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Agricultural Input Market Reforms. A Review of Selected Literature

by

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ABSTRACT

The objective of this paper is to derive lessons from selected literature concerning the impact and the conditions of successful agricultural input market reform. The agricultural inputs of interest in this review are: fertilizers, seeds, agricultural equipment, pesticides, and livestock services and health inputs. The paper examines the rationale for market reform, its impact on growth, productivity, and income of farmers, and the conditions for success. Six main conclusions emerge from this review. First, market structures are the result of evolutionary processes that accompany the adoption and the diffusion of modern technology in agriculture. Second, the development of markets and private sector cannot occur unless an adequate infrastructure is in place. Third, markets cannot work unless a favorable institutional environment is created. Fourth, the success of reforms is heavily influenced by the sequencing of various policy measures. Fifth, the participation of the private sector is dependent on the credibility of government policies in support of market reforms. Finally, the scanty evidence on the impact of market reforms on small farmers suggests that these groups are often penalized.

TABLE OF CONTENTS

1. INTRODUCTION

BACKGROUND AND RATIONALE OF REFORMS

Developing countries have a long history of extensive public intervention in agricultural marketing. Specialized public institutions are typically created to control the distribution of agricultural commodities on domestic markets, foreign agricultural trade, and, in many cases, agricultural processing and distribution of modern agricultural inputs.

Well-operating domestic markets are critical for both equity and efficiency objectives, an argument that has supported the involvement in input and output marketing in the past, but which is now used to encourage state withdrawal from the same activities. There is substantial evidence that public intervention in the marketing of agricultural inputs and outputs is often associated with inefficiencies and extensive rent seeking, leading to excessive costs of distribution, sustained suppression of producer prices and incentives, and stagnation in the agricultural sector.

The objective of this paper is to derive lessons from selected literature concerning the impact and the conditions of successful agricultural input market reform. The agricultural inputs of interest in this review are: fertilizers, seeds, agricultural equipment, pesticides, livestock services, and health inputs.

The growth of agricultural production per capita depends heavily on the use of modern inputs such as improved seeds, fertilizers, and equipment. The impressive growth of modern inputs in developing countries in the past three decades has been facilitated by

the diffusion of modern varieties in rice, wheat, and hybrid maize. In spite of their well-known contribution to productivity, the sustained growth of modern inputs could be rather difficult in the future because of mounting fiscal costs, poor infrastructure and institutions, and excessive intervention in agricultural pricing and marketing.

Even when macroeconomic biases against agriculture are removed, the functioning of marketing systems is hampered by the presence of parastatals. Public institutions are often perceived as having failed to achieve some of the objectives for which they were initially set up, namely, the promotion of smallholder farming and the development of modern technology (see World Bank 1981). Faced with soaring budgetary costs of the intervention systems, stagnating production in agriculture, rapid balance of trade deterioration, and strong pressure from the donor community, an increasing number of developing countries governments have initiated programs to reform their policies in the agricultural sector. A major component of the new reforms is to reduce public intervention and encourage participation of the private sector in the marketing of agricultural inputs and outputs.

During the last decade, a broad agreement has emerged among donors and Third World governments about the need for broad macroeconomic policy reforms. The supply response of the agricultural sector has not, however, been as forthcoming as expected. The assumption that structural change at the macroeconomic level could induce positive changes at the sectoral level rests on the assumption that markets work smoothly. The few evaluations of domestic market liberalization efforts that exist indicate that reforms are confronted with tremendous difficulties: progress is slow and the number of successful cases very limited.

The broad consensus about the need for structural changes does not extend below the macro level to the sectoral strategy of market reform. For example, market liberalization is sometimes perceived as increasing the risk exposure of small farmers to the vagaries of the market; privatization of input markets is criticized on the basis of the existence of monopolistic practices in the private sector; a sudden removal of a fertilizer subsidy is often seen as endangering the adoption of modern technology by small farmers and blocking the emergence of a large market; little attention has been paid to the public and private institutions which need to be created to effectively supply inputs to small farmers. The arguments become even more heated when one turns to the implementation aspects of reform.

SUCCESSFUL MARKET REFORM

The success of reform relies on the well functioning of existing markets; when these do not exist or are sparse, as in the case of several African countries and countries in the process of transition from a socialist to a market economy, then reform implies the creation of new markets and institutions. Even when markets are relatively developed, complex implementation issues related to the transition towards a liberalized marketing system present real challenges to policy making. Central to this transition is the appropriate sequencing of marketing reforms, including the need to develop the private sector capacity before dismantling the public marketing capacity. If liberalization measures are taken, there is no guarantee that a vibrant private sector will step in and engage in those activities previously performed by the public sector, unless adequate

resources and incentives are provided, and policy and institutional obstacles are eliminated (see Duncan and Jones 1993).

Increased efficiency and long term growth are the ultimate objectives of agricultural marketing policy reforms. However, simple and speedy elimination or reduction of state intervention does not seem to be sufficient to bring about the expected changes in the operation of local markets in many African countries. What are these expected changes and how should a reform be monitored and evaluated?

A reform will be considered successful if it leads to the development of an efficient marketing system able to accelerate and sustain agricultural growth without adverse effects on the income of small farmers. Inherent to this definition of success there are three main criteria: efficiency, effectiveness, and growth. The efficiency criterion specifies that the marketing system resulting from reform must be one in which transaction costs are lower than in the system previous to the reform. The effectiveness criterion consists in the improved access of small farmers to inputs and outlets for their outputs. The growth criterion implies the contribution of markets to growth, both through an improved allocation of resources and a creative function leading to innovations.

The success of a market reform should be evaluated in terms of observable improvements in the decided criteria. First, efficiency improvements should be reflected in lower costs of both distribution inputs and outputs. Second, the effectiveness of reform in reaching small farmers should be measured by improved access to input and output markets, higher marketed surplus, and higher income. Finally, the criterion of growth should be reflected in higher productivity, both at the agricultural sector and at the farm level.

ORGANIZATION OF THE PAPER

This paper is organized around three main questions. The first question is: Why should market reform be adopted? Chapter 2 explores the theoretical basis for markets and indicates the limitations or failures that government and market might have. The second question is: What has been the impact of market reform? Chapter 3 examines the evidence in terms of costs of distribution, growth and productivity, and differential impact on small and large farmers. The third question is: How could market reform be successful? Chapter 4 addresses several issues related to the sequencing of policies affecting input markets and related markets, price policy, and political economy. Chapter 5 gives the conclusions and indicates some research gaps.

2. THE ROLE OF THE PUBLIC AND PRIVATE SECTORS IN INPUT MARKETS

Given certain assumptions related to technology, entry, complete knowledge, rationality, and price taking behavior, a market economy is said to be perfectly competitive. This is the basic paradigm that economists refer to as a benchmark against which to evaluate alternative economic systems. Underlying this paradigm is the assumption that competitive markets allocate resources efficiently. Allocative efficiency (sometimes called Pareto-efficiency) occurs when resources are placed in their most valued uses, and no participant in the system can improve her/his welfare without making somebody else in the system worse off. The attractiveness of perfect competition derives, then, from the capacity of markets to perform an extremely complex task of the coordination of millions of decisions with no need of a central body to oversee the process. It is the idea, first expressed by Adam Smith, of a market as an "invisible hand" that leads to efficient decisions.

MARKETS AND THE GROWTH PROCESS

Through the signaling function, (i.e., the generation of temporal as well as spatial transmission of prices that reflect resource costs), markets affect the growth process by guiding the allocation of resources (allocative function) and stimulating technological innovation (creative function). The better markets work, the more accurately prices

summarize the information on market conditions, and the more efficiently this information is transmitted.

This enables market participants to learn about the real conditions of markets, leading to improved decision-making. The allocative function of markets thus corresponds to the coordination of supply and demand decisions through price signals that link economically and spatially separated producers, distributors, and consumers.

The creative function, on the other hand, is more related to generation and transmission of incentives for increased investment and innovation through the development and adoption of new, improved technologies, and the development of new products. It is mainly through the creative function that the exchange process contributes to structural transformation. In the early stages of development characterized by imperfectly linked sectors, the market process facilitates the intersectoral transfer of resources, creates additional sources of supply, and finds new groups of buyers, all of which enable the expansion of output and raises potential demand.

