THE CHANGING DYNAMICS OF GLOBAL AGRICULTURE

A Seminar/Workshop on Research Policy Implications for National Agricultural Research Systems

DSE/ZEL Feldafing
Germany
22-28 September 1988

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Germany
22-28 September 1988

Sponsors:

International Service for National Agricultural Research (ISNAR)
The Hague, The Netherlands

German Foundation for International Development (DSE)
Feldafing, Federal Republic of Germany

The Technical Centre for Agricultural and Rural Cooperation (CTA)
ACP-EC Lom Convention
Wageningen, The Netherlands

Session I
Food Surpluses and Their Research Policy Implication for Developing Countries

Agricultural Policies and Research Priorities

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Introduction

The organizers of this seminar suggested the title of this paper – global food surpluses and their research policy implications. I have chosen a different title, however, because surpluses (and deficits) in agricultural markets are nothing more than the visible consequences of distortions in markets caused by policies.

Instead of focusing on the outward appearance of the issues, I will emphasize the close link between the policies pursued by all nations, each with its own objectives, and the imbalances in the global distribution of food. The character of those policies must be highlighted, together with their effects within countries and on each other through international markets.

At the same time there is the need to describe the chain of causes and effects which link surpluses on one end of the scale to the priorities for agricultural research. It is a long chain in which national policies are one element, the related patterns of agricultural development a second, their implications for world trade a third, and the consequences for food security a fourth. Obviously, current policies are not immovable, but can and will be changed, bringing changes which affect both world markets at one end and people's food security at the other. It compels one to look at alternative scenarios and to ensure that research priorities are established within a framework of expected policy changes.

Being at some distance from agricultural research, I cannot claim to know what programs and achievements characterize that work. This makes me hesitant to pronounce on research priorities. Some of my suggestions may be found less useful, already part of priority programs, or unacceptable for other than economic reasons.

A Policy Perspective

Not all countries in the world are self-sufficient in food. Some are net importers, others net exporters. Over time, net importers become net exporters or the reverse (UNCTAD, 1987). Looking at it from a commodity perspective, the picture is even

more complex because countries import some food items and export others. Against that background, what can be said about imbalances? In that context, what is considered an imbalance?

International trade makes all of this possible; countries exchange goods and services in competitive markets. Countries will engage in international trade when they expect to profit from exports or to save on resources through imports. Ever since the early 19th century, classical economic theory and analysis have centered on this basic notion, which is known as the concept of comparative advantage. It is at the root of international specialization or the distribution of labor (Soderstein, 1971; Viner, 1938). The fact that countries exchange food and other goods and services in international markets cannot be deplored on the ground of imbalances, even though some countries are net importers or exporters. In fact, these international relations are desirable, reflect efficient use of resources, contribute to specialization, and thus to increased welfare in the world. In a world economy without barriers to trade and without distorted national economic policies, that is, in the ideal world of liberalism, no country would be or even want to be, self-sufficient in anything. Trade and world prices would govern the optimal allocation of resources and, thus, the national patterns of trade and production.

Imbalances reflect policies and their effects on resource use, production, trade, and consumption. In the ideal liberal world, markets and prices will offset the threat of imbalances, restore the equilibrium of supply and demand at a specific price, and send a signal to producers and consumers to bring their actions into harmony again. The point of equilibrium differs with and without policy intervention. And it is that difference, and the effects it has on other countries as a consequence of a policy step by one trading country, which is critical to a discussion of imbalances.

Ideal liberal world not feasible

The ideal liberal world without interventions is not feasible, and stating this basic thesis has some rather significant consequences. No country in the world can afford to be without a minimum of public services and public regulation. Apart from an army and police force, a number of services are by their nature monopolistic, and therefore require regulation in the public interest, such as electric power, the telephone service, or drinking water supply. But these services and regulatory activities must be financed. Governments have a range of options to mobilize the required services, and each alternative has implications for the behavior or markets (Parikh et al., 1988). Indirect domestic taxes raise prices and reduce consumption, taxes on imports have a protective effect on domestic producers, and income taxes may reduce savings and investment.

Whatever choice is made, distortions are unavoidably inflicted on the economy. If two

countries which export the same commodity make different choices to finance the same level of domestic public services, their competitive position is liable to be affected, with one country gaining a larger export market share at the expense of the other. There are no international rules to prescribe in what way national governments should finance their domestic public services, nor about what constitutes an essential public service and what its level should be. No economist, let alone politician, would want to defend the thesis that nations should do without some minimum of basic public services and regulation. Implicitly they accept the argument that there cannot exist an economy free from policy-induced distortions.

