SUSTAINABLE AGRICULTURAL DEVELOPMENT: THE ROLE OF INTERNATIONAL COOPERATION

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INTRODUCTION

Over the last decade the debates on liberalization and privatization arising from the whole process of structural adjustment in the Third World and the political transformation of Eastern Europe, and the discussions surrounding the Uruguay Round of GATT negotiations, have each called for a re-evaluation of the relative roles of the public and private sector in agriculture.

Much of this debate has been couched in dogmatic terms, based on a belief that, in many countries, the economic situation could only improve as a result of government disengagement from economic activity. Where the support of economic theory is sought, the paradigm is, explicitly or implicitly, that of neo-classical micro-economics with its emphasis on increasing competitiveness and hence efficiency. This view is reinforced by stressing government failure which highlights the problems the state faces with incentives, regulations, and absence of competitive forces leading to inefficiency, lack of dynamism and rent-seeking activities.

In the process of advancing their cause, the proponents of a reduced role for the government have in general neglected the conventional welfare economics analysis of the role of government which justifies intervention to correct for market failures arising from the existence of public goods, externalities, economies of scale and natural monopolies. Moreover, there is little reference to those ideas associated with traditional development economics, such as the role of the state in extracting a surplus from agriculture to support the development of other sectors, in developing institutions which promote growth and in achieving a socially and politically acceptable income distribution. As the neo-classical paradigm has no easy way of incorporating these concerns, they are being ignored in the current debate on the relative role of the public and private sector in agriculture.

AN INSTITUTIONAL APPROACH

In this paper, we suggest that an approach drawing on the ‘new institutional economics’ goes some way to incorporating the concerns of both these para-

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digms. This requires us to examine afresh the objectives of, and constraints facing, different types of economic agents, and to consider what constitutes and determines the set of regulations and conventions, or institutional framework, within which they operate and which governs their behaviour. This framework embraces factors ranging from the nature and definition of property rights to the accessibility and scope of the legal system for enforcing contracts. An appropriate institutional framework provides an environment which enables economic agents, both individually and collectively, to widen their range of options and creates an incentive structure which encourages efficient choices. We examine some of the characteristics of individuals, groups and the state in the next sections, as a prelude to considering the relative roles of the public and private sectors in agriculture.

PROBLEMS FACING INDIVIDUAL ECONOMIC AGENTS

One of the most basic lessons of economics is that the division of labour, specialization and exchange are essential for increasing productivity, encouraging economic growth and raising living standards. This requires cooperation between human individuals acting as economic agents but, as Binswanger and Rosenzweig (1985) remind us, this is conditioned by certain specific characteristics of human behaviour, of the economic environment and of the agricultural sector.

The human characteristics highlighted are self-interest, the value of consumption and dislike of effort, risk aversion and bounded rationality in decision making, given limited ability to collect, process and analyse information. Because acquiring information is costly, an optimizing person will stop when marginal costs and benefits are equated, resulting in imperfect and asymmetrically distributed information. This, in turn, means that the outcome of any economic activity cannot be predicted with certainty. Costly information is also a factor which impedes the universal definition of property rights and their proper enforcement. This generates a range of principal—agent problems, issues of incentives, the need for screening and monitoring, and increased transactions costs which eventually may make potential exchange uneconomic, resulting in incomplete markets. Externalities, including public or collective goods, arise from the inability to define and enforce property rights in a relatively costless manner. Indivisibilities, leading to economies of scale and the possibility of monopoly-type situations, are another characteristic of the economic environment.

Agricultural activity has its own peculiar features, which are most marked in Third World countries. One is that in many countries the sector is dominated by individuals engaged in relatively small-scale production and marketing activities. The spatial dispersion of agriculture means that transport, travel and information costs are high and time-intensive. The seasonality of production creates problems for the smooth functioning of many output and input markets. Moreover, agricultural production is notoriously susceptible to a variety of risks which can have profound effects at both micro and macro
levels, especially in low-income, agriculturally dominated economies (Hazell, 1988).