MARKETS AND EQUITY

Besides their efficiency impact, markets also have some implications for equity. Distribution costs (assembly, storage, transport, etc) are usually a large share of the final cost of transferring commodities from producers to consumers, which explains the importance of the performance of local markets for income distribution. Cost differentials associated with differences in access to market services and in efficiency levels between single market segments affect the absolute level of returns and expenditures among producers and consumers, respectively, based on marketed shares and demand patterns of

the individual. These locational or group-specific price differences induce corresponding resource transfers between market participants. Market imperfections often penalize poorer segments of the population through rising marketing costs and price spreads.

Furthermore, market performance affects the stability patterns of prices in local markets. Accordingly, differences in performance across space, over time, or along the marketing chains will shift the patterns of risk and uncertainty faced by participants in individual markets. To the extent that this is reflected in the level and structure of distribution costs, it will affect income distribution among market participants. In the longer run, both the cost and instability impacts of markets affect sectoral terms of trade, output expansion, and patterns of growth.

One aspect of markets that is related to equity but which is frequently ignored in market studies is its direct contribution to income generation through employment creation in the trading sector. Trading is one of the largest sectors of the informal economy in most developing countries in terms of employed labor. Moreover, the performance of markets in key sectors like the food sector can be critical to employment generated outside of the trading sector through the impact on local wage levels.

STRUCTURAL AND INSTITUTIONAL WEAKNESSES OF MARKETS

The cost of markets failing to operate effectively is apparent from the discussion above. Markets exist and operate when there is a sufficiently large number of buyers and sellers willing to carry out transactions to establish a competitive price. Accordingly, there are many reasons that can cause markets to fail in performing their signaling, response, and mobility functions. In the particular case of developing economies, market

failure is often associated with infrastructural and institutional deficiencies that significantly raise the cost and reduce the willingness to enter the exchange process.

Market failure occurs when the exchange process either does not take place, or it takes place but does not generate and transmit prices that reflect all the costs that are associated with the production or consumption of goods. In such a situation, the market process fails to produce outcomes that are economically efficient or socially equitable. In these cases, productivity and incomes can be raised through the creation of markets where none exist and by fostering the links between spatially- or temporally-separated markets (see Arndt 1988).

The preceding discussion stresses the importance of market performance for the growth process in general and for the distribution of income, particularly among poorer segments of the population. The outcome of the exchange process is determined by the performance of local markets, that is, the efficiency and effectiveness with which they operate. The latter is closely related to their infrastructural and institutional environment and their organizational structure.

The existence of market failure has provided a major *rationale* for government intervention. The idea is simply that if the market system cannot provide a sociallydesirable outcome, then the government has to intervene to lead the system toward that outcome. If excessive volatility of international commodity markets results in sub-optimal production decisions on the part of producers, then the government may set up a marketing board or other mechanisms to assume the risk itself. If the risks associated with the adoption of a new technology are high, then the government may choose to subsidize the adoption of the new technology. The idea of *government planning* within

the context of a market economy also has been developed within the same framework. Market exchange has been allowed, but "corrected" by the government through the use of price policy and various other mechanisms.

MARKET FAILURE AND GOVERNMENT FAILURE

The solution to market failure does not necessarily indicate a critical role for government intervention. Several possible market solutions to the types of market failure mentioned above can be traced in the literature. The definition of property rights, for example, may help to internalize externalities. Those who are victims of external costs may pay the sources of those costs to stop or diminish the burdensome activity (*Coase theorem).* The theory of contestable markets developed by Baumol suggests that even for a monopolist there may be incentives to behave efficiently, under the threat of possible entrants that may endanger the position of the monopolist. Moreover, market failure may appear to be a problem only in a static framework, where dynamic allocative efficiency is not taken into account. The existence of trademarks, for example, is a barrier to entry but ensures product innovation and future productivity increases.

Even when a clear-cut case of market failure is presented, it is not clear that government intervention is the solution to the problem. Government failure, itself, may be the issue. The negative experience of excessive government intervention in many developing countries would testify to this. The recent move toward market reform can, in fact, be interpreted as a response to a widely perceived failure of governments to meet the objectives of sustained agricultural growth, food security, and improvement of small farmer income.

In several countries, price stabilization schemes have been set up to assuredly protect the income of farmers from the vagaries of weather and the welfare of consumers from high prices of essential commodities. Often, however, these programs have resulted in rent-seeking activities, in expensive bureaucracies, and in little benefits accruing to the supposed beneficiaries. Price stability has been achieved sometimes at the cost of stifling production growth and the development of a private marketing system.

If both markets and government policy exhibit failures, then what is the implication for policymaking in the context of market economies? What is the *role of the state* in a market-oriented environment? We have seen that markets are efficient ways of organizing exchange under condition of perfect competition. By facilitating exchange of goods and information, they contribute to technological change and stimulate the learning and flexibility necessary for growth to occur. The role of the state is to strengthen the learning and creative functions of markets.

It is important to distinguish between situations where markets already exist, even though their functioning involves various degrees of government control, such as in most countries in Latin America and Asia, and situations where markets either do not exist, or are at a very initial stage, as is the case in many African countries and in the economies experiencing the transition from a socialist to a market economy. Even when the potential demand is very high, the effective demand for modern inputs may be constrained by economic or institutional factors. For example, the demand for improved seeds may be constrained by the non-availability of credit and extension services, or by the absence of timely delivery.

At the initial stage, when markets do not exist, public initiative may begin with market creation (Ahmed 1994). This initial period of market failure is quite different from the period when modern inputs have become reasonably well-known to farmers and market size has become adequate for a viable competitive market. At this later stage, liberalization could begin productively. Even at the initial stage of market creation, however, a gradual introduction of private trade could begin so that public marketing function never becomes pervasive.

The movement toward increasing commercialization of the seed sector has been described by Desai 1985, and Pray and Ramaswami 1991 as an evolutionary process, articulated into four stages of development. In Stage 1, no improved varieties are available and farmers generate most of their seeds. In Stage 2, improved varieties appear, as the result of agricultural research; most seeds still come from farmers, but both the public and the private sectors start distribution. In Stage 3, modern seeds spread with both the private and the public sectors involved in production and distribution. In Stage 4, most seeds are bred by modern varieties with most of the production and distribution in the hands of the private sector. Whereas the majority of developed countries are at the fourth stage, the majority of developing countries are at the first or second stage.

A similar approach can be applied to other inputs and could help to understand what reforms are appropriate at the various stages at which markets may find themselves. In reality, input marketing systems do not fit the rigid classification of the stage of the development model. However, the model still helps in pointing out the difficulty of jumping, say, from an initial stage 1 to a final stage 4. A removal of public sector involvement may be possible in countries where the input use and the technological level

are already advanced (India, China), but it may cause great stress to countries that have neither the technological basis, nor the market network that could assume the functions currently undertaken by the government. Research in the area of sequencing of reforms is still very limited and could add to our understanding of the transition process.

A taxonomy of the market functions performed in any particular subsector is useful to derive which functions could be properly implemented by the public sector and which ones could be properly implemented by the private sector (Jaffee and Srivastava 1992, and Umali, Feder, and de Haan 1992). Due to their public good nature, externalities, moral hazard problems, and economies of scale associated with delivery, certain supply functions may require some form of government intervention. The implementation of this approach requires a solid empirical basis. To say that some functions may be efficiently performed by the private sector is not equivalent to say that privatization of those functions should be promoted in a specific country. It depends on the existence of a private sector able to undertake that function. As it has been shown in the experience of some developed countries, the privatization of firms that operate in competitive markets generally increases efficiency. Privatization of sectors that operate in monopolies, however, does not necessarily improve efficiency. The challenge is to avoid the privatization which brings about the creation of a private monopoly (Vickers and Yarrow 1991).

The nature and structure of the market for an input will often dictate whether the private sector, the public sector, or a balance between the two, is most effective in efficiently supplying a given input. Evidence from both the developing and developed world shows that the seed industry is such that a careful balance between both public and private sectors is required for an effective and efficient supply of seeds. The production

and distribution of seeds is made up of a number of sub-systems which function and require different degrees of involvement by the two sectors.

Surveys of country experiences show that the degree of public involvement varies between developed and developing countries and across various sub-systems which make up the overall system of seed development and distribution. Public institutions and international research centers are involved in most of research for developing new varieties in countries at all levels of development. Basic research, germplasm enhancement, and plant breeding for self-pollinated crops still remains largely under the auspices of the public sector while the private sector is largely in R&D development of specialized crops and hybrid varieties of cross pollinated crops (Pray and Ramasawami, 1991, Jaffee and Srivastava 1992). In developed economies, variety development, seed production, and distribution falls under a mix of private and public control. In developing countries most of seed-related activity is largely undertaken by the public sector (Jaffee and Srivastava, 1992). Distribution and multiplication is mostly in the hands of public corporations while most governments also intervene to control quality, seed imports, seed prices and varieties because of the fierce competition for world markets (Pray and Ramasawami 1991).