The consequence is that discussions concerning liberalization, deregulation, and privatization are discussions about alternatives which are recommended to improve present, imperfect situations. The ideal is not a practical alternative because any policy impacts markets and the real variables in the economy.

Intervention to stabilize domestic prices

In addition, it is questionable whether free markets do in all cases maximize welfare, particularly with unpredictable agricultural production due to weather variations (Mellor and Raisuddin, 1988). With imperfect foresight, production decisions by farmers are based on price expectations which may in practice be belied by actual price developments. Farmers may incur costs for being wrong and, for small farmers in particular, these costs may be beyond what they can afford. As a consequence, they choose production patterns which limit their risk, even if this implies on average a lower income.

Farmers insure against excessive fluctuations in their income, and pay for it by a lower average income. At issue then, is the question whether on average higher incomes could be reached if the risks that farmers try to avoid were shared by more people. Sharing among all farmers is one approach, but it is certainly not the most attractive alternative because all farmers face the same basic risks, although some can afford them more than others. The real issue is whether it makes economic sense to share the risks with consumers and taxpayers, instead of leaving them entirely to farmers.

On this issue the views are certainly not uniform among economists. A substantial number, particularly those closely involved with agricultural development policies, take the view that there is economic merit in risk-sharing in which a risk-neutral government takes the lead and adopts a policy which reduces the risk of risk-averse farmers. When the government guarantees stable prices to farmers, their production decisions are no longer influenced, or are at least less influenced, by risk-avoiding behavior, and their production will as a consequence become higher, with higher average incomes over the years.

But there are offsets: a government which adopts a price policy for agricultural products, even if the domestic price is set at a level reflecting current and expected world market prices, also adopts the consequence that it subsidizes imports in years of high world prices, or exports when world prices are low. Conversely it may reap windfall gains when importing at low or exporting at high prices. Even if these cancel out over time, government expenditures are destabilized, and efforts to compensate these fluctuations through countermeasures affecting other expenditures may reduce the economic attractiveness of investments in nonagricultural sectors. On the positive side, these measures will increase agricultural production and probably will also improve the balance of payments through larger exports and/or import substitution.

The argument concerning risk leads to the argument that policies designed to reduce domestic price fluctuations below world market price fluctuations can improve welfare, compared to an open market. It constitutes an economically acceptable basis for government intervention to stabilize domestic prices. It does not provide an argument for setting domestic prices differently from the average or the trend of world market prices; international prices remain the guideposts that in the long run ought to be followed in setting domestic prices. We will return to this issue: in reality many countries engage in price policies that do not heed this rule.

So far, it has been noted that government policies will always exist, because in all countries there is a consensus about some package of public services and their financing, both of which lead to changes in demand/supply balances and market prices. In addition, a case is made for economically justified intervention to dampen the effects of international price fluctuations on the domestic market, specifically for agricultural products. A third area is the government's role in providing rural infrastructure, particularly its role in land development.

Rural investments by the public sector

One might argue that rural public investments are part of the public services discussed earlier. But this is not so clear-cut in the case of land development: leveling, terracing, improving water management, or land consolidation. In most cases these investments are undertaken for private lands to improve productivity in ways that are beyond the capability of the owners or users themselves. It changes the value of the assets directly, enhancing the income-generating capacity of those assets and the tax base of the government. But even if one argues that these investments belong to the category of standard public services, there is still reason to discuss these government activities as a separate issue because they have profound implications for agricultural development.

Governments undertake a large part of these investments because it would neither be possible, nor efficient, if farmers were to do this by themselves. Without investments of

this kind, farmers are hemmed in by the prevailing natural conditions and therefore have a limited choice of cropping patterns and crop technologies. Generally speaking, farmers are more constrained when land is not developed, whereas their risks are highest when land is not level, not protected against erosion, and not provided with the means to manage the water regime.

Cropping patterns respond to changes in expected net revenues per hectare more readily in areas where land is in an advanced stage of development (Bhalla et al., 1984). New technologies which affect expected net revenue are adopted mainly in those areas, and not in regions that lack the means to control water. Two different questions lead to different arguments about technological progress in agriculture. One addresses the scope for technological change in agriculture, given the existing levels of land development. This leads to farming systems research and the identification of the constraints governing prevailing production patterns, usually concluding that farmers have rather small margins for change and adoption. The other question addresses the scope for new investments in land development and the possible effects on the adoption of new technologies. The first is an essentially static approach, but attractive as an extension of the agronomic research undertaken by international and national research institutes. The second is a dynamic approach at the level of investment planning which is clearly beyond the scope of agronomic research, but at the same time very important as an activity crucial to technological progress.

