

Selection VII.A.2. Agricultural Development Strategies*

Several main lessons have been learned in the last two decades about the functioning of the agricultural sector and its potential role in the development process: the emergence of the agricultural sector into a general equilibrium perspective; the recognition of the importance of macroeconomic policy for agricultural performance; the necessity (and feasibility because of the potential for technical change) of rapid economic growth to deal with the human welfare concerns that stem from poverty and hunger; and the superior performance of trade- and market-oriented systems in achieving this growth. These lessons do not define a single strategic approach to agricultural development, however. In fact, three sharply different paths would seem to be open for appropriate policies toward agriculture that view development of the sector as a means to an end—as part of the effort to speed the overall process of development—rather than as an end in itself.

The Alternatives

The first path has parallels to the philosophy of the 1950s, in which benign neglect of agricultural policy was thought to be sufficient for stimulating the process of economic growth. This perspective grows out of the recognition of the role of well-functioning markets and decision makers operating in a world of “rational expectations.” In this view, most policy is irrelevant to farmers in more than a very transitory sense, and this is especially true of price policy. . . .

In this world, agricultural incomes are determined by employment opportunities outside agriculture, the agricultural sector *must* decline in proportional output terms and absolutely in the labor force, and the long-run decline in basic agricultural commodity prices due to technical change simply emphasizes that society is best served by getting resources out of agriculture as rapidly as possible. Although the clearest case for this view of the world is in the OECD countries, a host of middle-income countries, and even some quite poor countries, are also facing the problem of declining real incomes in the agricultural sector under the impact of rapid

technical change domestically and lower world prices for the resulting output. This perspective is obviously consistent with the view that open economies will show better performance than those with substantial trade barriers.

A sharply different path has been sketched by Mellor and Johnston (1984). Building on their earlier stress on balanced growth (1961), Johnston and Mellor call for an “interrelated strategy” that improves nutrition in one dimension while it fosters the broader growth process in the other. The approach calls for a major role of government in strategic design and program implementation, a role that is in marked contrast with the free-market approach sketched out above.

We have, therefore, emphasized that improvements in nutrition [one of Mellor and Johnston’s key objectives for agricultural development] require a *set of interacting forces*: accelerated growth in agriculture; wage goods production; a strategy of development that structures demand towards high employment content goods and services; increased employment; and increased effective demand for food on the part of the poor. Agricultural growth not only satisfies the need for food to meet nutritional requirements (which is the other side of the wage-goods coin), but fosters a favorable employment-oriented demand structure as well. Agriculture’s role in generating a structure of demand, favorable to rapid growth in employment, is central. (pp. 567–68, emphasis added)

Mellor and Johnston go on to summarize their earlier argument that agriculture can play this multiplicity of roles only if a unimodal development strategy is followed, that is, one in which a broad base of smallholders are the central focus of agricultural research and extension services and the recipient of the bulk of receipts from agricultural sales. The authors see the dualism inherent in bimodal strategies—those placing modernization efforts primarily on large, “progressive” farms while neglecting the “backward” smallholders—as the major obstacle to putting their set of interacting forces in motion.

The most common barrier to the interrelated strategy indicated is pronounced dualism in capital allocations—too much to industry and the unproductive elements of the private sector rather than to agriculture, and to capital intensive elements within those, as well as to large-scale and therefore capital-intensive allocations within agriculture. The outcome of the strategy will depend upon national-level decisions about macroeconomic policies, exchange rates, interest rates, and investment allocations among sectors and regions, not just within agriculture itself. Indeed, the whole strategy fails if it is viewed sim-

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ply as the responsibility of agriculture ministries. (Mellor and Johnston, 1984, p. 568)

This interrelated strategy must be directed by government planners; there is relatively little concern or role for the private sector, other than small farmers. The analysis leading to the strategy remains heavily influenced by closed economy considerations, and little attention is given to either domestic marketing activities or their relationship to international markets. Three key elements are suggested as essential to meeting all objectives of agricultural development—massive investment in human capital through nutrition, health, and family planning services in the countryside, creation of the complex, rural organizational structures seen in Japan and Taiwan that provide services to small farmers while also serving as a voice for their interests, and investment in rapid technical change appropriate to these small farmers in order to raise agricultural output and rural incomes simultaneously.

Notably missing in this list of key elements is significant concern for the structure of incentives for agriculture relative to industry or for the country's tradables relative to foreign competitors. Although it is realized that the macroeconomic setting is no doubt important to agriculture, it remains outside the scope of appropriate strategy for agricultural development. Not surprisingly, given the argument in Johnston and Clark (1982), the intellectual foundation for this strategy lies in rural development, not in a vision of agriculture linked to the macro economy and world markets by powerful market mechanisms. It is this latter vision which provides the third potential path for agricultural development strategy for the rest of the 1980s and into the 1990s.

The third approach contrasts with both the "free market" and "interrelated strategy" approaches. It calls for government policy interventions into market outcomes but uses markets and the private marketing sector as the vehicle for those policy interventions. This "market policy" approach recognizes widespread "market failures" in agriculture as well as extensive "government failures" in implementation of economic tasks. The strategic dilemma is how to cope with segmented rural capital and labor markets, poorly functioning land markets, the welfare consequences of sharp instability of prices in commodity markets, the pervasive lack of information about current and future events in most rural economies, and the sheer absence of many important markets, especially for future contingencies involving yield or price risks.