In their review of the role of public and private sectors in the seed industry, Pray and Ramasawami (1991) argue that the balance between public and private participation depends on at which stage of development the seed industry is. The move from an initial stage where no seed industry and no improved varieties exist, to one where farmers begin to adopt varieties developed from formal research, is prompted by the government through the establishment of institutions to produce and distribute the seeds. In a later stage, the

private sector begins to be more of a source of new technology, as opportunities for private investment increase. While the public sector continues to dominate the development of open pollinated varieties in developing countries the private sector flourishes in the development of hybrid seeds (Pray and Ramasawami 1991). They conclude that seed policy must stem from farmers; however, since farmers cannot do all activities efficiently, the government must continue to provide training and equipment and monitoring the impact of infrastructure and price policies on the purchase of seeds.

Jaffee and Srivastava (1992) survey 25 countries at varied stages of development of wheat, rice, hybrid maize, and vegetables, chosen to be representative of the various types of seeds dealt with in world seed markets. Wheat, a self-pollinated crop, is expected to have only limited private sector participation, while rice is expected to have greater opportunities for the private sector. Hybrid maize is expected to have strong incentives for private investment, and with vegetables, a low volume/high value crop, private investment participation is expected to be very high, if not universal.

The survey results show that varietal development of wheat in developing countries continues to function largely under public auspices, whereas in the case of rice, farmer retention and informal arrangements dominate and do not provide incentives for improved varieties. In more developed economies, like Japan and India, private sector research has become increasingly characteristic of varietal development. The public sector also still continues to dominate in the seed processing for both wheat and rice in developing economies, as well as in retailing and marketing. For the case of hybrid maize, varietal development takes place under the auspices of both public and private activities and in some cases under joint ventures. Commercial activities for hybrids in developed

economies are handled completely by the private sector, in developing economies it varies from the coexistence of public and private cooperatives to being entirely private or entirely public. Most, if not all, vegetable seeds are under the auspices of private activity in both developed or developing economies (Jaffee and Srivastava 1992).

Using a similar approach, Umali et al. (1992) identify the nature of livestock services and the role of public and private sectors. Livestock services are broken down into two types of services: health services, including curative and prevention services; and production services, such as research and extension, improved livestock husbandry, and the provision of seeds, feeds, and artificial insemination.

The authors measure the provision of livestock by estimating the number of veterinary livestock units (VLUs) per veterinarian and per veterinary auxiliary. They also measure the rate of participation of private veterinarians by looking at the number of government to private veterinarians in each country. In Europe, North America, Oceania, and most of Central and South America and Asia, the private sector plays a dominant role. In most of Africa (except South Africa and Zimbabwe) and the Middle East, services are provided by the public sector, even though the private sector has become increasingly involved since the latter part of the 1980s (Umali et al. 1992).

The degree of public sector participation depends also on the various components within veterinarian services. Veterinarians' surveillance is predominantly a public activity. Extension in North America, Western Europe, Australia and the Philippines is an integral component of private sectors, whereas in Africa, Asia, and Latin America it continues to be within the public sector. Veterinarian research was found to be undertaken by both the public and the private sectors. Clinical care is exclusively private

in Uruguay, Australia, New Zealand, North America, and Western Europe, whereas in the rest of the world the public sector continues to be significantly involved (Umali et al. 1992).

Vaccinations are private goods, but involve externalities and require public support to ensure sufficient investment in these services. In African and Asian countries, these are almost exclusively provided by the government. In Brazil, Argentina, Morocco, and West Europe, they are partially subcontracted to the private sector. In Canada, the US, Chile, and Uruguay, the private sector or farmers themselves provide this service. Vector control (tick and tse-tse) involves extensive externalities and, therefore, the public sector is largely involved worldwide. Vaccines are mostly produced by government research laboratories, and so is semen and artificial insemination in Africa and Asia. In highly developed countries, this is an integral part of livestock herd management which is provided mostly by the private sector. Finally, the production of veterinarian drugs is highly privatized throughout the world (Umali et al. 1992).

The authors also report that opportunities for private sector entry exist only in the production, marketing, and distribution of veterinary drugs. High levels of subsidation of other services or the free provision of these services pose strong disincentives to the private sector. Based on the results of their survey, the authors conclude that privatization policies in livestock services should be adopted selectively because of the variation in the nature of the economic environment in each of its components. Privatization undertaken as a broad strategy could be detrimental to the provision of these services (Umali et al. 1992).

A review of government interventions by Knudsen et al. (1990) concluded that, particularly in the developing world, government involvement has mostly had profound disruptive effects by indirectly taxing farmers and subsidizing consumers. Government attempts to control prices have often reduced farmers' incentive for production, while increasing incentives for consumption in urban centers. The attempts to offset these distortions, through subsidies on fertilizer and credit and public investment in the infrastructure, have primarily benefitted large farmers, encouraged environmental degradation, and discouraged the employment of rural labor. Government parastatals, particularly in Africa, have distorted incentives, resulting in inefficient management and soaring budget deficits.

An analysis of input delivery systems shows that they consist of a set of individual links which are part of a larger integrated system (Mittendorf 1987). Governments have often become involved in almost all aspects of this integrated system because of their concern with regional development and equity issues. Historically, there has been a strong feeling that the free market has not performed well enough in this area since private marketing agents either charge too high prices, or are not innovative enough. Furthermore, in Africa, because of the fragmented nature of delivery services and hence higher operating costs, there has been an added incentive for government participation. Such involvement by the government in inputs markets requires timely and detailed forward planning and the coordination of the logistics and the vertical components of the system. Country experiences have made it increasingly noticeable that the dynamic, innovative, and cost saving features found in private enterprises can be beneficial if applied to public input delivery systems (Mittendorf 1987).

Stiglitz (1987) argues that in choosing a set of agricultural policies for a given country it is important to identify the reasons for market failure and then apply the appropriate instruments to remedy it. To blindly exclude or include government intervention from all activity would be unwise and possibly counterproductive. He argues that there are five conditions under which government intervention in agriculture can be justified. First, incomplete markets in insurance, futures, and credit in most developing countries may require some intervention for insuring farmers. Second, the existence of public goods not likely to be supplied by private agents suggests a role for public sector. Third, imperfect information may require extensions services so that farmers' adoption of new technology is facilitated. Fourth, externalities resulting from the use of new technology by one farmer which conveys information to other farmers imply a rationale for public support of modern technology in the initial stage of technology diffusion. Finally, the need to correct for inequities between small and larger farmers implies a redistributive role of the state.

Subsidies affect the decisions of farmers to allocate their efforts and resources (either output or input taxes), and these are likely to have distortionary effects. The combination of output taxes and input subsidies to offset the distortionary effects can be costly and inefficient. But it is not because of these distortionary effects that they should be automatically discarded as a possible component of agricultural polices. In cases where the adoption of new technology is low, subsidies could be justified (see Stiglitz 1994) on the basis of imperfect risk markets.

3. IMPACT OF REFORMS

The impact of input markets reforms will be assessed by looking at how they affect the costs of distribution and production, economic growth and productivity, and access to inputs by small farmers. In many underdeveloped countries, particularly in Africa, the highly underdeveloped infrastructure imposes extra costs for distributing goods. Subsidies or parastatals often covered many of these costs and were designed to ensure the delivery of inputs even to remote areas. The elimination of public expenditure on such activities often has been accompanied by disincentives for participation by the private sector to take over the functions previously undertaken by the public sector. This has regressive effects on the proliferation of information and knowledge on agricultural inputs, often leading to either an immediate or gradual decline in the use of agricultural inputs and, eventually, on productivity.

Reforms have been found to include a decline in the access to financial services previously provided by public sources. The proliferation of local commercial credit markets is hampered by the inherent riskiness due to default and lack of collateral. The immediate impact of reforms, through the elimination of single channel input supply systems, the phasing out of government schemes, and the increase in commercial interest rates has left farmers dependent on either informal sources of finance or savings for investing in inputs (FAO 1994). This, in turn, has resulted in an increase in farmers' costs

and over time it might have decreased the chances of technological adoption. Such impacts could make reform efforts counterproductive to their original goal of increasing productivity.

COSTS OF DISTRIBUTION/PRODUCTION

The increase in costs is often translated in an increase of the input price immediately following reforms. The literature presents evidence in various input markets in which prices were not only seen to increase following reforms, but private agents have been unable to emerge due to lack of incentives and a shrinking input use by farmers.