The issue of imbalances as a function of government policies can and should therefore be extended to government investment policies in rural infrastructure, and specifically to land development programs. Differences from country to country, both in terms of what the present generation inherited and current land development activities, are quite large. Efforts by governments to ease the constraints imposed on farmers by their natural environment fundamentally determine agricultural growth and national food markets.

Dynamics of land development

What determines the scale of a government's efforts to improve the land base? Opportunity is undoubtedly one factor, sadly lacking or small in some countries, abundant in others. Need is another, when a growing population and the risk of ever-increasing food imports point to the high priority of land development. Whether these investments are always economically sound, even if they are technically feasible, is a matter of considerable debate, particularly in sub-Saharan Africa. Although the question is relevant in terms of allocating scarce resources, there is always the lingering suspicion that much of the cost-benefit analysis of land development programs leaves a lot to be desired in terms of benefit assessment in particular. That suspicion is made stronger when looking at past land development activities which have resulted in highly

productive agricultural activities in regions which today would be considered too expensive to develop. My home country, the Netherlands, is such an example.

The history of land development therefore causes one to be rather careful in the use of the comparative advantage concepts. In a static sense it may have a lot to say about a country's pattern of trade, but investments in infrastructure and public amenities, including those related to land development, may change comparative advantage over time. The safest statement to make is that the process is as yet not well understood. In turn, this suggests that a somewhat liberal attitude in undertaking land development projects may prove to be justified.

Summarizing, there appear to be several types of government interventions which cannot be abandoned, are beneficial in terms of welfare, or which in the long run affect comparative advantage itself. Together, these constitute the baseline for our analysis. National policies may adversely affect other countries through world markets. In the absence of a world authority which constrains national policies, this is unavoidable.

Also, to say that governments should not intervene, leaving economic regulation to market forces, is to suggest an objective which is not feasible. We have to live in a world where the choice is not between having intervention or not, but where limits may be recommended on the kinds of interventions which countries may apply. And even then, one can expect to be faced with large gray areas which cannot easily be classified in terms of their acceptability.

Objectives and Instruments

Nothing has been said so far about why national governments want to intervene in agriculture and the supply of food. Probably the most common purpose is to maintain a reasonable degree of self-sufficiency for those products which are staples. Behind this objective is the fear of overdependence on suppliers from abroad, particularly if they are few. Self-sufficiency arguments have historically played an important role and still do. The agricultural policies of the EC and Japan contain elements of self-sufficiency, and it is at the heart of policies in most developing countries.

In the course of development, the role of agriculture in terms of its share in output, exports, and employment tends to decline. Income elasticities of food demand decline once a major part of the population is well fed and there is a continuous risk of oversupplying food markets, leading to relative price declines and slow growth of real incomes generated by the agricultural sector. If migration out of agriculture does not compensate for slow overall growth of agricultural income, then incomes may fall further and further behind those in nonagricultural pursuits on a per capita or a per

household basis. Governments may then want to intervene to improve the relative income position of farmers.

These two objectives – self-sufficiency and farm incomes – are the dominant motivating forces behind agricultural policies. Self-sufficiency objectives are common worldwide, but income policies are mainly found in the industrial countries which can afford their costs. There are also two sets of instruments used, prices of agricultural products and inputs, and nonprice measures. Within each set, there are further options.

A third possible objective is different – the eradication of hunger. The links between agricultural growth and the demand for food are complex, and the objectives of promoting agriculture and eradicating hunger may even be inconsistent (Parikh and Tims, 1986). The interests of food producers and food consumers may lead to competing demands on the government's scarce resources and to opposite views on price policies. A majority of the poor are landless, and it is unlikely that they will be absorbed in agricultural activities that would provide them with the purchasing power to adequately feed themselves and their families. Nonagricultural employment is in the long run their only hope to escape from poverty. Investments to generate that employment compete for resources with the agricultural sector, as do subsidized food distribution schemes which are intended to relieve the worst effects of poverty. Reliance of the poor on market supplies of food gives them a strong interest in low food prices, whereas farmers producing a marketable surplus will have an opposite interest.

