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Integration of Agriculture in the National and World Economy: Implications for Agricultural Policies in Developing Countries

Three facts characterise the growing interdependencies and uncertainties of world agriculture today. One is the rise of the marketed surplus as a share of agricultural output, indicating the growing commodification of agriculture and its increasing exposure to terms of trade movements, be they the result of market forces or of institutional interventions. The second is the rapid growth in international trade for agricultural products and the concomitant increase in food and feed dependency for Third World countries, particularly those incurring rapid rates of economic growth. The third is the increasing instability of prices of tradable agricultural commodities measured in domestic currencies where a significant share of this instability originates in international capital movements and exchange rate fluctuations. This growing integration of agriculture in the national and world economy substantially redefines the options and dilemmas which Third World countries face in the design of strategies of food security and in the making of agricultural policy. I explore in this paper some of the policy options available to developing countries, stressing the role that interdependencies and uncertainties play in the choices that can be made to improve their food security. Of course, there exists no unique and immutable policy package so that the purpose of this discussion is not to provide solutions but to help identify the options available and guide the reasoning in making choices.

MULTIPLICITY OF OBJECTIVES AND PRICE INSTRUMENTS: REDUCE THE NUMBER OF OBJECTIVES OR INCREASE THE NUMBER OF INSTRUMENTS?

One of the great difficulties in using prices as a policy instrument is that they fulfil a large number of contradictory functions. Prices affect both economic growth and social welfare and this in a contradictory fashion since prices are a source of revenue for certain classes and of costs for others. Low agricultural prices can stimulate industrial growth but lead to agricultural stagnation; they can raise the real income of consumers but lower that of producers and reduce employment opportunities for

landless workers. There also exist conflicts between short- and long-term redistribution objectives obtained through price manipulation since the short-run effects obtained for a given supply of agricultural commodities are often the opposite of the long-term consequences once the impact of prices on output growth has been felt. The contradictory effects of price policy as a joint growth and welfare instrument are evidenced by simulations in computable general equilibrium (CGE) models for India (de Janvry and Subbarao 1984) and Egypt (Dethier 1985; de Janvry and Subramanian 1985). In the short run, price increases induce supply response and increase the real incomes of farmers with holdings large enough to have a positive marketed surplus. Even though output growth in agriculture creates employment for the landless and stimulates industrial growth (India), higher food prices decrease the real incomes of landless rural workers and of urban workers and the urban poor. In the long run, if prices are allowed to fall under the pressure of increased supply, the real incomes of net food-buying classes increase while those of net-selling farmers fall. The greater the elasticity of supply response, the more the price incentives to agriculture induce industrial growth through sectoral linkages, final demand, and savings-investment effects.

A similar dilemma between growth and welfare effects occurs with food subsidies which are financed out of public investable funds. For India, CGE model simulations show that decreasing urban food subsidies to increase public irrigation investment is expansionary on GNP. The urban classes are hurt in the short run by the loss of subsidies; but enhanced productivity benefits the rural classes immediately, and growth benefits the urban classes in the future as well. In Egypt, when a foreign exchange constraint exists, targeting food subsidies on the poor and diverting to investment the value of subsidies formerly received by the rich is expansionary, deflationary, and increases the real income of all classes except the urban rich. These studies indicate that equitable growth can be reached by a combination of investment allocation toward labour-intensive sectors with high potential productivity gains, such as irrigation of small farms producing mass consumption goods, and targeted subsidies to protect the poor until the income effects of increased investment benefit them.

It is because of these contradictory functions of prices that most governments are reluctant to leave the determination of prices to market forces and try instead to control their effects through a whole range of institutional interventions. Some of the objectives of these interventions are to protect consumer welfare, to generate public revenues, to enhance farm incomes, to create foreign exchange earnings, to increase food security, to stabilise prices, to improve nutrition, and to redistribute income among regions and individuals.

A central dilemma of price policy is, thus, that too few instruments are expected to satisfy too many objectives. The resulting mismanagement of price policy leads to stagnation of production and rural poverty, a phenomenon all too widespread in the less developed countries (LDCs).

