

Reforming the Government's Role in Pakistan's Agriculture Sector

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This paper assesses the role of the government in Pakistan's agriculture sector and concludes that major reforms are needed. The government's role is grouped into two main areas: price and trade policy, and public institutions, services, and expenditures. First, the paper assesses the impact of the price and trade policy on incentives and the functioning of input markets. Agricultural incentives have been severely distorted by policy, both through direct effects on agricultural prices and indirect effects operating through the exchange rate. Although indirect effects from the exchange rate have been corrected, some indirect effects remain because of higher protection given to industry. Subsidies on the input side have created distortions in input markets, dissipating much of the subsidy and its intended benefit to small farmers. Second, the paper looks at the role of public institutions. These have proliferated into almost every area of agriculture, with very little benefit to the sector. The most notable failure has been in the area of research and extension. Public enterprises have crowded out the private sector in marketing and distribution, and the rationale for government presence in these areas is not clear. Hidden expenditure also has taken place through underpricing of water and electricity, making the continued provision of these inputs financially unsustainable. The paper concludes that the role of government in agriculture has had little beneficial impact for most farmers and, therefore, major reforms are needed in policy and institutions to help sectoral growth.

INTRODUCTION

In Pakistan, as in many other countries, the government's role in agriculture has been extensive. The Government of Pakistan seems to have defined "public goods" and market failure quite loosely, and, until recently, the public sector role has been increasing. The public expenditure programme and public institutions are the major instruments through which public policies regarding agriculture are implemented. All these factors combined as such—public policy, the public expenditure programme, and public enterprises—determine the nature and extent of the government's role in agriculture.

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This article reviews the government's role in agriculture to assess whether it has helped or hurt agriculture. The article has four parts. First, it briefly outlines the major policy objectives of the government in agriculture. It then looks at how price, trade, and other government policies (such as macroeconomic policies) affect the sector. The paper then looks at the size, composition, and efficiency of public expenditures. This section also examines how public enterprises have performed, and whether they have promoted or hindered the growth of agriculture. Finally, it outlines what changes in government policies are needed for an improvement in the performance of the sector.

POLICY OBJECTIVES IN AGRICULTURE

The government has certain explicit policy goals for the agriculture sector. In addition, the government influences sectoral performance with policies aimed at the other sectors, or at the economy as whole. Sector-specific policies include agricultural pricing and marketing policies, while economy-wide policies include trade and commercial policy.

The key elements of the agriculture policy goals include obtaining a high agriculture growth rate (exceeding the population growth rate), increasing productivity of the sector, pursuing an export-oriented strategy, conserving and developing the natural resources, promoting institutional development, bringing social and economic equity to the agrarian structure, and focusing on small farmers and rain-fed area development.

It is difficult to judge policy from such broad objectives. Problems may arise since multiple objectives can lead to conflicting policies. For example, the goal of high agricultural growth is often combined with the goal of food security. Maintaining a low flour price is a policy that the government pursues to ensure food security, but the government also wants to promote domestic wheat production—leaving the government with a difficult balancing act. If a set of non-conflicting objectives could be constructed, there is still the matter of implementation. Supporting small farmers is an example of a stated objective that is often not realised. It is, therefore, essential to focus on the actual implementation of government policy (and not just the stated objectives) and, with respect to the incentives, to look at the total policy regime—both sector-specific and economy-wide.

PRICE AND TRADE POLICIES AND THEIR IMPACT

In Pakistan all major crops are covered by guaranteed minimum price or support price programmes. The setting of the guaranteed minimum price, in theory, is a consultative process that takes into account many factors, including domestic and world demand and supply, cost of production, prices of competing crops, and

intersectoral considerations. The programme is designed to combat price drops immediately following harvest, which could force farmers with limited storage to sell at depressed prices.

The designated agencies must purchase all quantities offered to them at the guaranteed minimum price, if the market price falls below this level.¹ Funding these purchases is often problematic and the parastatals have a poor financial record (see below). There is anecdotal evidence that parastatals also collude with processors or traders to share the gains from monopolistic market positions.

