateral aid, but it is a plea to apply this aid in such a way that the research systems of the countries themselves are strengthened instead of being trampled underfoot.

International agricultural research will be able to fulfil an essential innovatory and complementary role, particularly within a network of strong national research organizations. Their programming should then be directed at problems that extend across the borders of the individual countries, and should be led both by scientific possibilities and by problems recognized in the field. International research can only continue to function at some distance from the national political arenas and as a consequence only at some distance from the daily problems of the farmer. Therefore, national organizations should play a central role in the identification of the demands for applied international research and for adapting its results at the farm level. Proper dove-tailing requires that the influence of research organizations of developing countries on control, management and execution of international research has to be increased at the expense of the donors and their agents. Transfer of responsibilities to non-governmental organizations of development assistance (NGOs) is no help, becau-

se these have their constituency in the affluent West and cherish, like donor governments, their own ideologies. Changes are overdue, but if made in time there will be a role for multilateral international research in agricultural in developing countries for years to come.

There is enough to be done (CGIAR, 1987). Firstly, there is the population increase. In view of the young age of population, this will continue for the time being, even in those countries making efforts that are beginning to control the problem. Secondly, there is urbanization, which will exceed 50% in many developing countries at the beginning of the next century. Thirdly, there are increasing incomes and levels of aspiration, which express themselves in Western ways of life and a craving for consumer goods which we ourselves are also so fond of, such as cars, motorbikes, transistor radios and bread, meat and vegetables, preferably stacked in the form of 'Big Macs'.

For agriculture, this means that production needs to grow considerably above a level necessary to fulfil the need of the rural areas, and that its composition has to be adjusted to the food demands of an urban population. Furthermore, this food must also be cheap enough to contribute to the alleviation of hunger as a result of poverty. This kind of development is only possible under two conditions. The section of the population that does not participate in agriculture should provide the external means of production that are necessary to increase the productivity of labour and soil, and economic relationships should be such that self-amplifying interactions between agriculture and other sectors of the economy are supported.

Both the political basis and the natural resources are missing for a pastoral development of simplicity and self-sufficiency to keep the malevolent world at bay. On the other hand, it has become evident, particularly in Africa, that policies directed at urban development and at the expense of rural areas, grind to a halt. This is as a result of increasing imports of agricultural produce, increasing problems of marketing industrial goods which do not correspond to the taste and quality requirements of Western society, and an increasing foreign debt. More self-reliance is imperative, and this requires that in most countries most of the internal demand for agricultural products be met by domestic production. Any research policy that does not strengthen the interaction between urban areas and their hinterlands is doomed to failure.

Agro-ecological research carried out over the past 20 years² has demonstrated that most countries have large enough regions where the soils and climate enable adequate agricultural production, providing that external means of production are available, and this without further assaults being made on fragile ecosystems³.

This is also true for Africa, even though the increase in agricultural production to date lags a long way behind that of Asia and parts of Latin America. But, in the same way that it was impossible to transfer the technical developments of the Western world to the irrigated regions of Asia without research, it is also impossible to transfer the technical developments on other continents to the

rain-dependent agriculture in the tropical rain areas and the savannah regions of Africa without research.

These areas require the development of new agricultural systems that enable a greater productivity of soil and labour than the traditional systems. For this purpose, crops other than rice and wheat need to be adjusted to more productive environments than the present. Although such crops, for example maize, millet and cassava, are traditionally consumed in rural areas, they may require new methods of conservation, storage and processing to keep them acceptable for an urbanizing population. Cattle are a necessary component of these agricultural systems to provide draught power, and permanent ground cover is necessary to limit the ever-present threat of erosion from wind and water. Moreover, these systems have to enable efficient use of natural and industrial fertilizers. Many lessons should also be learned from the sometimes disastrous mistakes that have been made elsewhere in attempts to control of diseases, pests and weeds by means of biocides. And finally, it should be taken into account that rapid urbanization may lead to such a shortage of labour in rural areas that some forms of mechanization are needed and herbicides have to be used to lessen the burden of weeding. However, there is still a large gap between what in principle might be done and what happens in reality. The international institutes are in a position to contribute significantly to bridging this gap.

Exports are needed to pay for necessary imports for production and consumption. Therefore cash crops have to be incorporated into some of the agricultural systems and incentives have to be created to make their cultivation worthwhile for the farmer. But rich countries display a disconcerting lack of interest in reforming their egocentric trade policies in favour of the developing countries. Lack of foreign exchange, lack of reserves, the necessity to use scarce external means of production efficiently and the need for cheap food, oblige developing countries to further develop those areas that are better off agro-ecologically and infrastructurally. In many situations, this makes it also necessary to direct development efforts at labour-intensive, family-run farms. Seed stock, industrial fertilizer and biocides can be traded in small amounts, so that, in areas where application of the new techniques is attractive, the smaller enterprises will eventually follow the lead of the larger ones. However, this is of little or no consolation to the smallest farmers. In spite of increasing yields, these cannot maintain their aspired level of income, because they are caught between falling prices for their products and an increasing general level of prosperity ⁴.