For the case of fertilizer, Jebuni and Seini (1992) show that the removal of subsidies in Ghana led to increases in the price of inputs and a reduction in their sales. From 1985 to 1990 subsidies were almost completely eliminated. Price trends show that the real price of compound fertilizer increased by 29 percent per annum from 1980 to 1990 and that of sulphate of ammonia by 27 percent per annum. These increases are attributed to the continuous depreciation of currency and also the policy of phasing out agricultural subsidies on fertilizer and other inputs. This led to the accumulation of inventories; in subsequent years (1991) no imports were ordered, creating inflexibility and, hence, greater costs when it came time to meeting sudden increases in demand. The increase in input costs led to a decline in the distribution to remote areas considered less commercially viable. The parastatal, still operating after reforms and encouraged to function more efficiently, operates at one-third of its former capacity since it no longer distributes where it is not economically sound to do so.

Similarly, Shepherd (1989) finds that a number of factors related to the price of fertilizer have implications for the cost of distribution. Factors including increases in the price of fertilizer resulting from the removal of subsidies, the selective application of subsidies, panterritorial pricing, government controlled prices and margins, and the use of prices for political reasons, all curtail incentives for the private sector participation through the increase in costs. These factors potentially create undesirable conditions for the successful implementation of privatization schemes.

Despite the increased use of fertilizer by farmers in developing countries, Knudsen er al. (1994) remain highly critical of fertilizer subsidies because of the high costs involved. They argue that lower prices for inputs offered to farmers are just part of a paternalistic attitude suggesting that farmers are not smart enough to realize the benefits of using fertilizer themselves and need to be encouraged by subsidies. Subsidies have ranged from 0.4 to 1 percent of GDP in some countries and have added some inflationary pressure. At the micro level, the lower price has led to the overuse of inputs. Micro-inefficiency is magnified at the macro level, since subsidies are often run by inefficient parastatals. Furthermore, uniform pricing across locations and seasons regardless of costs has encouraged use in non-economic areas and seasons. Productivity has been negatively affected because of the tendency for parastatals to vary the type of fertilizer or the choice of crop subsidized. Finally, the private sector was not given a fair chance to compete with the public sector.

Although focusing on output markets, Jones's (1994) review of maize marketing reforms in Kenya, Malawi, and Zimbabwe finds that some efficiency gains have been achieved through parastatal marketing activities. Reforms aimed at cutting costs run the

risk of curtailing the achievement of desirable non-commercial goals. Establishing a financial framework which adequately balances its role in controlling costs, while continuing to provide the non-commercial activities that the marketing boards once provided, continues to be a difficult endeavor. Despite several years of reform, positive impact on both consumers and producers seems to be limited. Consumers have been observed to bear the costs in situations where producers have passed on the costs in an attempt to lower their own costs. However, some of these increases in costs have been balanced off by access to lower costs in marketing channels. There has been an observed increase in the response of private traders to market opportunities, but only in the case of spatial arbitrage. Little, if any, involvement by private traders in seasonal or interannual storage for delivery at future dates was found to occur (Jones 1994).

ECONOMIC GROWTH/PRODUCTIVITY

In Bangladesh, where reforms are considered to be on the whole successful, Ahmed (1994) assessed the impact of liberalization policies by looking at changes in agricultural production due to changes in the levels of input adoption and use. It is expected that liberalization improves economic growth directly through input use, and indirectly through an increase in both agricultural and nonagricultural inputs due to a cut in subsidies. Economic growth is measured by an increase in production (in this case, rice, which accounts for more than 73 percent of crop GDP). It was found that reforms contributed about 35 percent of the increase in production via a 75 percent increase in fertilizer use, and a 35 percent increase in irrigated area.

Although his analysis does not address the effects of input market reforms per se, Chembezi (1993) provides some empirical evidence on the effect that price changes have on fertilizer use and output supply, which, in return, have an impact on economic growth. This study is based on annual data compiled during the years 1966 to 1988, from Malawi. Unlike previous studies conducted in other developing countries, this study finds that fertilizer demand is very quick to respond to price changes. Conventional wisdom on the speed of fertilizer adoption is that farmers with more experience in using fertilizer are likely to respond more quickly to fluctuations in prices. In Malawi, where the level of use is quite low, an alternative explanation is adopted for the relatively quick response to price changes. The author argues that since fertilizer use in Malawi is very low and far away from its ceiling in effectiveness, there is still a lot of room for large marginal increases, hence, the strong response to changes in price levels by farmers.

The effects of fertilizer price on use of fertilizer are also found to be stronger than the effects of product price. Furthermore, supply response analysis shows that outputs of maize and tobacco respond very little to changes in fertilizer prices. The author cautions that this result should be considered carefully, since it is highly reliant on the methodology used to estimate supply response which is limited in that it must exclude numerous possible factors which affect demand (Chembezi 1993). One can at least conclude that relative prices of fertilizer, maize and tobacco are in fact important in the input/output decisions. The effect of fertilizer price on output supply, although marginal, cannot be ignored and provides some empirical evidence on the effect of price changes of fertilizer use on output supply.

Ratna and Desphande (1992) analyze the impact of the removal of input subsidies (specifically, fertilizer) in India and find that in all areas, irrelevant of the level of subsidization and productivity, given the increase in prices caused by the removal of subsidies, 94 percent of users indicated a "slight to high" reduction in input intensity. Furthermore, 97 percent of those surveyed responded with a reduction in productivity from "slight to high" and 91 percent responded with a reduction in technological adoption.

Evidence from Indonesia shows that the use of subsidies and pricing policies to encourage the adoption of inputs has induced fertilizer application practices which are both technically and economically inefficient. Over-use of fertilizer is a major concern because of the high budgetary costs they incur, as well as concern over environmental conditions, and because of the questionable impact the use of chemicals can have future food crop sector (Roche 1994). In his analysis of fertilizer practices in ten provinces of Indonesia, Roche (1994) reports that application rates are reportedly above agronomic recommendations and economic criteria. He does caution that his estimations do not account for concerns rural farmers have about relying on that land for providing the basic staple food supply, and there is real concern for wanting to increase yields for this purpose.

Technical efficiency of fertilizer practices is evaluated by looking at how several factors fare according to standards for soil nutrient removal and rates recommended by regional extension agencies. Fertilizer practices in the region show that yields vary less than fertilizer use, so that higher use in certain areas resulted in only a smaller proportional increase in yields. These results support that significant losses are associated with current fertilizer practices in Indonesia (Roche 1994). Economic efficiency is assessed by estimating a Cobb Douglas production function in each of the 13 provinces in the area.

These estimates show that net farm income would be higher if fertilizer use was reduced (Roche 1994). The study concludes that policies should be oriented towards lowering fertilizer use by allowing fertilizer prices to increase, since in Indonesia there is little need for subsidies to encourage the adoption of yield increasing technology.

The scenario where excessive use of fertilizer in developing countries can have negative effects on both economic and technical efficiency was encountered only in some regions of Asia. In Africa, Lele et al. (1989) conclude that, despite subsidies, fertilizer use in general has remained low, mostly due to the lack of infrastructure and high transaction costs.

The effect that reforms can have on growth does not depend solely on the use of fertilizers, but also on reallocation of production factors (Duncan and Jones 1993). Duncan and Jones (1993) argue that the evidence that reforms are actually stimulating growth is emerging in sub-Saharan Africa, but still is very scanty. Economic growth depends not only on a prompt supply response to a set of market determined prices, but also on the reallocation of production factors and on factor productivity improvement. Hence, supply responses to prices are not sufficient indicators of the impact on economic growth.

Market structure and performance play an important role in promoting positive impact on economic growth. Many studies have shown that the issue of private or public ownership is not the determining factor for the performance of enterprises. It is the degree of competition and regulation within their operating environment which plays a more important role. Therefore, newly privatized enterprises will not thrive simply because of the transfer of ownership. A well-functioning system of incentives is needed within the

framework of a competitive environment. Kikeri, Nellis and Shirley (1994) review the process of privatization in already established market economies and the factors that lead newly privatized enterprises to succeed. They argue that the problems with maintaining poorly performing state-owned enterprises are not only in low returns, but also in slowing the growth of the private sector. Capital-intensive state-owned enterprises block entry by private firms and hence create monopolies by crowding private firms out of credit markets. Economic growth becomes limited to the expansion and advancements of monopolizing state-owned enterprises, which, in many situations, are found to function inefficiently.