Meeting the food needs of the poor is no doubt an objective of many governments, but not one that is easily reconciled with objectives of food self-sufficiency in market terms, or with farm income objectives.

Policy-Induced Problem Areas

Two characteristics of policy making in the areas of food and agriculture bedevil the global scene. One is that agricultural and food policies are made independently by nations, primarily for domestic objectives. There are no international treaty obligations or codes of conduct that restrict national policies. There is an extensive network of international agreements which limit the use of some major trade policy instruments, vested primarily in the GATT (General Agreement on Tariffs and Trade). But agricultural products have remained outside its reach, having been explicitly excluded at the time the agreement was drafted. Only recently, in the Uruguay round of trade negotiations, has there been willingness – reluctantly no doubt, by some – to include agricultural products in these negotiations.

The second problem concerns the instruments used to obtain national policy objectives. A country pursuing self-sufficiency in a basic staple may do so in a variety of ways: increasing the price of the desired product, subsidizing some major inputs, or even providing free land development to farmers. Tax exemptions, cheap credit, and free extension services are equally usable means. But the effects on the balance of payments and on the country's trade relations may be quite different, in turn affecting other countries differently through world markets.

Different policies may achieve the same results in terms of self-sufficiency for the commodity in question, but may do so at different levels of demand, supply, and price. As a consequence, purchasing power of consumers is affected differently, and other markets of goods and services must find a different equilibrium. It is to be expected that the composition of external trade is also affected, with different compositions of both imports and exports. As a consequence, friction arises between countries, which question the acceptability of each other's policies. Many countries reject such complaints about their policies.

At the same time the formulation of national agricultural and food policies has become more complex. The days when it could be assumed that promotion of agricultural production would directly lead to a better food situation for most people are far behind us. The Asian countries in particular are approaching a state of self-sufficiency in market terms, with small alternating imports or exports. Increasing production further, beyond domestic market demand, would push these countries into volatile export markets if they are able to overcome infrastructural and quality constraints. If they can, domestic food prices will decline, maybe even more than is necessary to become competitive in world markets. This lower cost of food will no doubt benefit poor consumers, in particular the rapidly growing category of urban dwellers and rural landless households. But production will continue to increase when production costs of staple foods can be reduced simultaneously through new technology and through rural investments promoting its adoption.

Problems of balance

These choices between staying on the net-import side of self-sufficiency or pushing on to become a permanent net exporter – even if quantities exported remain small – are very hard to make. The implications for food supplies to the poor and for wage costs of nonagricultural activities suggest pushing into a net-export situation. If farmers' choices for their production patterns are limited, the effects of lower prices to them may not be so large that the country will again lapse into net imports. This may be the case, for example, with irrigated rice in South and East Asia.

If farmers can more easily move to other crops, much will depend on the policies that the country adopts for those, making sure that prices are set for all agricultural products in ways that ensure that surpluses can be exported, or at least that domestic production can compete with imports. Balancing the interests of both large and small producers and of consumers (including the poor), along with the need to save or earn foreign exchange within the limited resources of governments, has become a difficult act for almost all developing country governments.

These issues of general economic policy which arise as a corollary of agricultural and nutritional concerns are no longer the only ones. Economic issues are made even more complex, and decisions harder to make, because of a growing awareness of the ecological constraints of agricultural development. Loss of soil fertility, the dangers of unlimited river diversions for irrigation, and the risks associated with the use of chemicals in agriculture are examples. Health problems associated with some of these practices can no longer be omitted from discussions concerning agricultural development.

And finally, returning to the start of this discussion, there are increasing international frictions and tensions in the areas of agricultural growth and trade which cannot be ignored by national governments. In a world that is becoming increasingly interdependent, countries can no longer unilaterally exclude their policies from the international agenda. The potential costs of maintaining that stance are becoming too high. This adds an element of international political concern to the formulation of national policies, as their impact on other countries through world markets may bring repercussions that can wipe out the advantage of the policy measure itself.

All of these factors lead to a renewed assessment of existing national policies, both in terms of their internal and external effects. Policy changes require assessments, and a large part of the hesitation to discuss and negotiate can be attributed to the feeling that changes lead to new uncertainties. What happens when countries no longer create artificial barriers between their domestic prices and world market prices? Or if they abolish input subsidies? A major reason for this uncertainty is the large distance between the actual policies adopted by national governments compared to what would seem economically justified. Adjusting policies to the point where they become more economically rational is a very big step that is unavoidably resisted by interest groups which have grown accustomed to the benefits of government intervention.