Rather than being a rarity, we believe there are elements of ‘collectiveness’ in many agricultural sector activities which make effective individual provision difficult or uneconomic. It is hard to make agricultural techniques non-excludable, particularly those which are not capital-embodied, given the highly visible nature of most agricultural activities. Spatial dispersion and small size call for shared transport networks and marketing facilities for produce collection and input distribution. There are also numerous examples of externalities where individual action may not be adequate, such as pest and disease prevention and control, food safety provisions and the maintenance of minimum quality standards. Nevertheless, individuals are sometimes willing to provide goods with collective properties, for example, where private benefits exceed total cost or where the nature of the good, or the institutional framework, can be modified to allow more of the benefits to be captured by the provider. Even so, provision will be Pareto-inefficient as long as the free-rider problem persists. Indivisibilities and increasing returns are frequently significant in organized agricultural research and in the provision of irrigation and water control facilities. These may lead to local natural monopolies if not to national ones.

It is paradoxical to find agricultural markets used so frequently as a textbook example of perfect competition. In reality, the spatial dispersion and small scale of most producers and consumers, and the extent of output and price fluctuations, mean that asymmetric information is a considerable problem. Whereas small farmers and traders encounter high opportunity costs in obtaining information (other than that relating to their own operations), the benefits are circumscribed by their small or infrequent transactions. Large producers and traders generate substantially more information or can obtain it at lower unit costs and have more opportunities to benefit from it. Institutions can evolve to cope with some information problems, for example the practice of holding periodic markets at a customary time and place, or the use of commission agents to reduce search and transactions costs. Many more remain intractable at the individual level.

Small farmers, especially in less developed countries, face particular problems from risk and incomplete markets. Faced with income instability arising from production fluctuations, macro-economic causes, political disturbances or international price instability, they are rarely in a position to use capital or credit markets to smooth out their income flows, especially when poorly specified property rights in assets such as land prevent their use as collateral. Nor are well-functioning national insurance markets available, owing to severe moral hazard and adverse selection problems resulting from imperfect information. Local insurance might overcome the information problem but is limited if weather and disease factors cause a high covariance of risks across farms. Even if futures markets were available, high transactions costs would probably preclude their use by small farmers. Low-income consumers can be profoundly affected by their inability to protect themselves from real income variations arising from food price fluctuations associated with agricultural instability. There are also considerable risks involved in marketing, both from
the physical deterioration or destruction of produce and from unpredicted changes in prices during the marketing process. There are numerous examples of actions taken by individuals on their own account, or through non-market institutional frameworks such as the extended family or the firm, to mitigate or minimize these various risk problems.

In low-income countries, the commercialization of agriculture is hindered by inadequate information and incomplete capital and credit markets. Combining this with weak infrastructure and transport links leads to market segmentation and the possibility of local oligopoly or monopoly power. Individuals may face problems financing production or marketing activities, particularly given their seasonal nature. Instability may reduce private investment in the agricultural sector. Thus commercialization and the achievement of an efficient, responsive agricultural sector requires the development of an appropriate institutional framework which will encourage collective response both at the group and state level to complement individual action.

VOLUNTARY GROUP ACTIVITIES

As suggested above, groups of individuals acting cooperatively can sometimes improve information provision, reduce or share risks, and provide not only private goods but collective goods as well. Olson's (1965) seminal work on pressure-group activity can be extended to a wide range of agricultural activities. Small groups have several organizational advantages over larger groups. Typically, they will be self-selected. This guards against adverse selection and makes it easier to achieve homogeneity of objectives and to sustain mutual trust without expensive monitoring to prevent shirking. There is little need for formal organization, and internal costs can be kept low. Nevertheless, the incentive to form a group may be hampered by the free-rider problem. This can be overcome by inducing, or coercing, potential members to join the group. In close-knit societies moral suasion and threats can succeed, but these techniques may fail as the group becomes increasingly heterogeneous.