Galal et al. (1994) do not show evidence which demonstrates economic growth as an outcome of privatization, but, in eleven out of twelve divestitures analyzed, they show evidence of an improved economic environment. In most cases, productivity rose, workers that were laid off received large severance packages, and prices fell. However, such positive results from privatization are said to be more likely to occur in wealthier countries than in less developed countries.

The individual country experiences with institutional changes in agriculture reviewed by Thompson (1991) do not show strong evidence of improvement in economic performance in the period following reforms. Performance depends on whether traders are confident that governments will maintain liberalization policies and the function and role of government-run marketing boards are clearly defined so that the private sector is not crowded out. Access to new channels of credit facilitate the participation of the private sector in agricultural markets, while the maintenance of subsidies and price fixing can provide serious impediments to this process (Thompson 1991).

SMALL FARMERS

One of the measures of the impact is to assess the effectiveness of market reform to reach small holding farmers and the quality of the products provided. In her study of the impact of economic reforms on the seed sector, Cromwell (1992) pays close attention to the level and quality of seed services provided to small commercial farmers. She argues that the overall effect of reforms has increased neither incentives nor the ability for small farmers to use improved seed. In addition it is debatable whether there has been any internal efficiency improvements in these institutions. Not only has access to seeds not improved, but overall economic reforms have increased operating cost in the seed industry. Companies have been allowed to pass this increase in costs as increased seed prices, but because of partial liberalization, staple grain prices have not been decontrolled and hence farmers' returns to improved seed use has fallen.

Small farmers did not benefit from reforms either because reforms were not tailored to the smaller farmers, or because they failed to account for the macro-micro linkages between smaller farmers and the rest of the economy. Reforms should be coupled with policies which address the needs of smaller scale farmers and are compatible with their mode of operation (Cromwell 1992). Duncan and Jones (1993) also suggest that the promotion of small holder farmers requires a framework of resources to aid farmers' rise onto higher productivity planes and sustain and build on it over time. Reforms must be more targeted towards their needs. Evidence also suggests that services to smaller farmers are not well-designed because they are not a politically powerful constituency (Chambers 1983).

A study by Lele, Christiansen, and Kadiresan (1989) reports that there was a greater diffusion of fertilizer among small farmers in MADIA countries following the implementation of development projects funded by outside donors in the 1970s than in the period following reforms in the 1980s. There is no evidence of increased fertilizer use as a direct result of reforms; however, there is some evidence that use did rise as reforms were institutionalized. The increases in use observed following reforms could have been made possible by factors such as the liberalization of imports, increased private participation in the distribution process, setting margins to more accurately reflect costs, and packaging fertilizer in smaller quantities for small farmers, as was seen in Kenya.

These increases in use and diffusion were largely limited to larger farmers and generally did not reach smaller farmers. In Cameroon, liberalization policies have led to efficiency gains but the benefits to smaller subsistence farmers from these gains have been very limited. In Malawi, it was deemed necessary to maintain certain subsidies following reforms for the purposes of ensuring access to fertilizer markets by small farmers. In Senegal, factors such as climate, lack of fertilizer supply, and absence of credit in combination with drastic reductions of subsidies to reduce public sector deficits resulted in extreme reduction in fertilizer consumption throughout the farming regions.

Supply constraints in all of the MADIA countries that have limited diffusion consist of shortages of foreign exchange and weaknesses in domestic procurement and distribution network. The collapse of internal distribution networks due to unpredictable government policies and unstable institutions that donors condoned and facilitated was a major supply constraint. Demand constraints also increased as fertilizer subsidies were removed. As fertilizer subsidies are removed, increased investment in agricultural

research, small scale irrigation, transportation and credit is needed to replace the benefits previously in place because of the subsidies. In some of the countries surveyed, because of the high costs of implementing such programs, subsidies are arguably the better alternative. In light of this, the authors conclude that there still exists a role for both public and private sectors. The private sector functions most effectively in areas where demand potential and transportation infrastructure are already established. In areas where demand remains to be established and are characterized by low income farmers with no access to credit, the public sector still needs to be involved in facilitating fertilizer use and adoption (Lele, Chirstiansen and Kadiresan 1989).

Other studies that look at the effects of reforms in the fertilizer industry show that reforms have not improved the effectiveness of markets in reaching small farmers. Jebuni and Seini (1992) argue that reforms in Ghana have increased the concentration of the distribution of fertilizer networks in urban areas, resulting in the inability of the market to provide for small farmers located in remote areas. Since the proportion of farmers using fertilizer is small, it is expected that the distributional impact of reforms will also be small; observable regional disparities are, however, likely to persist.

The removal of subsidies is most likely to affect the poorest farmers in the savannah zone, who are reported as being the main users of fertilizers (rice, tomatoes, sorghum/millet and maize farmers). Evidence from expenditure quartiles and probit analysis indicates that there is no reason to believe that fertilizer use is skewed in favor of the rich. The difference between fertilizer use in the lower quartiles and the higher quartiles is insignificant. On the other hand, insecticide use is more concentrated (more than double) among the highest quartile. Distributional tables also show that fertilizer use

is higher among small farmers than larger farmers. Nonetheless, the probit analysis on the use of fertilizer shows that both household expenditure per capita and farm size are insignificant in explaining the likelihood that a household will use fertilizer. In the case of insecticide use, however, both expenditure per capita and farm size and assets are all positive and statistically significant (Jebuni and Seini 1992).

The equity issue concerning the response of large and small-scale farmers is influenced by how functional input supply systems are, not by size. Byerlee (1993) argues that small-scale farmers are as likely to adopt the same technology as larger-scale farmers with only a short lag. Hence, low adoption in small-scale farmers has said to be the result of poorly functioning input-supply systems. Case studies and evidence suggests that the elimination of subsidies and reforms are, therefore, likely to affect smaller-scale farmers because of the lower level of infrastructure and resources available to them (Byerlee 1993, Booth 1991).

4. CONDITIONS FOR SUCCESS

Although there is no golden rule which guarantees success in all countries, the literature offers some lessons to be learned from past experience. Some studies conclude that success of reforms is dependent on careful planning and involvement of government before and after reforms are instituted (Ahmed 1994, Cromwell 1992, Shepherd 1989). Others conclude that although government still plays an important role, its involvement is most helpful when it is limited (Kikeri, Nellis and Shirley 1994).

This chapter will focus on four main aspects related to liberalization. First, the extent of liberalization is examined. Second, the issue of sequencing of reforms is taken up; third, the pricing and market conditions; fourth, political economy and credibility of reform will be addressed briefly.

PARTIAL VERSUS FULL LIBERALIZATION

Partial liberalization is often resorted to because of the high costs of full liberalization and the sudden shock effect the latter may have on the economy. Governments tend to liberalize at one end of the spectrum of input markets, but not at the other end. There have been examples of countries that open up trade with other countries while still maintaining a centralized system of distribution controlled by parastatals. Such partial liberalization can strain the overall economy even if it is expected to improve in the

long run. Inefficient distribution of the inputs by parastatals create bottlenecks in the distribution of inputs leading to market failures and undermining reforms.

When dealing with the removal of subsidies, it is not always advisable to remove all subsidies at once. In some cases, subsidies were instituted to improve the use and access of inputs. Governments may opt to keep some subsidies to ensure that the costs of reforms are minimized. Shepherd (1989) cautions that, although the gradual reduction of subsidies may at times be necessary, governments should ensure that there is universal access to existing subsidies. Partial subsidization of fertilizer allocated to some regions has been seen to create a hostile environment for entrepreneurs trying to compete with parastatals. In some cases fertilizer brought in as foreign aid and available at zero cost undermined the marketization process (Pinstrup-Andersen 1992).

The slow adoption of seed fertilizer technology in Africa, unlike Asia, has induced several observers to support partial rather than full liberalization. According to this view, sub-Saharan Africa lacks the appropriate institutional environment and infrastructure required to induce the adoption of seed-fertilizer technology. There is generally poor access to inputs and lack of stable price incentives and input prices (fertilizer) in Africa are generally higher because of high transportation costs. Most of the subsidies, which were once in place to compensate for the high costs, were phased out during the 1980s. These problems add significantly to the risks of adopting fertilizer. Byerlee (1993) suggests that increased investment in infrastructure can in the long run reduce such problems; in the short-run, however, governments may have to engage in price stabilization policies, input distribution, and subsidies in order to encourage the adoption of technology and inputs.