Rent-seeking is a natural pursuit for all who try to cajole their governments to maintain or increase their rent income derived from government policies. Agriculturists, traders, consumers, and government officials themselves are all, to various degrees, making efforts to extract from their governments the commitment to protect their real incomes. Economic theory suggests, however, that this not only tends to lead to a less

equitable distribution of income, but also to a smaller size of the total cake. Moving towards economically more appropriate policies will be hampered by the beneficiaries of the existing interventions, at best making the process slow, and at its worst, even impossible. Food riots when staple food prices are brought closer to world market prices, or spilling food in the main streets by farmers objecting to price reductions, indicate that these issues cannot be expected to be easily solved at the negotiating table.

Agricultural and Food Policies: Intended and Unintended Effects

Policies that are centered on domestic objectives are intended to sort specific effects in the domestic economy, particularly for the group(s) of people to which the policy is explicitly addressed. The effects these policies have on other countries are usually not taken into account and if at all referred to, are not considered relevant because there are few internationally agreed-upon rules that restrict domestic policy options. In addition, there are other domestic effects which are not foreseen at the time when the particular policy is enacted, or at least not expected to be important. In fact these may only become visible over time.

Some of these indirect, longer-term, and often unintended effects will briefly be reviewed here, notably in relation to policies geared to self-sufficiency and/or to relative improvement of farm incomes. Domestic effects are discussed first, followed by an overview of international consequences.

Welfare losses through biased price policies

When a country sets domestic prices independently of the world market, it loses because the allocation of scarce resources is shifted away from their most efficient use. Many countries striving for a self-sufficient supply of staple foods have offered farmers relatively favorable returns when compared to other crops. In many developing countries these price relationships between crops were created by governments which at the same time kept the overall level of producer prices low compared to world prices. This is most obvious in the case of overvalued exchange rates. It reflects an element of food policy – keeping food prices low for consumers – but is also defended as a way to extract resources from the agricultural sector to finance nonagricultural investments.

These policies have caused significant changes in cropping patterns, particularly in developing countries. Availability of new technologies for some food crops has added to these shifts when land development and infrastructure permitted, and the new technologies added to the relative attractiveness of a crop in terms of net revenue. It is not at all certain that higher prices for agricultural producers in general would have

brought about a much higher rate of overall agricultural growth, because most of the evidence suggests low overall supply responses to higher relative prices of agricultural versus nonagricultural products. Supply constraints are to a much larger extent associated with the characteristics of subsistence farming – the physical conditions, and the lack of infrastructure for marketing and processing.

Shifts of agricultural production patterns were the result of price policies by themselves, even more so when associated with new technologies. Particularly in Asia, where the investments in land development have in the past been substantial, price policies did lead to self-sufficiency in market terms for major food grains, i.e., in terms of meeting domestic market demand from mostly domestic supplies. It should be remembered, however, that major sectors of the populations of those countries still remain hungry because they lack the purchasing power to buy adequate food on the market. Agricultural development by itself cannot resolve that problem.

The focus of policies on major staple foods can also be expressed as a relative – but in fact sometimes absolute – neglect of other crops and livestock products. For example, the major crops in Pakistan that were the focus of policy attention substantially increased their share of total cropped acreage and agricultural value added. The country has remained an important exporter of cotton and rice, and has become self-sufficient in wheat, but it faces rapidly increasing foreign exchange expenditures on vegetable oils, sugar, milk, and meat. It may well be that the prevailing natural conditions in Pakistan would be better suited to crops other than wheat, which it could import more cheaply than the commodities for which the country is increasing its import dependence.

The inefficiency of cropping patterns measured at world market prices is one consequence of these price policies. Another consequence, particularly for Africa, is more concerned with the relative prices of all agricultural products which are kept low compared to nonagricultural products. To a large extent this situation is a result of strong protection for the industrial sector, which places agriculture in a disadvantageous position. It may not have significantly slowed agricultural growth, but it has reduced the efficiency of domestic industries, employment growth, and real consumption below feasible levels.

Self-sufficency and income policy goals

A policy of self-sufficiency in basic staple foods, when pursued by price policies that drive wedges between domestic and international prices, affects welfare, employment, and consumption. The policy objective is not necessarily to be rejected for those reasons because there are other arguments – particularly political – which may weigh

more heavily in the decision-making process. But one should be clear about their economic costs.