In terms of inducement, Olson emphasizes the 'by-product' approach, where public-good provision is linked to that of a desirable private good that is best provided collectively, such as insurance, or goods where there are marked economies of size. Armah's (1989) description of wholesalers' market associations in Ghana exemplifies this approach. One major function is the arbitration of disputes among members. This is a partially non-rival collective good which should reduce the need for costly and lengthy litigation. The second function, representing members in dealing with local councils and government, that is lobbying, is Olson's classic example of group provision of a collective good. Acting as guarantors of credit is the third function. The association is well placed to provide this private good, insurance, as it can screen potential members to avoid adverse selection and advise on retailers with known bad-debt problems. The organization can also act as an information exchange on market conditions between members, which should improve the market's effectiveness unless wholesalers' associations increase information asymmetry, which raises barriers to entry.
For many types of collective goods there are potential advantages, such as economies of scale or positive externalities, in expanding the group size. But as size increases, both free-rider and leadership problems become more acute. Potential leaders are typically motivated by the direct or indirect benefits arising from this role. This leads to a major paradox in the cooperative movement as traders and politicians, rather than small farmers themselves, frequently instigate and lead these types of activities because the indirect benefits may embrace information about members or political allegiance. Whether these are the 'best' leaders to advance the interests of small farmers is debatable, especially where asymmetric information means that the general membership have little idea of the way in which their funds and resources are being used.

**THE ROLE OF THE STATE**

Where voluntary group provision of collective goods is circumscribed by leadership and free-rider problems, government intervention or provision may be the only alternative. The provision of collective goods is one of the major roles of the state, made possible by its power of legitimate coercion, which in turn is based on its comparative advantage in violence (North, 1981). To understand its other major economic role, it has to be appreciated that the state itself is composed of individuals and groups of individuals, acting separately or in coalitions to achieve their own self-interest, but constrained by the need to remain in power. To this end, resources are expropriated from the population at large, or sections of it, and redistributed to those in power, or their supporters.

The state's self-interest may be constrained by a constitution which determines the bounds of its legitimate actions, by international obligations and treaties, or by its vulnerability to being replaced. Within these constraints, however, it can formalize the institutional framework within the legal system, particularly the assignment of property rights, in its own short-term interests, and/or in such a way as to reduce the risk and costs of exchange, thus increasing economic wealth and its longer-term opportunities. This may be at as simple a level as setting a uniform system of weights and measures to be used in markets, or as complex as assigning plant breeders’ intellectual property rights.

The perceived legitimacy of the state is an important factor in determining the costs of enforcing this legal structure. For example, if urban food security is a keystone of government legitimacy, its failure to provide this may lead to civil disorder, and the state will become increasingly involved in high-cost policing to maintain its position. A state with a long time horizon will be cautious as to how far self-interest can dominate its function in securing collective advantage.

The state has a number of distinctive advantages over private agents. It has the ability to change institutions by law, rather than by developing them on the basis of voluntary consent, although it may jeopardize its popularity or legitimacy in the process. Thus it can specify land tenure arrangements, or
stipulate price bands within which commodities must be purchased or sold. It can raise funds through compulsory taxation to pay for the goods and services it provides, such as roads, or agricultural research institutes, thus removing the financial aspects of the free-rider problem at a stroke (though still leaving the decoupling of those who benefit and those who pay the cost). It has potentially a much greater spread of risk, both spatially and over a range of goods and services, than any private trader and can, in addition, change institutions in such a way as to create and transfer risk. Nevertheless, the state may still be risk-averse in many respects, being willing, for example, to pay substantial insurance premiums to achieve food security or income stability for its potential supporters.

It has, however, a significant number of disadvantages as well. The state typically comprises politicians, elected or otherwise, a bureaucracy of civil servants and officials, and a wide range of agencies and organizations to implement its policies and programmes. These often develop their own institutions and objectives, which may lead to significant principal – agent problems. It may be difficult for government to set clear objectives, implement an appropriate incentive structure, or monitor performance, each of which may result in organizational inefficiency.