Policies that are geared towards the survival of enterprises that are too small to make a decent living, put the cart before the horse, since they drain away the financial resources for creating permanent employment. Therefore, an important task of policy-oriented research is to show potentials for regional development by improving infrastructure and promoting industrial activities and services. At first, such regional development is likely to be driven by agricultural development but in the course of time it should develop its own momentum. This should stimulate geographically distributed urban development instead of the present

uncontrolled growth of mega-cities. John Mellor, the director of the International Food Policy Research Institute (IFPRI, Washington) has written many papers on this theme.

The explicit recognition of the necessity to develop well endowed regions, implicitly involves the recognition of the existence of other regions where development lags behind. This is a relative distinction: agro-ecological and infrastructural situations that are considered poorly endowed in one country may be the best there is in other countries. Furthermore, there are less endowed regions that might be carried over the threshold by relatively simple means, such as correcting the soil acidity, adding micronutrients, building some roads or providing extension. In other cases, more elaborate investments are needed, such as for drainage, terracing or irrigation. Comparative, international agro-ecological research may contribute considerably to a rapid and efficient evaluation of potentials.

However, in every country, there are always regions where structural improvements do not justify their costs, because even with them the production level will be too low, the risks too high and the use of external means of production too inefficient. The problems of these marginal areas are even larger if, as a result of developments elsewhere in the country, the prices of agricultural products come under pressure. The traditional response is emigration of the young and the able to regions with more promising possibilities for agriculture, to cities or to other countries. The remaining population is then forced to sacrifice the limited long-term possibilities for production for the purpose of eking out a short-term meagre existence. Overexploitation as a result of poverty forms the most serious threat for the environment in developing countries.

Therefore, a number of donors of the CGIAR stress that research should focus particularly on improving agriculture in these least endowed regions. However, many problems in these regions are not very different from those in regions that are better off; they are only more severe. Accordingly, much of the agricultural research that is particularly directed towards these least endowed regions, is more readily applied elsewhere⁵, so that their comparative advantage is not increased and their marginalization continues. This is one reason why the contribution of research towards mitigation of inequity is so often disappointingly small. The structural development of poorly endowed regions requires much more substantive collective efforts than research, but the chance that developed countries will be willing to contribute their share is remote. As it is, they grossly neglect their own less endowed regions. And this the more so under the influence of a neo-conservative ideology, which has itself reconciled with the existence of inequity. Nothing suggests that the developing countries have any original ideas on the distribution of power and wealth, and therefore hunger and poverty in the midst of relative prosperity will persist. But this is not a reason to neglect agricultural research that is primarily directed at the increase of production, since problems of distribution can never be solved in situations where absolute food shortages prevail.

There are at least two other good reasons why research directed towards growth and production is still appropriate at a time when, in the shadow of the year 2000⁶, so many of the well-to-do are so concerned about unintended consequences of their prosperity. In the first place, the development of farming systems that are so productive that indiscriminate reclamation of virgin lands can be avoided is a necessary condition to control further degradation of the surface of the earth and destruction of natural ecosystems. In the second place, those countries that have little to lose but poverty and see some silver lining at last, are going to forge ahead anyhow. And as long as I am drinking wine, I am not going to preach that others drink water.

Notes

1 Membership of the Technical Advisory Committee (TAC) of the CGIAR is reshaping my opinion on development research, but not to such an extent that TAC should be blamed for the views expressed in this address.

2 Production potentials were estimated by P. Buringh et al. (1979). Their paper may be considered to be a reaction to the pessimistic view of the Club of Rome. A more recent study was done by FAO (1984).

3 The agricultural production process in low-yielding situations, where many, partly unknown factors interact, is not very well understood and therefore difficult to manage, whereas high-yielding situations require that growth is better controlled and understood, so that inputs may be better timed and adjusted to demand. Accordingly, although more inputs per unit area are needed in high-yielding situations, less of most inputs are needed per unit product. Hence, for the same total production, fewer external inputs are required and wasted, less land is needed for agriculture and more natural ecosystems can be spared. On the other hand, the increased use of inputs on the land that is in use for agriculture may cause environmental and health problems. This is especially the case in developed countries, where external inputs such as industrial fertilizers and biocides are relatively cheap and thus used over-abundantly (see de Wit, 1988).

4 This occurred in all developed market economies, with the exception of Japan. But there the policy of shielding the small farmer has resulted in prices that are about 3–5 times higher than elsewhere.

5 The PPS project (Penning de Vries & Djitéye, 1982) is an example. The objective of the research was to better understand the factors that determine the Primary Production in the Sahel, to benefit the semi-nomads. However, the knowledge gained is increasingly being used in more southern regions that are better endowed with water and infrastructure so that potential pay-offs of interventions are more promising. The International Livestock Centre for Africa (ILCA, Addis Ababa) has also been shifting from the Sahel to greener pastures.

6 'Millenarism' appears to be a breeding-ground for doomsday-like expectations in the Western world, as it was at the end of the first millenium. Because of its biblical and apocalyptic roots (Dasberg, 1980), its impact in developing countries may turn out to be smaller.

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