The FAO (1994) reports that there is sufficient evidence from the country studies that suggests that subsidies and price controls can seriously hinder development of the private sector when maintained after the implementation of liberalization measures. Practices such as the maintenance of buffer stocks at prices below the import parity price in Ghana, the large proportion of purchased inputs supplied by aid projects, NGOs providing credit to village cooperatives and associations at more favorable terms than commercial banks in Mali, and implicit subsidies on fertilizer imported by state-owned companies, are examples of hindrance to the development of the private sector. Governments must weigh the costs and benefits of not providing such protection. The decision must be made whether it is worth distorting markets in the short-run for the benefit of establishing a private sector which will function effectively over the long-run (FAO 1994).

Government involvement via parastatals is said to be inherently political, as they are designed to redistribute income from one group to another (Knudsen et al. 1990). The problem with this is that there are no guarantees that the political goals are such that income will be fairly distributed. To truly reform such a system would require the "abolition of monopoly power, exposure to competition, removal of government subsidies (including the underwriting of commercial loans), and insulation from political pressures, as well as making managers accountable and giving them incentives to operate efficiently and turn a profit." In this case it is argued that full liberalization is required in order for reforms to be successfully implemented since maintaining government intervention would only hamper the development of equitably functioning markets.

Many of the country experiences reviewed show that for reasons ranging from food security to political interests, government-run marketing boards and parastatals are often

left to function alongside with private traders, and for some time during the period of liberalization. This is not necessarily a call for concern that reforms will be unsuccessful. These agencies can continue to function at a reduced level of operations, becoming more transparent and more accountable, and by taking on functions to aid private agents in their entry into input markets (Thompson 1991).

SEQUENCING

Sequencing of reforms has had differential effects in countries which have already instituted reforms. Agriculture is dependent on other sectors and institutions to function adequately. These range from regulatory boards to financial institutions to finance new investments. Input markets are particularly dependent on other institutions because of the initial costs farmers must accrue when producing a certain crop. It is not uncommon to find situations in developing countries where farmers do not make use of an input because of lack of credit due to inadequate supply of financial services, lack of supply of a needed input because of trade restrictions, and highly volatile prices. The success of reforms in input markets will therefore depend on the existence of services and institutions which facilitate the transition. Duncan and Jones (1993) argue that the lessons on sequencing of reforms from their survey of marketing reforms show clearly the need to develop the private sector through provision of resources and incentives, before removing completely public sector marketing capacity. Furthermore, reforms supported by adequate research, reforms in infrastructure and financial sector, and pricing reforms are more likely to yield successful results.

The reform process in Latin America, Eastern Europe and Africa has highlighted the paramount importance of the financial sector. Given the risk involved in agrarian markets, the lack of sound financial institutions and conditions for sustaining investment and efficiently allocating rents in order to provide incentives for private investors has proven to be detrimental to reforms. Using productivity of physical capital as a measure of economic growth, McKinnon (1995), in his review of the evidence on the impact of the financial factors on growth, shows that economies characterized by stable price levels and real exchange rates along with open capital markets and moderate interest rates were most conducive to growth.

In the case of reforms in input markets the lack of sound financial policies will undoubtedly be a serious obstacle to the goals of sectoral privatization and liberalization policies. At the macro level, McKinnon (1995) suggests a sequencing of financial policies which should begin with balancing government finances. This includes moderating government expenditures and broadening low rate taxes on households and enterprises. This is of particular importance where parastatals are eliminated since this eliminates a significant portion of government income crucial during reforms for financing support schemes.

After the stabilization of fiscal expenditures and revenue, McKinnon (1995) suggests that the opening up of domestic capital markets should follow to assure that borrowers and lenders are faced with real interest rates which better reflect the true cost of transactions, taking inflation into account. This includes deregulation of banking systems where they exist, which in some cases requires a gradual elimination of government involvement in order to avoid "bank panics and financial breakdowns." Finally, having

successfully instituted well-functioning domestic capital markets, the final step in reforming financial sectors is the liberalization of foreign exchanges.

From evidence of reforms in Bangladesh, Ahmed (1994) concludes that the success of reforms is dependent on substantial public intervention prior to the existence of markets, including the political will of government to maintain reforms. Critical to the success is the sequencing of reforms such as the introduction of competitive trading at the retail market level first, followed by privatization of the wholesale and international trade level, and accompanied by a gradual expansion of geographical coverage. Complementary informational support to the government in monitoring price changes, and measures to mitigate credit constraints of the private sector accelerate the transition from a government controlled to a private marketing system.

Kydd and Spooner (1990) and Smith and Spooner (1989) make some recommendations for successfully sequencing reforms. Typically, the implementation of reforms is characterized by the following sequencing: (i) removal of restrictions on domestic marketing; (ii) removal of price controls; (iii) reduction of marketing subsidies and parastatal subvention requirements; and (iv) reduction of restrictions on external trade. However, such sequencing can be problematic if the public sector continues to be involved in pricing reform. Duncan and Jones (1993) suggest it would be better to proceed with the removal of marketing controls and the reduction of the risk of destabilizing the marketing system (Duncan and Jones 1993).

In the case of agriculture, Duncan and Jones (1993) recommend the process espoused by Smith and Spooner (1989) and consisting of the following steps: (i) move towards market-determined prices and begin marketing reform and institutional

improvements, (ii) initiate measures to promote the private sector, (iii) remove restrictions on private marketing, (iv) reduce the role of government through divesture, contracting out, and closing inefficient organizations. For economy-wide adjustment programs: (i) relaxing controls on imports of critical agricultural inputs, (ii) devaluing to reach and maintain a competitive exchange rate, (iii) undertaking priority infrastructure rehabilitation, (iv) initiating reforms to domestic financial, labor and land markets, (v) undertaking agricultural liberalization, and (vi) undertaking external trade liberalization. This is designed to ensure that appropriate incentives are in place and that resources are available and priced at scarcity value to enable agriculture sector to respond to reforms (Duncan and Jones 1993, Smith and Spooner 1989).

Cromwell (1992) presents evidence of sequencing of reforms and a macroeconomic environment which fail to improve the security of the majority of small scale semi-commercial farmers. The recommendations found in her study arise out of the experiences in the seed industry; however, they are easily generalized to other input markets. She argues that the success of reforms is enhanced by the presence of institutional support accompanying legislative changes. The lack of a vibrant private sector waiting to take on the formerly public sector can be problematic. Careful planning and implementation of reforms are therefore crucial for success. In successfully implemented privatization schemes, market conditions should induce private participation. Many countries undergoing reforms did not have markets which functioned adequately prior to reforms. Therefore, the role of incentives in the post-reform period become even more critical for the success.

Kikeri, Nellis and Shirley (1994), based on their review of privatization in market economies also argue that, in the absence of incentives, privatization schemes are less likely to succeed. Sequencing still continues to be an issue in countries undergoing privatization. Although the authors do not espouse a universal strategy, country evidence suggests that commencing with the privatization of smaller firms already operating in more competitive environments is a better approach since they don't require prior restructuring, are less politically risky, are easily absorbed by local private enterprise and enhance the overall market system in preparation of privatization of larger state owned enterprises. Evidence also shows that the selling of small and medium sized enterprises does not require much prior restructuring and should be done quickly through competitive bidding. But the selling of large SOE requires careful preparation and planning, including the establishment of laws and institutions to support the newly privatized entities. Such a strategy would create a less strained environment with well functioning markets to support larger privatization schemes.

In many developing countries where reforms are taking place, there are few well-functioning markets, if any at all. However, it seems plausible that the privatization of smaller firms would prepare the environment for the privatization of larger firms. FAO (1994) suggests that the response to reforms by the private sector is more rapid where appropriate market conditions exist such as an already functioning private sector, a suitable environment for small-scale entrepreneurs, access to credit services, potential profits sufficient to attract entrants, high seasonal demand, access to foreign exchange, national security, and a policy framework favorable to private participation.

In the case of Tanzania, Booth (1991) reports that the sequencing and timing of components in Tanzania's structural adjustment programs were the factors most instrumental in shaping their outcome and impact. As a normal part of structural adjustment programs, the local currency was devalued. Businesses and farmers were forced to bear the increase in costs from devaluation, and, in addition to this, in the domestic markets they continued to be faced with price control, non-competitive marketing arrangements, and bureaucratic obstacles which prevented them from making the necessary adjustments (Booth 1991, FAO 1994). Fertilizer subsidies were not removed, but, because of devaluation, the cost of inputs increased nonetheless and small-holders as a whole were reportedly using less fertilizer. Larger farm-holders were able to benefit from devaluation because they were more able to diversify their crops to those that yielded a more profitable input to output price ratio. The transportation sector also was kept highly regulated and providers of transportation services were prevented from passing the increase in costs of inputs to consumers.