The state also faces some of the problems which confront private agents, particularly in terms of imperfect information. However, it has different options as to how to deal with these. Unless it is an active participant in markets it will have to collect information explicitly and at a cost. The usual pattern of centralized information collation, followed by instructions being sent back out to the regions, is particularly problematic in agriculture, where climatic and production conditions can vary significantly over space and over time. At the same time, as many centrally planned economies have found to their cost, the state requires more information than any individual private agent, in order to regulate agricultural markets and provide the most appropriate level of public goods and services.

**ASSESSING THE RELATIVE ROLE OF THE PUBLIC AND PRIVATE SECTORS**

If we are to assess the appropriate balance between the private and public sector, and ultimately to make informed normative statements to guide policy making on this topic, we have to develop a methodology for comparing different institutional frameworks. As yet there is little theoretical work to guide this search. One way forward is to attempt to identify and measure all of the likely types and levels of costs associated with different institutional configurations. One possible four-fold categorization is transformation costs, transaction costs, risk costs and the costs of rent-seeking activities (Thomson and Smith, 1991).

Even if precise measurement is difficult, it should be possible to make qualitative estimates of the impact of major institutional changes. Providing explicit attention is paid to issues of distribution and dynamic efficiency, this approach offers several advantages over a narrow concentration on allocative
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and technical efficiency alone. It moves the focus away from an abstract view of markets, towards an approach solidly based on identifying what actually occurs in specific markets, on trying to understand the functions performed by different agents and on identifying the implications, in both cost and distributional terms, of changing the institutional configuration. As more applied work is undertaken which focuses on institutions, a pragmatic approach to policy issues, based on past experience, can be developed. \textit{Ex ante} prediction of the effects of institutional change is likely to remain difficult and imprecise, but appropriate \textit{ex post} analysis can only improve the process.

In using this approach, it is useful to appreciate that the provision of any good or service can be categorized into four functions: providing the funding, providing the good or service itself, regulating its provision, and consuming it (Ross, 1988). Each of these functions may be provided by the state or the private sector or a mixture of the two. Even where individuals cannot easily undertake some functions, for example regulation or provision of public goods, voluntary group activity, such as producer associations, may well be able to do so.

The appropriate mix of public and private activities is also likely to vary at different stages of economic development, as a more complete set of integrated markets evolves. Some of the relevant factors are the level of existing commercialization of the agricultural sector; the degree of market integration; the level of urbanization; the level of agricultural technology and sensitivity to climatic variation; the importance of food in the average budget; the importance of agriculture in the macro-economy; the pattern of income distribution; the structure of agriculture; the overall size of the public sector and the state’s revenue-raising capacity; the availability of skilled manpower and of administrative capacity; the internal cohesion of the state; the legitimacy and contestability of the state; the nature of the demand for collective goods, which will vary with income levels; and the objectives of the state.

We can use Ross’s classification, in conjunction with a cost categorization, to examine past experience of what might constitute a reasonable balance between public and private sector in agriculture, taking for illustrative purposes production and output marketing activities.

\textit{Production activities}

The evidence on institutions and agricultural production seems to indicate a clear advantage, in terms of transformation costs, for private-sector production over the public sector. Most countries which have tried to institute state production have eventually fallen foul of the problem of appropriate incentive structures. This can happen with large-scale private farming as well, but institutions have developed to counter this, both at the managerial and at the workforce levels. There seems little reason for the state to fund private agricultural production directly, given the possibility of regulating prices, subsidies, or deliveries to the state. There may, however, be a case for providing improved access to finance through state-backed credit systems and/or relaxing restrictions on the private financial sector in the hope of reducing transactions and
risk costs. State regulation also occurs in other forms, two obvious examples being restrictions on maximum farm size for income distribution reasons, or controls on crop choice or technology to counteract negative, or engender positive, externalities.