One powerful lesson of the postwar development record is that direct government interventions to correct market failures frequently make matters worse by inhibiting whatever market responses were possible in the initial circumstances, without providing greater output or more efficient utilization of resources. The agricultural sector in particular is vulnerable to well-intended but poorly conceived and managed state organizations that attempt a wide array of direct economic activities, including monopoly control of input supplies, capital-intensive state farms, and mandated control over crop marketing and processing. As Bates (1981) has demonstrated, these direct controls and agencies have a strong political economy rationale for a government that tries to reward its supporters and centralize power and resources in the hands of the state (see also Lipton, 1977).

The answer to the dilemma over making matters worse, in this approach, is to gain a much clearer understanding of the necessary interaction between the public and private sectors. . . . Political objectives for the performance of agriculture—its capacity to feed the population regularly and cheaply, or its ability to provide fair incomes to farmers caught in the pressures of successful structural transformation—are inevitable and, in some long-run sense, highly desirable.

The "market policy" path argues that these objectives are best served by making carefully considered interventions into the prices determined in markets, not by leaving markets alone or by striving to reach the objectives through direct activities by the government. If the "free market" approach incurs heavy political costs as markets relentlessly redistribute incomes to the winners in the course of economic development, and the "interrelated strategy" incurs heavy managerial and administrative costs as the government plays an active and direct economic role, the "market policy" approach incurs heavy analytical costs.

These analytical costs come from the need to understand each country's path of structural change, the workings of factor and commodity markets, and the potential impact of macro and commodity price interventions on these markets and ultimately on the structural path itself. It requires that government intervention be based on an empirical understanding of economic responses to a change in policy and the political repercussions from them. There is an important role for models in illuminating where to look for these responses, but the models themselves cannot provide the answers. This is especially true as attempts are made to build into the models the

response of policy itself to changes in the economic environment. Such endogenous policy models may reveal some of the historical factors that accounted for policy shifts, but they seldom provide a sense of when the degrees of freedom for policy initiative are about to expand. Frequently, this is in times of crisis. Policy makers often embark on bold experiments in such times, and the payoff would be very high if sufficient analytical understanding already existed in order to anticipate the response to a policy change.

Agricultural Policy and Structural Change

Hayami and Ruttan (1985) have asked why agricultural growth has not been faster and more evenly spread around the world:

We indicated that the basic factor underlying poor performance was neither the meager endowment of natural resources nor the lack of technological potential to increase output from the available resources at a sufficiently rapid pace to meet the growth of demand. The major constraint limiting agricultural development was identified as the policies that impeded rather than induced appropriate technical and institutional innovations. As a result, the gap widened between the potential and the actual productive capacities of LDC agriculture. (p. 416)

This perspective, with its emphasis on the relationship between policy and agriculture's role in structural change, has provided the organizing theme for this selection. The progression of topics has followed from understanding why the agricul-

tural sector is different from the industrial and service sectors and how the differences condition the nature of effective policy interventions. The factors needed for inducing the agricultural transformation, to "get agriculture moving," involves a complex mix of appropriate new technology, flexible rural institutions, and a market orientation that offers farmers material rewards for the physical effort they expend in their fields and households and for the risks they face from both nature and markets.

References

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Note VII.A.2. *Induced Technical and Institutional Change*

Hayami and Ruttan have presented an "induced innovation" model to explain growth in agricultural productivity:

The model attempts to make more explicit the process by which technical and institutional changes are induced through the responses of farmers, agribusiness entrepreneurs, scientists, and public administrators to resource endowments and to changes in the supply and demand of factors and products.

The state of relative endowments and accumulation of the two primary resources, land and labor, is a critical element in determining a viable pattern of technical change in agriculture. Agriculture is characterized by much stronger constraints of land on production than most other sectors of the economy. Agricultural growth may be viewed as a process of easing the constraints on production imposed by inelastic supplies of land and labor. Depending on the relative scarcity of land and labor, technical change embodied in new and more productive inputs may be induced primarily either (a) to save labor or (b) to save land.

The nonagricultural sector plays an important role in this process. It absorbs labor from agriculture. And it supplies to agriculture the modern technical inputs that can be substituted for land and labor in agricultural production.

The critical element in this process is an effective system of market and non-market information linkages among farmers, public research institutions, private agricultural supply firms, and political and bureaucratic entrepreneurs. It is hypothesized that the proper functioning of such interactions is a key to success in the generation of the unique pattern of technical change necessary for agricultural development in any developing economy.¹

According to the theory of induced technical innovation, progress in agricultural technology is largely an endogenous phenomenon. As formulated by Hayami and Ruttan, the theory states that the high price associated with a scarce factor of production (e.g., land) induces farmers to choose technologies that conserve the scarce factor. A rise in the price of land relative to the price of labor induces the substitution of labor for land. Or mechanization relaxes labor constraints. Or new high-yield seeds and fertilizer relax land constraints. But the advance in technology is itself a function of institutional innovation. Therefore, farmers exert political pressure to induce institutional innovations that will advance technological change (e.g., by public research institutions or institutions of land reform). Shifts in the demand for institutional change are thus induced by changes in relative factor supply and technical change.