Two solutions exist. One consists of reducing the number of policy objectives. This is, in essence, the neoliberal solution which abandons concerns with welfare and assigns to prices (left to determination by market forces) and to individual initiatives the role of efficient resource allocation. The other consists of increasing the number of instruments in order to relieve prices from fulfilling many of the functions which state intervention has attempted to achieve through them. Rural welfare can, for example, be enhanced by land reform and by increasing peasants' labour productivity; public revenues can be raised by land taxes; the nutritional status of the poor can be improved by employment creation and income transfers; etc. Thus, increasing the number of policy instruments allows the confining of prices to the role they best perform: to serve as guides for the efficient allocation of resources in an institutional context moulded by structural interventions.

In this case, prices of tradable goods are determined by border prices at an equilibrium exchange rate and price of non-tradables by equilibrium between supply and demand. This allows elimination of price distortions against agriculture that have typically originated in overvalued exchange rates and protectionism to industrial inputs. Eliminating these distortions permits the removal of credit and input subsidies in agriculture which are sources of socially discriminatory institutional rents introduced in compensation for unfavourable product prices. Price policy interventions remain necessary, however, to manage a system of flexible exchange rates, to stabilise prices, and to supervise through protectionism the transition between price regimes – particularly if the farm sector contains large segments of peasants with limited alternative options in the economy. Short of structural policies that redistribute assets and income (e.g. land reforms), food subsidies are also necessary for that segment of the population with insufficient access to land and employment opportunities.

INVESTMENT PRIORITIES: AGRICULTURE OR INDUSTRY?

Most developing countries have passed through a phase of import substitution industrialisation followed, in the most successful cases during the last 15 years, by a phase of export-led growth. The feasibility of these two development strategies is now limited: the first because of inefficiencies, which indiscriminate protectionism has created, and of increasingly inegalitarian income distribution induced by a luxury goods bias in industrial production and the second because the present international market conditions severely limit exports of industrial products on the markets of industrialised countries.

In the present international economic context it thus seems that an investment strategy that favours food production in the context of peasant agriculture or of labour-intensive business farms and that induces industrialisation on the basis of agricultural growth is the most appropriate to ensure both sustained growth and improved welfare for the

masses of the population, at least in countries which still have large rural populations. The history of South Korea and China, both mainland and island, as well as that of the industrialised countries in the eighteenth and nineteenth centuries, shows the possibilities of an industrialisation led by accelerated agricultural development. Rural development-led growth recently has been advocated for India by Mellor (1976) and South Korea by Adelman (1984). For the latter country, Adelman shows how the reallocation of investment from the services and industrial consumption goods sectors to rice production leads to GNP growth and to equality in income distribution which are both greater than in the current strategy of export-led industrialization. Key to the success of this development strategy is to stimulate productivity growth in agriculture and to control the forces of the technological treadmill so that the fall in prices lags behind the fall in costs. Also essential to the results of this strategy are an extensive redistributive land reform; human capital formation; labour markets that perform to translate productivity gains into wage gains; and an industrial sector, most likely created in a prior phase of import substitution industrialisation, able to respond to domestic demand inducements.

The CGE results for India of reallocating investment away from industry toward irrigation infrastructure for wheat production show, similarly, that this is expansionary on GNP and progressive on the distribution of income. Only large farmers lose if the fall in prices associated with increased output is not mitigated by some price protection. In Egypt, CGE results also show that increasing the share of agriculture in total investment increases the GNP and raises the real income of all social classes.

AGRICULTURAL DEVELOPMENT: THROUGH PRICE OR NON-PRICE INSTRUMENTS?

The neoliberal school insists on the need to improve the terms of trade for agriculture, to stimulate production, and to reduce the size of the public sector – the latter, in particular, to decrease the surplus that it extracts from agriculture. It is, for example, the philosophy of the Berg report for accelerated development in sub-Saharan Africa (The World Bank 1981). Even though it is certainly necessary to set prices at the equilibrium level determined by market forces, it is also fundamental to realise that (1) this price system is necessary but not sufficient to induce agricultural development and (2) there exist technologies and structural alternatives that allow raising agricultural output faster and with more progressive consequences on income distribution than price incentives.

The reason prices have a limited inducement effect is that aggregate supply elasticity tends to be low in the LDCs. This is, for instance, the case of Africa where estimates of this elasticity range between .05 and .15 (Bond 1983). This is due fundamentally to the lack of new technological options, to constraints on farmers for access to modern inputs and to

exhaustion of possibilities of horizontal expansion. Under these conditions increasing agricultural prices result in income transfers from consumers (and, proportionally, the poorest ones) towards producers with the largest marketed surplus. An effective use of price policy thus requires prior structural change to 'elasticise' the aggregate agricultural supply response.