Distortions in direct marketing and taxing arrangements continue for some crops, notably wheat. For wheat, the government maintains the wholesale farm price below the international price through subsidised imports. Complicated regulations regarding the export of cotton have existed over the years, but liberalisation is now underway. Until recently, anyone could export cotton, but it was subject to a (daily-adjusted) minimum export price, below which no exports could take place. In addition, a benchmark minimum export price was set, and a variable export duty was levied on the gap between the minimum export price and the benchmark price. The variable duty was imposed when international cotton prices rose (as they have recently) to keep cotton in Pakistan for the domestic textile industry. However, the government has now allowed a much greater proportion of the rise in cotton prices to be passed on to farmers. Like many other countries, Pakistan uses price policy to support domestic sugar growing, but rice is now completely liberalised.

Economy-wide policies also have an important effect on agricultural incentives. Tariffs and quantitative restrictions that protect other sectors affect the equilibrium real exchange rate. In addition, industry protection adversely affects the price of traded agricultural goods compared to other traded goods—an effect that operates in addition to the real exchange rate effect. The real exchange rate can be compared with the equilibrium real exchange rate in the absence of trade regime distortions,² and, by this measure, the estimated influence of trade policy on the exchange rate in the past has been large (Table 1). However, this is a partial

¹Provincial food departments and the Pakistan Agricultural Storage and Services Corporation (PASSCO) procure wheat at the support price announced by the government. The government still procures between one-quarter and one-third of the total crop. Both the state Cotton Export Corporation and private exporters handle the export of cotton. Private sector traders dominate the domestic trade in cotton. An export duty is imposed to guarantee that raw cotton is available to textile mills but the government has now made the export regime more beneficial for farmers, causing a shake-out in the textile industry. The Rice Export Corporation of Pakistan carries out the procurement, storage, quality control, and export of rice. Rice procurement has been voluntary since 1986. Sugarcane owners sell their produce to the mills at pre-determined support prices.

²Dorosh and Valdes (1990) compare different methods of estimating the impact on the exchange rate of trade policy. Another approach to estimating the discrimination against agriculture is adopted by Gulati and Pursell (1993) for India. This involves a direct comparison of the levels of protection in agriculture and industry. We use this approach later in this section.

approach that only takes account of one of the many influences on the real exchange rate.³

Table 1

<i>Annual Average Overvaluation due to Trade Policy Distortions (Percent)</i>	
Period	Overvaluation
1972-75	25
1976-79	28
1980-83	25
1984-87	21

Source: Hamid, Nabi, and Nasim (1990), Table 3.2.

We assess the effect of policy on agricultural incentives by comparing domestic prices with parity prices (world prices, adjusted for transport costs to domestic locations). Indicators of protection and revenue transfers are constructed in the usual fashion. The nominal rate of protection is the percentage by which the producer price differs from the parity price. The transfer into or out of agriculture is the difference between the value-added in agriculture at actual prices and the value-added at parity prices, adjusted for non-price transfers such as subsidies, investment, and taxation. Note that measured protection can change either because the policy changed or the international prices changed without any countervailing change in policy. Thus, the measures should be interpreted as showing the extent to which the price regime caused a divergence between the domestic and parity prices during a particular period; however, changes in measured protection do not necessarily indicate policy changes.

The parity price is the import price for a commodity that is normally import-

³Since most agricultural commodities are traded goods, the level of the exchange rate is an important determinant of agricultural incentives. However, there are many influences on the exchange rate. Distortions in the foreign exchange market can be accounted for by comparing the actual exchange rate with a purchasing power parity (PPP) rate, or by looking at the black market premium. As Pakistan has liberalised its foreign exchange market on the current account, the divergence between the actual exchange rate and the PPP exchange rate (or the black market premium) has become less important in recent years. However, convertibility on the capital account is still restricted, and some divergence between the PPP rate and the actual rate remains.