Evidence in support of the Hayami-Ruttan theory, however, has been questioned: see Michael Lipton with Richard Longhurst, *New Seeds and Poor People* (1989). Lipton and Longhurst also place more emphasis on the need for a global research and planning apparatus that will give more attention to the effects of modern agricultural technologies on the poor. In particular, they argue that research must focus not only on increasing output, but also on generating employment, on provision of cheap calories, and on the "full social systemic influences" of any new seed or technology.

Recognizing some special characteristics of the institutional structure of an agrarian economy, Braverman and Stiglitz have presented another interpretation of technological innovation in agriculture. They investigate two common beliefs: that landlords have used their control over the means of production to direct the development and adoption of technologies that have increased their own welfare at the expense of workers; and that interlinkage between credit and tenancy markets provides an impetus to the resistance of innovations: innovations that make tenants better off reduce their demand for loans, and thereby make landlords—as creditors—worse off.

Those who apply purely competitive models dismiss these beliefs, arguing that if an economy is competitive these results would not occur.

Braverman and Stiglitz, however, point out that, contrary to the competitive model in many

LDCs, sharecropping contracts are widely employed, widespread unemployment prevails, and there is not the full set of risk and capital markets required by the competitive paradigm.

Under these different institutional conditions Braverman and Stiglitz conclude that

- (i) landlords may wish to—and can—resist innovations which unambiguously increase production whenever sharecropping contracts are employed.
- (ii) conversely, landlords may adopt innovations which not only lower the welfare of workers, but even lower net national product.
- (iii) the presence of interlinkage may, indeed, affect the adoption of a new technology; however, the reason for this is only partly related to the effect of innovations on tenants' borrowing. Indeed, innovations may increase as well as decrease the tenants' demand for borrowing.²

Notes

1. Yujiro Hayami and Vernon W. Ruttan, *Agricultural Development: An International Perspective*, rev. ed. (1985), pp. 4–5; for a detailed exposition, see also Vernon W. Ruttan, "Innovation and Agricultural Development," *World Development* (September 1989).

2. Avishay Braverman and Joseph Stiglitz, "Landlords, Tenants and Technological Innovations," *Journal of Development Economics* (October 1986): 313–32; see also Selection VII.A.3.

Comment VII.A.1. The Green Revolution

Studies of the Green Revolution include T. T. Poleman and D. K. Freebairn, eds., *Food, Population, and Employment: The Impact of the Green Revolution* (1973); Clive Bell, "The Acquisition of Agricultural Technology," *Journal of Development Studies* (October 1972); Bruce F. Johnston and J. Cownie, "The Seed-Fertilizer Revolution and Labor Force Absorption," *American Economic Review* (September 1969); John W. Mellor, *The New Economics of Growth* (1976); C. Wharton, "The Green Revolution: Cornucopia or Pandora's Box?" *Foreign Affairs* (April 1969); W. Ladejinsky, *Agrarian Reform as Unfinished Business* (1978); and Walter P. Falcon, "The Green Revolution: Second-Generation Problems," *American Journal of Agricultural Economics* (December 1978).

Radical political economists have argued that the Green Revolution's technology tends to be monopolized by large commercial farmers who have better access to new information and better financial capacity. A large profit resulting from the exclusive adoption of modern varieties of technology by large farmers stimulates them to enlarge their operational holdings by consolidating the farms of small nonadopters through purchase or tenant eviction. As a result, polarization of rural communities into large commercial farmers and landless proletariat is promoted. See Harry M. Cleaver, "The Contradictions of the Green Revolution," *American Economic Review* (May 1972); Ali M. S. Fatami, "The Green Revolution: An Appraisal," *Monthly Review* (June 1972); Keith Griffin, *The Political Economy of Agrarian Change* (1974); and Richard Grabowski, "The Implications of an Induced Innovation Model," *Economic Development and Cultural Change* (July 1979), and "Reply," *Economic Development and Cultural Change* (October 1981).

The Green Revolution is also often compared with the "Japanese model" of increases in agricultural productivity associated with the use of improved seed varieties, fertilizers, implements, and other complementary inputs within the framework of Japan's small-scale farming system. For a comparative study of Japan's experience and what has been brought about by the Green Revolution, see Kazushi Ohkawa, *Differential Structure and Agriculture—Essays on Dualistic Growth* (1972).

Experience with the Green Revolution has been mixed, with differential growth rates of agriculture in different countries or in agriculture in different regions within the same country.

This has been because of differences in the availability of inputs, extent of information, and attitude toward risks.

For an appraisal of the recent history of high-yielding cereals, see Michael Lipton with Richard Longhurst, *New Seeds and Poor People* (1989). This study examines the impact of the new varieties on the poor and claims that the increases in food supplies have had little impact on the nutrition of the poor and on their poverty.