What applies to self-sufficiency policies applies also to farm income policies when those are pursued through managed prices. The price wedges driven at their borders by the EC, Japan, other European countries, and for some products by the US and Canada, have their economic costs – as distinct from budgetary outlays – because they increase the internal costs of agricultural products and make the rest of the economy less competitive.

Income objectives can be achieved by a variety of policy alternatives. Where price supports to farmers are favored, particularly in the EC, one needs to raise the question whether the selected option is the most efficient. It appears that a large part of the costs supported by consumers paying higher prices and taxpayers supporting the EC budget do not reach the farmers, but rather finance large stocks and subsidies to consumers outside the EC through export subsidies. Direct income supplements with a limited intervention in agricultural markets may be a more efficient alternative. Apart from actual cost saving, this may also lead to less distortion of markets and price formation, and thus a smaller overall loss of welfare.

All of these policies, which intervene in markets and separate domestic from world prices, change production patterns when the natural and physical infrastructure does not permit accelerated overall growth. If the level of land development, infrastructure, and market access do not impose constraints, higher prices will accelerate agricultural growth. Taking the EC as an example, high producer prices, which for many years seemed to be permanent, provided the incentive to invest in agriculture. Banks had few doubts about the return of credit extended to farmers because there was little market risk. The availability of financing, together with a strong demand for advanced technology, provided a powerful incentive to agricultural research. Agricultural production and productivity now exhibit strong upward trends, supported by widespread development and adoption of new technologies. These trends now seem to be invulnerable to lower prices, at least in terms of the impact of price reductions in the first few years after policies have shifted.

The focus on self-sufficiency for staple foods and the income support policies which tend to concentrate on major farm products, have significantly shifted the global balance of supply and demand. Asian countries would probably still be large importers of food grains, the EC would not have become a major net exporter of several commodities, Canada might not be self-sufficient in dairy products, nor the US in sugar, if these selective supports had not applied. As a consequence, world supplies are larger than demand. World market prices are low, compelling some countries to subsidize their exports to avoid large stocks. In the end, world markets balance,

although at prices which are not profitable for major traditional exporters. It is more appropriate to describe the situation of the past 10 to 15 years with the term *distorted*, rather than unbalanced, markets.

Africa and USSR – Another story

It is doubtful whether the rising import dependence in Africa should be attributed to inappropriate price policies. Low relative prices to farmers have obviously discouraged farmer production for the market, but it is unclear whether a better price policy would have made Africa less import dependent. One reason is that the absence of even remotely adequate marketing infrastructure and transport systems makes market prices almost totally irrelevant for a large segment of the farmers. Second, a major bottleneck is scarce labor, given the level of agricultural technology. Improvements in that technology require closer linkages to the national economy and are hampered by the same lack of infrastructure.

But even if the infrastructure were improved, technology delivered to the farmer, and surplus production sold at a price that gave a reasonable return to the farmer, there would still be doubt whether food production would be significantly affected. Small subsistence farmers are mainly women and the risks of farming are synonymous with the risks of life. When those are high because land is not developed – such as unleveled land without any water control – the willingness to change practices may be impaired. Price policies should not be neglected in Africa, but import dependence may continue to grow notwithstanding sound price policies.

Similar arguments apply to the Soviet Union, which has been a major food importer for the last 15 years. The prices paid to farmers may need to be raised (and more of the collective income may need to be distributed to members on the basis of actual contributions), but major bottlenecks will remain in handling, processing, and transporting agricultural products. Many years of high investments in these supporting facilities will be needed, together with major programs of water control, to reduce import dependence.

Without the food demand from the Soviet Union and the rising imports of Africa, world prices of major agricultural commodities would be lower than they are now. Surpluses created at one end of the scale by inappropriate price policies are to some extent compensated by inadequate investment policies in the rural areas in other parts of the world. This tends to highlight the importance of a view of agricultural development which embraces both the price/input/technology side and the composition of investment activity.

In the end, inappropriate combinations of investment and price policies distort market factors. African agriculture is labor intensive with low returns; agriculture in the Soviet Union is similar. It makes labor scarce and too expensive in the nonagricultural sectors and draws capital away from agriculture. In the EC, the competitiveness of the nonagricultural sectors is reduced by high food prices as an element of wage costs, drawing more investment resources towards agriculture than world prices warrant.