Most measures of the effect of the trade regime are based on the ratio of the price of traded goods to non-traded goods in the presence and absence of trade distortions; trade policy is but one influence on the exchange rate. Other factors could lead to the rupee being undervalued, or not overvalued. Most notably, if restrictions on capital flows were to be relaxed, the rupee may appreciate. Furthermore, the continued depreciation of the rupee and the ongoing trade reform have made the trade regime effects much less important in recent years.

ed, and it is the export price for a commodity that is normally exported. Since Pakistan has high internal transport costs, the difference between the import and the export parity prices is quite large. For sugar, cotton, and rice, this does not pose a problem because the trade status of these commodities is stable over time. However, wheat is a marginal case, and is generally classified as importable because it has been imported in recent years. However, Pakistan could well achieve domestic market equilibrium in wheat below the import parity price, and it is the market equilibrium price that is the appropriate parity price in this case [Byerlee and Morris (1993)]. Estimates of protection so adjusted will show lower disprotection than the standard calculations.

Let us first consider the effect of policy distortions on output prices (Table 2). Historically, agricultural producers have faced large disincentives. The only major change in the mid-1980s from the historical pattern was a significant fall in the protection for sugar, and more modest falls in the disprotection for cotton and *irri* rice. Large nominal disprotection persisted for wheat. More recently, there is some protection for coarse rice. Steep rates of disprotection remain for cotton and wheat, and sugarcane remains highly protected.

Table 2

The Effect of Interventions on Agricultural Prices Nominal Rates of Protection at Official and Free Trade Exchange Rates

Crop	1960-87	1984-87	1991-92	1992-93
<i>Basmati</i> (Rice)	-38 (-60)	-59 (-69)	-49 (-54)	17 (2)
Cotton	-19 (-46)	-14 (-36)	-48 (-54)	-18 (-29)
<i>Irri</i> (Rice)	-29 (-51)	-13 (-35)	-22 (-30)	30 (14)
Sugarcane	24 (39)	10 (-18)	70 (53)	56 (37)
Wheat	-10 (-42)	-30 (-48)	-31 (-39)	-35 (-43)

Sources: Hamid, Nabi, and Nasim (1990), (Table 5.2) for 1960-87 and 1984-87; Longmire and Debord (1993), (Table 9) for 1991-92; and Shabbir (1994) for 1992-93. Before 1992-93, we show protection at both the official exchange rate and the free-trade adjusted exchange rate (in parentheses). The 1991-92 estimates are trend values and the locations are Gujranwala (wheat and *basmati*), Multan (cotton), Faisalabad (sugarcane), and Larkana (*irri*).

Taking Account of Input Prices

The government recognised that depressing the price of agricultural output could have adverse incentive effects, so an extensive system of input subsidies was

put in place. As the Green Revolution progressed, the key inputs to modern agriculture (irrigation water and fertiliser) became heavily subsidised. Electricity and pesticides also were subsidised. In the early 1980s, the pesticide subsidy was removed, and the fertiliser subsidy was reduced. There is still a subsidy on diesel, electric tubewells, and the purchase of seed. A variety of subsidised credit schemes exist and, to the extent that agriculture uses imported inputs, these schemes have benefited from exchange rate overvaluation.

It is convenient to distinguish inputs by the question as to whether they are traded or non-traded. The measures of nominal protection of outputs above can be adjusted to take account of the fact that the price and trade policy will make tradable inputs cheaper, or more expensive, than their free trade prices. The effective rate of protection takes this into account.⁴ Tradable inputs include fertiliser, pesticides, and tractors. Since Pakistan has now eliminated subsidies on most tradable inputs, the rates of effective protection do not differ that much from the rates of nominal protection (Table 3). The subsidy effect of traded inputs is minuscule.

Table 3

Nominal and Effective Rates of Protection, 1991-92
Trend Values (Percentage)

Item, Location	NRP	ERP
Wheat, Gujranwala	-39	-46
<i>Basmati</i> (Rice), Gujranwala	-54	-59
Coarse Rice, Larkana	-30	-39
Sugarcane, Faisalabad	53	70
Cotton, Multan	-54	-63

Source: Longmire and Debord (1993), Table 11.

Note: These measures were constructed using free trade exchange rates.