**Output marketing activities**

Given its pivotal role both in coordinating production and consumption decisions and in determining the size and distribution of the agricultural surplus, the marketing system is the area where state activity is potentially most influential. We have already indicated that exchange is vital to increasing productivity and that, even in the absence of state intervention, groups will develop institutional frameworks which reduce the transactions costs of engaging in trade. Adam Smith certainly realized that orderly markets can only exist with general acceptance of a series of rules and regulations, often legitimized by the state. Where economic development is hindered by missing and incomplete markets, this can be traced back to the absence of an appropriate institutional framework which it may be impossible to provide in the short term. In the interim, direct government action may be required. For example, where financial markets are poorly developed the government may have to provide much of the finance to mobilize the marketable agricultural surplus.

Many elements of the physical infrastructure of marketing, such as roads and market-places, have substantial public-good features which may justify government funding and/or provision. A similar argument is used to justify government funding and/or provision of information, grading schemes and so on.

Manipulating prices is a major instrument in distributing the agricultural surplus and hence in income distribution. However, governments lacking the administrative machinery to monitor the implementation of these pricing decisions may have no option but to enter the marketing system themselves. The experience of state participation in marketing is mixed. As with agricultural production activities, it is often difficult to develop a suitable incentive structure for state or parastatal marketing organizations. There are two general reasons for this. First, some commodities require rapid and risky pricing, buying and selling, or arbitrage decisions, and public-sector agencies can rarely accommodate these. Second, the use of the marketing system to achieve income distribution goals sometimes leads to a financially non-viable framework which undermines motivation. On the other hand, the provision of a secure and stable food supply in situations where international trade is difficult may require inter-year storage which may be too risky for the private sector to provide or finance and, in these circumstances, public-sector funding or provision may be essential.

**ACHIEVING AN APPROPRIATE BALANCE**

These two examples illustrate in very broad terms the issues involved. The specific costs will vary according to the institutional setting which itself
develops and changes for three major reasons: in response to changes in economic opportunities (changing relative prices and technological change); changes in the distribution of economic and political power; and changing public concerns (changes in the social welfare function). Change, or the possibility of change, may have negative effects, for example in engendering rent-seeking behaviour, shrinking productive output and reducing economic opportunity. On the positive side, it has the potential to increase productive efficiency through decreasing transactions costs. It can increase the range of types of economically viable transactions by improving information flows, reducing risk and/or reducing transactions costs. Related to this, and central to our present concern, is that it can alter the absolute or comparative advantage of different types of economic agents, such as the central government and the private sector, in performing various economic activities.

One of the paradoxes about the potential role of the state in the agriculture sector is that it has most scope for encouraging commercialization, providing information and reducing risk in low-income predominantly rural economies, where it is most likely to be weak itself, and have limited technical capacity to carry out these tasks. Conversely, the state can mobilize most funds and resources to assist the agricultural sector in situations where output and resource markets already work effectively. It is also clear that the returns to changing the relative balance between the public and private sector depend on the existing institutional framework. Where there is already an effective and active state presence, whether in marketing or research and development, the costs of building on this may be relatively low. Where state activity has been ineffective and regulation has been ignored, then the costs of developing an effective state presence will be much greater. This seems to us an area where vicious and virtuous circles abound.

CONCLUSIONS

Self-interest, including self-preservation, is the major motivating force of all economic agents, whether individuals, voluntary groups or governments. At the same time, bounded rationality, coupled with characteristics of the economic environment and agricultural production, ensures that all economic agents operate in an uncertain world with imperfect information, which imposes considerable costs on society. Economic organizations are means of reducing these costs and raising productivity, but inevitably, self-interest means that they attempt to maximize their own gains in the process.

Deciding what constitutes a reasonable balance between the public and private sectors in agriculture will always be difficult. Every institutional configuration has different distributional consequences and implications for dynamic efficiency which are difficult to predict. However, it may be possible to develop a cost-based methodology for comparing institutional frameworks which will assist this debate. What is apparent, even in the absence of empirical verification, is that there are a host of problems such as incomplete markets, asymmetric information and the ‘collectiveness’ of many agricultural
activities, which indicate a potentially wide role for governments in the funding, provision and regulation of agricultural sector activities.