The CGE model for India shows that the poorer classes (landless agricultural workers, small farmers who are net buyers of foods, and urban workers) benefit from a policy of technological change in agriculture with flexible prices while they are negatively affected by a policy of price support which has as a purpose to stimulate output under conditions of inelastic supply (de Janvry and Subbarao 1984). Comparing the two alternatives of increasing wheat production via a system of farm price incentives (with food subsidies to maintain consumer prices at an unchanged level) and groundwater irrigation and high-yielding varieties, shows a present value cost advantage of the latter over the former of 650 per cent at an interest rate of 8 per cent.

The key to agricultural development is, thus, in the implementation of policies of structural change even if these are more difficult to carry out than are simple policies of price incentives. They must include policies to decrease dualism, reabsorb surplus labour and increase labour productivity through technological change and human capital formation.

THE COST OF UNEQUAL SECTORAL DEVELOPMENT: WHY CAN THE SUCCESS OF SOME SECTORS CREATE POVERTY?

During the 1970s, many countries had a very rapid growth in some export sectors while other sectors producing tradable goods stagnated as a result of the success of the first. When populations are trapped in those stagnating sectors the result can be extensive poverty unless compensatory measures financed by export earnings are instituted. The booming export sectors have typically been primary sectors (petroleum and natural gas) or agricultural sectors with strong international comparative advantages (tea, coffee, animal feeds, drugs, etc.). They have created massive inflows of foreign exchange. Similar effects can originate in the rapid build-up of international debt or in international capital inflows, for instance, through foreign aid. In all cases, the success of a sector generator of foreign exchange creates two types of perverse effects on the sectors' producers of tradable goods, such as domestic industry and the food sector. The first is a reallocation of resources toward both the booming export sector and the sector of non-tradable goods (services and construction) for which demand increases as a result of income effects in the export sector. The second is a negative effect on the domestic prices of imported goods which results from the inflationary pressures created by incomes in the booming sector and the resulting tendency for real appreciation of the exchange rate. The availability of foreign exchange allows the avoidance of a devaluation, always unpopular with urban

sectors, and thus the maintenance of low domestic prices of food items and industrial goods.

If the peasantry is principally a producer of staple foods and if fluidity in the reallocation of resources is insufficient to allow peasants to shift their resources to the production of the export or nontradable sectors, the peasantry finds itself cornered in a stagnating sector under unbearable price conditions. The result is outmigration toward the employment opportunities created by the expanding sectors. If employment creation is not sufficient, the result is poverty and often hunger.

The wisest approach is to pace the inflow of foreign exchange earnings to avoid inflationary pressures, an approach successfully followed by, for example, Cameroon. Short of this, five options are available to protect the peasantry from the negative consequences of this unequal sectoral development. Since in many situations the earnings of the export sector create public revenues, these revenues can be used to finance the reforms implied by each of these options:

1. Help the peasantry shift its resources to the booming sectors. This was the case, for example, with peasants producing coffee and cacao in the Ivory Coast and with some family farmers who entered fruit production for export in Chile. Since these export products are often capital intensive (tree growing and irrigation for sorghum in Mexico), assistance to peasants requires important credit programmes and technical assistance as well as a stable insertion in international marketing circuits.
2. Increase the total factor productivity of peasants in food production to enable them to compete with low-priced imports. This is the objective of projects of integrated rural development and of research to improve traditional peasant production systems.
3. Protect the food items which compete with peasant production, support farm prices above consumer prices or subsidise farm inputs to compensate for unfavourable product prices. This is the solution that Mexico successfully implemented under the Lopez Portillo administration showing how part of the booming sector revenues can be used to compensate the losers in the tradable sectors. With falling oil prices and the debt crisis, this high-cost programme had to be sacrificed to austerity.
4. Create enough employment opportunities in the expanding sectors to allow the absorption of the peasants ruined by low food prices.
5. Increase the degree of peasant household food self-sufficiency by allowing them to reduce dependency on purchased inputs and satisfy directly a greater share of consumption needs. This implies, in particular, promotion of organic technologies and garden plots as survival strategies.

STRATEGIES OF FOOD SECURITY: FOR WHOM?