Potential Remedies and Cures

There are two reasons why the present agriculture and food policies around the world will change: the disappointments experienced with the policies of the past, and the international frictions they have brought in their wake. The current phase is therefore one of change. Depending on the objectives, it may also be a phase of promise.

One should, however, note that the changes that are coming about in agricultural and food policies, both nationally and possibly also through international agreements, are only to a limited extent concerned with the promotion of a more rational economic use of resources. Many countries want to reduce the budgetary costs of farm and food policies and avoid surpluses that cause international tension and bring possible retaliation. The instruments used for these purposes do not necessarily also promote a more economic allocation of resources. The EC's inclination to use quantitative production controls, rather than to reduce price supports, is such a case.

The proposals the US has submitted to GATT on agricultural trade are at another extreme. They aim to completely dismantle all agricultural support measures and thus move strongly towards free trade. Other countries have submitted less far-reaching proposals which will move in the same direction. In the developing countries, steps are also being taken in that direction as part of structural adjustments. It is therefore reasonable to assume that in the next 5 to 10 years there will be a gradual change of policy towards agricultural free trade.

Several studies have estimated the effects of free trade on agriculture (Parikh et al., 1988). Although the methods differ a good deal and the results must be interpreted with care, some of the results are strikingly similar. One is that world market prices for a number of agricultural products will establish themselves at a higher level, primarily because subsidized exports will disappear. Another finding suggests that countries that reduce their agricultural protection reap a benefit in terms of higher GDP growth, with gains in the nonagricultural sector overcompensating for the loss in the agricultural sector. This is found particularly in the industrial countries, whereas developing countries show a more mixed pattern of net gains and losses.

The fact that the effects of moves towards free trade seem to produce a net economic benefit should not be taken at face value. The more important point may be that different groups are affected differently within countries. In the EC, farmers stand to lose, but consumers and taxpayers may gain. In exporting developing countries, farmers will mostly gain and consumers lose; in importing developing countries, the same will apply if governments permit domestic prices to rise to world price levels. In many developing countries, there will be rural gains and urban losses, but in the industrial world, the opposite will occur.

These internal differences are of considerable political and social importance. They may become major barriers to change as categories of people will insist on their right to be supported by the government, whether they are farmers in the rich countries or urban consumers in the developing ones. Governments will in many instances not be able to extricate themselves from the conflicts associated with policy changes without committing themselves to some kind of compensation. How this is to be done, who will be compensated, to what extent, for how long, and where the financing originates are the issues that arise in internal discussions, once international pressure makes a move towards free trade likely.

One particular feature of possible moves toward free trade needs to be emphasized. All available evidence from existing studies suggests that the effect of these moves on world hunger is negligible. This is particularly true when the industrial countries liberalize, but the developing countries do not do so. But even if the latter join in this policy move, the positive effects on the reduction of hunger remain small. This should not come as a surprise, as most of the poor depend for their food supplies on markets; higher world market prices reduce their real purchasing power. Slightly positive effects may be felt in some of the poorest countries, because a large segment of the poor are still agricultural tenants or laborers; they would participate in the benefits from higher prices for agricultural products.

Future Consumption and Production Trends

There is one basic feature of the future food balance which deserves some emphasis – the dominance of consumer demand. Because food is a basic need of a growing world population, consumption projections are barely affected by alternative price and income assumptions. This is also true in many of the more advanced developing countries with low incidences of hunger and malnutrition, but to a lesser extent in the poorest countries of South Asia and sub-Saharan Africa, which harbor the vast majority of hungry people. But even in those countries, a large segment of the population with adequate food supplies exhibits a limited food-consumption response to price and income changes. The overall response in those countries therefore

depends on the distribution of the benefits of economic growth, with a relatively more limited response in the case of more inequitable distribution of income growth.

Therefore, the dominant factor behind growth in consumption is the increasing world population. Different assumptions about income increases and price developments entail only limited changes in food consumption. One of the major features of consumption patterns in the long run is the changing composition of the diet. The demand for food grains for direct human consumption grows more slowly, while the demand for dairy products and, to a lesser extent, for other livestock products grows more rapidly. The demand for food grains for animal feed rises somewhat because of increased consumption of livestock products. There is a clear shift in consumption patterns, particularly in developing countries, toward more expensive foods. This shift is pronounced because a fairly large number of countries, or large population segments in these countries, are passing through a phase of income growth in the years ahead where the demand for the traditional staple foods is fully met, and increased income fuels a shift to more expensive food rather than to the direct consumption of larger quantities of traditional foods.