Country experiences in Africa show that progressive ad hoc liberalization is highly inefficient (FAO 1994, Thompson 1991). It may be necessary to maintain certain systems which will allow farmers to get capital for investment. Determining how much public involvement to maintain after the inception of structural adjustment programs can be tricky and depends on the trade-off between the private and the public sectors. The case studies show that input supply tends to be monopolized in the period after structural adjustment programs (incidences of single company dominance observed in Ghana, Mali, and Tanzania). However, after structural adjustment programs some parastatals have

been reported to function more efficiently and single-channel systems that remain perform better than the privatized systems (FAO 1994).

In general, the experience in Africa shows that reforms have largely been on an ad hoc basis. Only in Ghana was a relatively well-researched package of reforms instituted. Evidence from the FAO (1994) study supports Smith and Spooner's (1990) argument that domestic financial markets must be liberalized before produce markets. Financial reforms and demand management instituted simultaneously have proven to be problematic for the development of the private sector because of reduced availability of credit and bank lending to higher risk and high cost rural areas. Only larger traders have been able to rely on commercial banks for financin, while smaller traders have had to rely more on informal borrowing and profits for investing in trade. The authors report a broad consensus on the issue that markets for inputs and products should be liberalized prior to the removal of government involvement; since government intervention may be needed at least in the early stages. However, it is important not to fall into a situation where government is simply providing a service already provided more efficiently by the private sector.

Thompson (1991) discusses the pros and cons of reforms taking place on a crop-by-crop rather than on a function-by-function basis. The problem with the crop-by-crop approach is that it may induce switches from one crop to another where government support is still maintained, compromising the success of the overall reform process. In the case of a function-by-function approach, a sequencing of reforms moving from the consumer level to the producer level is suggested. Output markets should be liberalized before input markets in order to smooth the problems that small farmers may face in procuring inputs from private channels (FAO 1994). The importance of liberalizing

output markets before input markets is also stressed by the rapid response in the fertilizer sector in Egypt, when market reforms were implemented (Goletti 1994).

Based on Ghana's experience, Bumb et. al (1994) stress the point that the simultaneous introduction of exchange rate liberalization and subsidy removal programs does not promote growth in fertilizer use nor does it encourage private sector participation. Proper sequencing and phasing should be developed for each policy, and, if needed, some safety nets should be provided to counteract the undesirable effects of some policies.

PRICING AND MARKET CONDITIONS

Kikeri Nellis and Shirley (1994) strongly suggest that valuation and pricing in the context of privatization schemes are best carried out and sustained when they are established by markets and least successful when governments are involved in setting prices that may be overvaluing or setting unrealistic expectations. In the interest of sustaining political support, governments often are reluctant to let go of control over assets, particularly to foreign investors or wealthy minorities. Government ownership of major state owned enterprises gives an illusion of an equitable system which helps to maintain political stability. However, the authors argue that particularly in developing countries this can hamper the process of privatization by precluding possible sources for financing it.

In order to avoid the development of a problematic financial environment the authors offer a set of suggestions. They argue that sales for cash are better than accepting debt. Newly privatized firms heavily indebted to the government often fail. They cite the example of Chile between 1974-1984 where privatized firms financed through public debt to government collapsed in the face of the recession in the early 1980s. They suggest

debt equity swaps where the "debtholder who wants to buy the enterprise exchanges debt worth a fraction of its face value in the secondary market for equity" provide incentives for private investors.

Panterritorial pricing is said to inhibit the proliferation of privatization. For many years the distribution and marketing of inputs has been under the control of governments concerned with reaching distant areas and pleasing political constituencies. In such a centralized system it is simpler to charge one price across a country or region for the input, regardless of the location and the costs involved in the supply of the input. This is not a very efficient way of pricing inputs and leads to distortions which eliminate profit incentives for private agents to participate in input markets (Pinstrup-Andersen 1993, Shepherd 1989). Panterritorial pricing forces consumers and producers close to consumption or shipment centers to subsidize those further off. It is arguable that subsidies used to support panterritorial pricing would be better invested in infrastructure development. In some cases, panterritorial pricing has led to segmented markets; in some other cases, it has driven the private sector completely out of many agricultural markets (Knudsen et al. 1990).

In cases where price controls are needed, they should be limited to regional centers. Traders who service distant villages should be left to charge economic prices so that there are sufficient incentives for private firms to supply inputs. Where prices continue to be controlled, frequent revisions as well as close scrutinization of the marketing costs are required while maintaining close contact between private and government sectors (Shepherd 1989). Liberalization often is a more efficient alternative than panterritorial

pricing. This is particularly so in cases of border areas, where trade with neighboring countries may be an effective way to lower marketing costs (FAO 1994).

In his review of the proliferation of Turkish Threshers in Egypt, Kerr (1994) lists a number of factors which, although specific to this industry, were obviously the main reasons for the lack of success of domestic small scale producers. Contracting arrangements were limited so that firms were responsible for the entire process of producing the threshers. Some small firms lacked the large equipment necessary for the production of certain parts and, therefore, they contracted out their work to the larger firms.

The development of the thresher industry was hindered by supply shortages of critical inputs. Lack of access to skilled labor and imported parts needed for the production of the threshers impinged on the quality of threshers that could be produced. The pool of skilled labor was limited, since higher paying neighboring countries lured better skilled workers, and imported parts were unaccessible because of import licenses difficult to obtain.

Financing for the business was also an impediment, due to a lack of viable financial services. Credit was made available, although at very high rates which most farmers were not willing to pay. Furthermore, in order to qualify for credit, firms were required to register as officially licensed workshops, which they were unwilling to do because of the complications that arose out of the erratic and troublesome nature of the tax collection system. Hence, although credit was easily available out of programs sponsored by IFAD and USAID, most firms did not qualify for it.

POLITICAL ECONOMY AND CREDIBILITY

At the global level, market liberalizing philosophies have been adopted by a great number of countries at all levels of development. In the Eighties, Britain, France, the United States, and Canada instituted several privatization schemes to enhance productivity and efficiency of previously publicly owned organizations. In developing countries throughout Latin America, Asia and Africa, privatization and market liberalization schemes have also been adopted in the hope of increasing national growth and development. The degree of political and economic reforms and the degree with which these are adopted varies from country to country. Central stage in this global transformation has been Eastern Europe where both political and economic reforms have been adopted in a relatively short period of time.

Experiences in the countries mentioned above have shown that success depends on the degree to which reforms are socialized into the political and economic spheres (Whitehead 1993a and 1993b). Simple adoption of liberalizing reform policies imposed by outside pressure to reform can be expected to fail. Few generalizations and conclusions can be made concerning which political, social and economic structure will work best for a given country. However, Whitehead (1993b) argues that at least four issues can be expected to arise in most countries undergoing reforms.

First, reforms instituted during periods of "fiscal crisis," such as those commonly experienced in Latin America, can be expected to be more challenged, as the result of a reduced ability to govern and implement stringent policies. Second, a certain degree of stability in both political and economic expectations is necessary for the purpose of minimizing the amount of speculative expectations being formed. Third, it is vital to establish reliable transparent and accountable legal systems for instilling confidence and

credibility in the reforms adopted. Lastly, the degree of international support of domestic liberalization initiatives may facilitate the success of the reforms adopted.

Evidence from the African experience with structural adjustment and institutional reforms in agricultural policies shows that the most important element to liberalization polices is government commitment to the policies and carry them out thoroughly (Thompson 1991). This supports Whitehead's generalizations outlined above of the need for stable expectations and transparent and accountable institutions in economies undergoing transformation to market economies.

In addition to this, institutional reforms are likely to be more successful when planned and implemented in the context of an assessment of the existing marketing system and not according to a prototype of how it should function. All objectives must be clearly spelled out. Governments may opt for not privatizing marketing boards but instead to improve on the efficiency in the marketing system itself by reforming setting performance targets, increasing autonomy and instituting clear channels of financial accountability. Such plans and goals must be clearly identified and expressed (Thompson 1991).

If privatization is the route chosen, it is important that the government actively promote policies which facilitate private participation. Governments can enhance the success of liberalization by actively promoting information on the private sector, by removing unnecessary legal restrictions, such as restrictions on transactions and licensing, removing imperfections in capital markets (access to credit), alleviating transportation costs, and providing access to foreign exchange. Profits to entice private sector

participation can be improved by removing strict price controls and allowing for some stabilization such that it is compatible with the private sector goals (Thompson 1991).