The two extreme solutions to food security are generally untenable: food self-sufficiency because it implies excessively high costs; and direct

application of the theory of comparative advantage because it is static, implies risks which are too high and has negative effects on some sectors of the population which are not competitive in an open economy and find themselves dispossessed of sources of revenue. Most countries have attempted to defin strategies of food security which make a balanced combination of these two extremes. The problem is, however, not only to define a strategy that gives access to a national consumption vector with high probability but also to insure food security for all segments of the population. As recent experience with the Green Revolution has demonstrated, in India for example, strong agricultural growth is not sufficient to satisfy this latter definition of food security.

Food security has two aspects: the level *and* variability of satisfying nutritional requirements. It is met through the combination of availability and entitlements where, as has been shown by Sen (1981), small changes in availability can create large changes in entitlements. Availability derives from both domestic production and trade so that the choice variables are what to produce for national consumption, what to produce for export and what to import. Sarris (1983), for example, shows that aggregate Egyptian food security can be improved by reallocating resources between food (cereals) and cash (cotton) crops. The food security problem is defined as the maximisation of the risk-discounted expected value of net export receipts of the agricultural sector subject to satisfying both a fixed national consumption vector and technical and resource constraints in production. The greater the degree of national risk aversion, the more food crops should be substituted for cash crops at the cost of a reduced net foreign exchange contribution of agriculture.

Access to food in both level and variability is defined differently for different social groups: for subsistence peasants it depends on access to resources and productivity; for landless farm workers and net-buying marginal farmers on employment, wages, and low food prices; for net-selling farmers on favourable terms of trade and productivity; for urban workers on employment, wages, and low food prices; and for urban marginals on food subsidies and income transfers. Using a CGE model for South Korea, Adelman, Berck, and Gordon (1982) show how the two components of food security (level and variability) affect differentially specific social classes. Although in that country subsistence farmers are the worst off in terms of average consumption level, the social group with the highest risk of food deficiencies is the urban marginals who are heavily affected by price fluctuations resulting from instability in both domestic production and world prices. Improving food security of different social groups thus requires different policy instruments. For subsistence farmers it calls for policies that can raise their mean income, while it requires for the urban poor policies that reduce their vulnerability to instability.

In Egypt, food insecurity originates in both international price movements and fluctuations in domestic yields; but the first source of randomness has a coefficient of variation 3.8 times larger than the

second. Among social classes, fluctuations in international prices and yields affect most the real income of the urban rich through the positive economic growth effects that both rising yields and falling world prices have on overall economic growth. High variability in international prices under conditions of extreme food dependency implies that the coefficient of variation in the real income of the poor is larger in the urban sector than in the rural sector. As in Korea, improving the food security of the rural poor requires raising their level of entitlement, while improving that of the urban poor requires reducing the variability in their entitlements. In India, which is basically a closed economy and where food insecurity originates principally in fluctuations in the yields of food grains, it is the rural poor who are most exposed to the fluctuations in entitlements which yield fluctuations create. Among the rural poor it is the landless workers whose access to food varies most since yield fluctuations create, in the short run, proportional fluctuations in employment opportunities. Falling output thus hurts them both through falling employment and through rising food prices which lowers their real wages. In this case, improving the food security of the poorest requires use of policy instruments that both raise the level and reduce the variability of their food entitlements.

With an increasingly integrated agriculture in the national and world economy, it is important to shift the analysis of food security away from that of the stabilisation of food availability and of food prices to that of security of food entitlements for all segments of the population. This focus shows that a complex package of policies needs to be used for this purpose, including yield stabilisation; optimum allocation of resources between domestic food and export crops; price stabilisation though variable tariffs, currency reserves and storage; and food subsidies for critical groups.

FOOD AID: COMPLEMENT OR SUBSTITUTE TO RURAL DEVELOPMENT?

There is no question that international food aid to refugees and the starving is necessary. But long-term food aid is more questionable. It has often been denounced as a means (1) for reducing the pressure to implement the necessary reforms to improve food production; (2) for lowering prices for domestic food producers; (3) for creating price uncertainty since food aid is erratic; and (4) for encouraging consumption habits (e.g. wheat in the tropics) or types of agro-industries (e.g. wheat mills in Peru) which domestic production can no longer supply.

A more careful analysis of the impact of food aid in Latin America reveals, however, that the same instrument – cheap concessional food imports – can be used with markedly different results according to whether it is an explicit component of a strategy of food security or a substitute to the definition of such a strategy. In Colombia, for example, PL-480 wheat imports have depressed domestic prices, eliminated wheat

production from commercial farms and increased wheat dependency from 30 per cent of total consumption in the early 1950s to 90 per cent in the late 1970s. In Brazil, by contrast, the state sells the concessional wheat imports at a price higher than what it pays and uses the revenue created by this transaction to offer domestic producers a price above that paid by the mills. In contrast to Colombia, instead of competing with domestic production, food aid provides a source of public revenues to finance the transition toward greater food self-sufficiency (Hall 1980). In other countries, food aid has been used to finance food-for-work programmes.