In virtually all countries which have developed a successful and responsive agricultural sector the public sector has played a significant role in encouraging commercialization, in reducing risk and in developing markets and new technologies. Undoubtedly, many other countries, both capitalist and socialist, have pursued non-viable agricultural policies, requiring more resources and technical capacity than were at the state's command. Merely reducing the level of state activity is a rather negative approach. Of equal, or more importance, is the need to identify areas where the state can withdraw immediately because it is duplicating, or impeding, private-sector operations, those where sequential withdrawal may be possible, and those where increased state intervention or support is required to develop an institutional framework encouraging the sustained effective operations of the agricultural sector.

REFERENCES


DISCUSSION OPENING – JEAN MARC BOUSSARD*

It is difficult to criticize a paper which strongly emphasizes the orthodox theoretical view that state intervention is required whenever markets fail to play the role they are supposed to play (informing producers about consumer wants and enlightening consumers as to the scarcity facing producers). I find myself in total agreement with the authors and congratulate them for reminding us of the issues at this time when the formerly socialist countries, in particular, are under-estimating the shortcomings of markets and exaggerating their virtues.

However, a few comments are needed to support and supplement the excellent paper. The authors contend that costly mistakes have been made in many centrally planned economies since the state requires more information than any other agent in order to regulate markets. Actually, in such countries, many responsible people know exactly what to do to operate the economy, either on

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a Pareto basis, or at least to improve significantly its efficiency. The mistakes which have been made have often been the outcome of the decision process, which surprises everybody and is often contrary to common sense. The results have not been due to lack of information but to the way in which it has been processed.

Information-processing methods are the key characteristics of a system. Therefore, before issuing recommendations with respect to any economic system, one should examine carefully what information is processed and how it is done. The free market is one extreme method of transmitting information between producers and consumers with prices, or their equivalents, being the principal vehicles of information. Frank Hahn periodically reminds us that such an extreme cannot possibly be met in any real-world situation. Central planning is another extreme method with many defects. There are intermediate situations. None of them is intrinsically superior to another and any diagnosis must rely on careful analysis of what is occurring. This is perhaps the main defect of the paper: it does not emphasize the 'case by case' aspect of the difficulty of assessing the role of the state in agriculture.

Assume a circular farm with uniform potentiality and uniformly spread out labourers. When supervision is from the centre it can be shown that the time spent by the supervisor in travelling between the centre and labourers visited at random, and with an equal probability of selection, will grow as the power 3/2 of the surface of the circle and, therefore, of total production. This very simple example shows how management of the economy from the centre is irrational. It also explains how in market economies very large production units, whatever their institutional environment, must fail. In addition, it helps us understand such institutions as sharecropping contracts, where the beneficiary (the sharecropper) monitors himself or herself. This kind of model is very useful, since it shows us that not only state intervention, but all sorts of institution building, must be considered in the light of economic analysis of the sector.

Sometimes free market advocates may be concerned that food producers and consumers are generally not very price responsive. Thus prices give deceptive signals concerning scarcities and wants. These prices reflect short-run situations, which are different from long-run equilibria. Thus free agricultural markets are best represented by 'deterministic chaos' models with detrimental welfare implications. In such cases there is justification for intervention. In developed countries, the state then sets prices, but often does so without regard to the level of demand. Intervention in which the government buys any quantity offered at the fixed announced prices is not sustainable in the long run. If agricultural production functions are really homogeneous of the first degree it can be shown that, in the long run, production may expand indefinitely, since the marginal cost will be constant and equal to the price for any quantity. This is broadly what has happened in the European Community and the United States for grain, or in the Ivory Coast for cocoa.

It is therefore necessary to make use of all available knowledge in analytical economics for forecasting the possible implications of recommendations relating to the organization of the agricultural sector. Otherwise there will be a risk of creating problems which are more important, and more difficult to solve, than those which would otherwise exist.