In a scenario which assumes no change in present agriculture and food policies, developing countries continue to favor the production of food grains and export crops. Their output of livestock products does not rise sufficiently to meet domestic demand, and they become increasingly dependent on imports, particularly of dairy products. At the same time, food grain imports continue to increase, but at a lower rate compared to past years. Most growth of food grain imports takes place in the more advanced developing countries, to a large extent to meet feed demand.

Continuation of present policies implies that the major potential suppliers of livestock products – the industrial countries – set prices independently from world market prices. Rapidly rising demand on world markets therefore does not meet with responsive supplies, and as a consequence livestock products become considerably more expensive. At the same time, slow growth in the demand for grains gradually reduces world market prices as worldwide production continues to be promoted. With gradual removal of protectionist policies, the world market picture changes significantly, notwithstanding little change on the consumption side of the balance. Production changes, measured both in terms of domestic production patterns and their geographic composition, are slightly larger. Trade, which is a small proportion of agricultural production and a residual between consumption and production, shows substantial changes both in volume, geographic patterns, and prices.

When trade is liberalized, the most significant change occurs in food grain prices, which rise significantly in world markets as a number of suppliers have to withdraw from the world market or become net importers when border protection is removed.

This is particularly true for wheat in the EC, rice in Japan, and coarse grains in a number of smaller producing countries which are currently either exporters or importers. For wheat and coarse grains, the volume of world trade is reduced compared to the baseline scenario, reflected particularly in lower imports (for feed use) by middle-income developing countries. World trade in rice expands substantially as Japan becomes a net importer, mainly from Thailand and from small Latin American and Asian exporters.

At the same time, the removal of border protection leads to further world price increases for livestock products, and a substantial expansion of international trade. For dairy products, there is a major reduction of EC exports and the US becomes a major importer, as is Japan. Canada and New Zealand are major beneficiaries, but a number of Latin American, African, and Mediterranean countries also become significant exporters. Many developing countries expand their meat production, reducing imports or moving into exports.

All of this suggests the importance in the years ahead of focusing on the livestock sectors in developing countries, and on the feed inputs for that sector.

Research Priorities

The foregoing does not suggest a straightforward research agenda, but indicates a number of issues for discussion. For example, it would probably be incorrect to conclude that rice and wheat research should be de-emphasized, because appropriate varieties have yet to be developed and adopted in a number of countries. But particularly in Africa, further work should recognize that economically attractive land development is of prime importance as a precondition for technological progress. In a number of cases it may be preferable to adopt this more comprehensive view of agricultural development opportunities, rather than to focus research largely on adaptation to existing physical circumstances.

Changing consumption patterns justify a focus on crops which are important for the livestock sector, including not only feed grains and crops that provide nutritious by-products for animal feeds, but also specific fodder crops which can be fitted into prevailing cropping patterns. In many countries, the major constraint to livestock production is not the efficiency with which animals convert feed into livestock products (thus focussing on the genetic properties of animal breeds) but rather that existing herds are severely undernourished; research must emphasize enlarging and improving the animal diet as a means of discouraging the growth of herd sizes. These are complex issues which require improved markets for livestock products, veterinary services

combined with insurance facilities for livestock holders, in addition to more and better feeding. But research on feeding and fodder crops has a major contribution to make.

Oilseeds deserve more attention, not only because of expected changes in human consumption, but also to improve animal diets. In many developing countries production has stagnated and imports are increasing, reflecting the neglect of these crops by past agricultural policies. Vegetable oil imports deny the livestock sector a nutritious by-product. Developing countries which produce valuable feeds like molasses and oil cakes export these products rather than using them in the domestic livestock sector. This is directly related to EC price policies which put a premium on substitutes for grain because of high internal grain prices in the EC. In many cases it would be appropriate to levy an export tax on these commodities to lower their domestic price and thus to make them more attractive to the domestic livestock sector.

It will also be useful to focus the discussion of research priorities more on production systems, rather than on individual crops, because the activities of most smallholders and their choices are hampered by only marginally improved land, and by a poor rural infrastructure. Focussing on one or two crops is clearly not the best way to improve their opportunities. Farming systems research leads to a better perception of the constraints they face, but ultimately research must encompass land development opportunities in order to visualize ways to change production patterns and to bring about development. Technological change may falter unless accompanied by measures to improve the prevailing physical conditions through appropriate investment programs.

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