In analysing the impact of food aid on agriculture, it is also important to distinguish between short-run and long-run effects. In the Egyptian CGE, when food subsidies are financed by foreign aid, increasing food subsidies is strongly expansionary on GNP as it creates a net inflow of foreign exchange. In the short run, falling food prices hurt all net-selling farmers and increase the real incomes of the urban classes. In the long run, however, the strongly expansionary effect that increased foreign aid creates results in positive real income gains for all classes, both urban and rural. The income effects created by foreign aid thus lead to increased demand for food which both benefits domestic agriculture and increases the demand for commercial imports.

It has often been said that the food-surplus, developed countries prefer to give food aid to reduce their surpluses rather than to provide developmental assistance to Third World agricultures which would eventually lead to reduced opportunities for commercial exports. This is a fallacious interpretation of the potential of aid in stimulating food exports from developed countries. Successful agricultural development in the Third World creates strong income effects which result in increased cereal imports of food grains in the poorer less-developed countries and feed grains in the middle-income developing countries (MDCs). Rapid growth in the Third World stimulated by aid, in particular led by rural development on a broad 'unimodal' basis, will be, for the decades to come, the best guarantee of expanding export markets for food and feed grains produced in the more-developed countries.

I thus conclude on an optimistic note of the possibility of harmony between rapid rural development in the LDCs, to reduce malnutrition, *and* increased export demand for the MDCs, to reduce food surpluses and the associated farm income or public budget crises. Foreign aid to accelerated rural development can thus be to the advantage of both LDCs and MDCs.

CONCLUSION

Probably the most important conclusion derived from this analysis of an agriculture increasingly integrated in the national and world economy is the predominant importance of macroeconomic and of inter-sectoral forces on the production performance of agriculture and on the

distribution of welfare gains that it creates. The trade-offs implied between growth of different sectors, security of food entitlements for different social groups, and short versus long-run effects, are far from intuitively obvious and were partially captured in the results we presented from multisector, multiclass economic models for India and Egypt. In this new context, Third World countries must, consequently, design their agricultural policies and their strategies of security of food entitlements with a clear understanding and an explicit quantification of these trade-offs.

REFERENCES

Adelman I., 'Beyond Export-Led Growth', University of California, Department of Agricultural and Resource Economics, Working Paper no. 309, Berkeley, April, 1984.

Adelman, I., Berck, P., and Gordon, K., 'Food Security in a Stochastic World', University of California, Department of Agricultural and Resource Economics, Working Paper no. 251, Berkeley, December 1982.

Bond, M., 'Agricultural Responses to Prices in Sub-Saharan African Countries', IMF Staff Paper no. 30, 1983, pp. 703–26.

de Janvry, A. and Subbarao, K., 'Agricultural Price Policy and Income Distribution in India', *Economic and Political Weekly*, vol. XIX, nos. 52 and 53, December, 22–9, 1984.

de Janvry, A. and Subramanian S., 'The Politics and Economics of Food and Nutrition Policies and Programs: An Interpretation', University of California, Department of Agricultural and Resource Economics, Working Paper No. 349, Berkeley, June 1985.

Dethier, J. J., 'The Political Economy of Food Prices in Egypt' (unpublished Ph.D. dissertation), University of California, Berkeley, February 1985.

Hall, L., 'Evaluating the Effects of PL–480 Wheat Imports on Brazil's Grain Sector', *American Journal of Agricultural Economics*, vol. 62, no. 1, February, 1980.

Mellor, J., *The New Economics of Growth: A Strategy for India and the Developing World*, Cornell University Press, Ithaca, 1976.

Sarris, A., 'Food Security and Agricultural Production Strategies Under Risk in Egypt', University of California, Department of Agricultural and Resource Economics, Working Paper no. 249, Berkeley, March 1983.

Sen, A. K., *Poverty and Famines: An Essay on Entitlements and Deprivation*, Clarendon Press, Oxford, 1981.

World Bank, 'Accelerated Development in Sub-Saharan Africa: An Agenda for Action', International Bank for Reconstruction and Development, Washington, DC, October 1981.