Credibility of government is a crucial factor for the success of reforms. Unpredictable government policies and unstable institutions discourage private investment (Pinstrup-Andersen 1992). Duncan and Jones (1993) also argue that a major determinant of success is whether policy makers institute reforms by starting with a clearly thought out model for a new marketing and pricing system, and a coherent credible strategy for implementing reforms.

In the case of Egypt, the refusal to implement highly needed reform policies and the tardiness in following through after having begun the process proved to have aggravated the Egyptian economy during a time when it was already experiencing extreme economic hardships. It became clear that Egypt needed to liberalize and privatize parts of its economy in order to deal with the extreme pressures put on demand for food, shelter, jobs, and commodities stemming out of a fast-growing labour force as a result of small baby boom in the early 1970s, the repatriation of Egyptians following the gulf crisis and a relatively fast growing population. Reforms were stalled into the 1990s, however, despite the great need to stimulate the economy. Price controls and consumer subsidies created obstacles for the development of a more viable economy. The government refused to follow up on price liberalization, public sector reform, and privatization, because of fear of a public revolt and because powerful vested interests (government officials, public patronage, private sector making large rents from contracting with public sector had no interest in slimming down the public sector) in maintaining the status quo (Richards 1991).

5. CONCLUSIONS AND RESEARCH GAPS

The promise of market reform to be a panacea for solving the problems of low agricultural growth, inefficient public enterprises, and development of a dynamic private sector still remains to be fulfilled. The evidence on the performance of agricultural sector in those countries where market reforms have been introduced, either as part of structural adjustment programmes or as the result of sectoral policy, is rather mixed. The particular case of agricultural inputs associated with modern technology, namely fertilizers, seeds, chemicals, equipment, and livestock health inputs and services, is interesting because it represents an important test for the validity of many assumptions regarding market reform as a viable strategy for development. The selected review of the literature in the preceding chapters points to six major conclusions regarding the impact and the conditions for successful reform of agricultural input markets

First, market structures cannot be created from a vacuum. They are the results of *evolutionary processes* that accompany the adoption and the diffusion of modern technology in agriculture. Unless modern technology is known to farmers, its advantages are perceived as sustainable, and resources are available, a demand for modern input is not going to occur. That implies that in the initial stages of adoption of modern technology the role of private markets is rather limited. That is because information is often not available, advantages are not sustainable, and resources are limited in the early stages of

technology adoption. The experience of most developing countries, and in particular, of those countries that have been successful in the adoption of modern varieties, confirms that the major driving force behind the Green Revolution was not represented by market forces, but by the cooperation of international organizations and national government institutions. As the process of development unfolds, the market expands. Information, demand, and supply grow and make several public institutions obsolete and interventionist policies ineffective and costly. The role of government changes and needs to redefine itself. The regulatory role becomes more important whereas the active intervention in the supply of inputs becomes marginal.

Second, the development of markets and private sector cannot occur unless an *adequate infrastructure* is in place. The most immediate consequence of a poorly developed transport infrastructure is given by high transportation costs that make the emergence and growth of demand for modern inputs difficult. But infrastructure does not mean only roads, railways, and ports. Rural infrastructure, such as irrigation and drainage systems, health facilities, and schools, are largely public goods that make possible the operation of markets. When these infrastructural conditions are not given, market reform is often destined to failure. The short term attempt at subsidizing the use of modern technology is not sustainable unless, at the same time, long term investment in physical and social infrastructure is undertaken.

Third, markets cannot work if, besides an adequate infrastructure, a f*avorable institutional environment* is created. Markets are, among other things, mechanisms of exchange based on contracts. Unless a legal system is provided that can protect the interests of parties involved in a contract, the development of the market system is going to

be limited. Both domestic and international trade is based on the assumption that contracts are enforced. When the enforcement of contracts is arbitrary or does not exist, the scope for development is seriously limited. In addition to the legal environment, a financial system that meets the credit requirement of the marketing system is necessary for the development of the private sector. That involves the development of financial institutions able to mobilize savings and provide financing to the private sector. Moreover, the extension of modern technology requires public sector support, especially in the early stages of intensification. The combination of private and public roles is, however, possible from the beginning. Finally, a modern marketing system needs agents able to access, understand, and diffuse relevant information. The role of information systems and training then becomes vital for the development of markets.

Fourth, the success of reforms is heavily affected by the *sequencing* of various measures. The matter is complicated by the absence of good theoretical frameworks to identify the best path of action. If a certain system has to move to a desirable state, there are various paths that can be followed. The literature on the subject has indicated a preference for a gradual approach to reform, whereby output markets are liberalized before input markets, and exchange rate devaluations are not introduced at the same time as withdrawal of subsidies. A reduced presence of parastatals could still be a situation preferable to an abrupt elimination of government intervention.

Fifth, the appropriate sequencing and timing of reforms still could encounter the scepticism of the private sector, unless government policies in support of market reform are credible and there is *commitment* to agricultural growth. That commitment is often

measured not only by the support of producer prices, but, even more importantly, by long-term investments in agricultural research, extension, and rural infrastructure.

Sixth, the scanty evidence on the impact of market reforms on small farmers suggests that these groups are often penalized. Even though these reforms have long-term benefits, *safety nets for the poor* should be provided during the reform process. Since small holding farmers often constitute the majority of the farming population, their income growth is critical to the success of reform. Further evidence on this issue should therefore be accumulated in order to provide information useful to improve the design and implementation of reforms.

The previous chapters have reported selected research contributions to the issue of agricultural input market reforms. As the process of structural changes evolves in many developing countries and as the market approach gains more support among policy makers around the world, experiences of performance and problems are accumulating. There are, however, still several gaps that research should fill in the coming years in order to arrive at a better overall evaluation of the experience with market reform.

Two gaps will be indicated here as deserving particular attention. First, there is the effect of market reforms on marginal areas, and more generally on different agro-climatic regions. This issue may be very relevant as it is perceived that low-potential areas are left out by market reforms. As comparative advantage is exploited in high-potential areas, there is the suspicion that low-potential areas have only migration as the main solution to their development. This problem is at the intersection between the literature on agricultural linkages and the literature on market reforms. One hypothesis is that agricultural growth in high-potential areas leads to rural non-farm growth in

low-potential areas in a sustainable way. To explore under which conditions that is a viable development strategy is a worthwhile research program.

The second gap has to do with the environmental impact of market reforms on the environment. There is a concern among some environmental groups that the free play of market forces will not take into consideration externalities and sustainability issues. Health hazards that may result from unscrupulous traders in chemicals, or pests coming from low quality seeds appearing in markets with lax registration legislation are often cited as examples. The evidence, however, is still very scanty. There are cases where the abolition of subsidies on fertilizers and pesticides has been beneficial to the environment. A lot of work needs to be done to see if market reforms may improve the performance of the current system in many developing countries.

Table 1. Selected Literature by Country and Input.

INPUT / LOCATION	FERTILIZER	SEEDS	PESTICIDES/ OTHER CHEMICALS	AGRIC. EQUIP-MENT	VETERINARY SERVICES/ LIVESTOCK HEALTH INPUTS	ALL INPUTS	OUTPUTS
Global		Pray & Ramasawami 1991 Jaffee & Srivastava 1992			Umali et al 1992	McKinnon 1995 Whitehead 1993a,b Knudsen et al. 1990 Mittendrof 1987 Stiglitz 1987	
Africa	Sheperd 1989	Pinstrup-Andersen 1992				Thompson 1991	
MADIA (Malawi, Kenya, Tanzania, Cameroon, Nigeria and Senegal)	Lele et al. 1989						
Sub-Saharan Africa	Byerlee 1993	Byerlee 1993				FAO 1994 World Bank 1981	
- Egypt	Goletti 1994	Goletti 1994		Kerr, 1994		Richards 1991 Goletti 1994	
Western Africa							Duncan and Jones, 1993
- Cameroon							
- Ghana	Jebuni & Seini, 1992 B. Bumb et al. 1994		Jebuni & Seini, 1992				
- Nigeria							
- Senegal							
Eastern and Southern Africa							
- Kenya							Jones, 1994
- Malawi	Chembezi, 1993	Cromwell, 1992					Jones, 1994
- Tanzania						Booth 1991	
- Zambia	Jha & Hojjatti, 1993	Cromwell, 1992					
- Zimbabwe		Cromwell, 1992					Jones, 1994
Asia							
- Bangladesh	Ahmed, 1994	Ahmed, 1994	Ahmed, 1994	Ahmed, 1994			
- India	Ratna and Desphande						

	1992						
- Indonesia	Roche 1994						

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