More important is the role of non-traded inputs. The combined effects of output and input pricing on incentives can be summarised by the producer subsidy equivalent, which measures the subsidy to, or from, producers resulting from the output and input price policy (Tables 4 and 5). To highlight the role of non-traded inputs in Pakistan, Table 4 presents the producer subsidy equivalents and the effective rates of protection side by side. Important measured subsidies on non-traded

⁴It shows how the value-added by Pakistani farmers at current farm prices (the value of tradable outputs minus the value of tradable inputs) compares with the value-added at social (parity) prices. The tradable inputs considered included fertiliser, agrochemicals, fuel, machinery, seed, and concentrate feed. In 1991-92, both nitrogen and phosphate fertilisers were about 30 percent cheaper at domestic prices than world prices. Agrochemicals and fuel were about 10 percent more expensive.

inputs include the lack of complete recovery of operations and maintenance costs on the irrigation system, and interest rate subsidies on loans.

Table 4

*Effective Rates of Protection and Producer Subsidy
Equivalents for Major Crops, 1991-92 Trend Values (Percent)*

Product	ERP	PSE
Wheat, Gujranwala	-46	-15
<i>Basmati</i> (Rice), Gujranwala	-59	-33
<i>Irri</i> (Rice), Larkana	-39	-10
Cotton, Multan	-63	-40
Sugarcane, Faisalabad	70	92

Source: Longmire and Debord (1993), (Table 16).

Note: These measures were constructed using the free trade exchange rate.

While PSEs and ERPs are not directly comparable, their respective orders of magnitude can be used to indicate relative subsidy effects. As Pakistan has slowly liberalised its agriculture sector, levels of disprotection for export crops have fallen significantly in recent years. Sugarcane, however, remains highly protected.

Two significant omissions from the PSE calculations are the capital costs of the irrigation system, or defaults on loans. Both represent uncounted subsidies, and so the stated figures tend to overstate the adverse incentive effects. However, some argue that the capital costs of the irrigation system were recovered before the mid-1970s, when the revenue from farmers exceeded current costs, and that consequently there is no need to allocate the capital costs of the system.

Taking all transfers into account significantly reduces the extent of price distortions. So much so, say Longmire and Debord (1993), that net disprotection of agriculture was close to zero during 1991-92. This, however, ignores serious distortions and intersectoral policy bias (see below) not captured in subsidy calculations. While an aggregate estimate may show small discrimination against agriculture, overall efficiency in resource allocation is impaired because of significant disprotection for some crops and strong protection for others. The disprotection for wheat and cotton induced a transfer of resources away from those crops and towards sugarcane, which was and is highly protected.

Moreover, even as price distortions have fallen, the efficacy of the price and subsidy regime remains in question. Simply using subsidies as compensation for reduced prices omits the crucial question of whether the subsidies are going to the intended recipients. Evidence suggests that subsidies are not helping farmers, especially small farmers. While canal water may command a price one-fifth of its social

price, who benefits from this subsidy? While water is supposed to be equally distributed, bribes and rent-seeking determine the distribution of water rights [World Bank (1994)]. Public procurement has similar abuses. Anecdotal evidence suggests that procurement agents exploit farmers by absorbing most of the difference between the market price and the support price when the support price regime is in effect. Thus, intermediaries and not farmers absorb the rents in the system.

Policy Bias against Agriculture:

Comparison with Other Countries

Given the similarity between agricultural policies in Pakistan and India, useful insights can be gained from looking at the Indian incentive structure. According to Gulati and Pursell (1993), at official exchange rates, Indian agriculture had an effective protection coefficient of 0.86 between 1980-81 and 1986-87, while in 1986-87 manufacturing's effective protection coefficient was 1.34. If we take into account non-traded inputs, disprotection of agriculture will be reduced to nearly zero, but the protection of manufacturing relative to agriculture is indicative of a substantial bias against agriculture within the traded goods sector, with consequent misallocation of resources.

According to a recent World Bank report, Pakistan has also protected industry relative to agriculture (Table 5), at least as revealed by the import tax rates. Import tax rates are far lower on agricultural imports than on other kinds of imports.

Table 5

*Trade-weighted Mean All-inclusive
Import Tax Rates, 1989-90*

Sector	Rate
Whole Economy	70.1
Agriculture	46.7
Manufacturing	73.8
Consumer Goods	92.4
Intermediate Goods	71.8
Capital Goods	65.5

Source: World Bank (1992).

Of course, import tax rates are imposed rates and actual collection rates may be less; in addition, the protection may be latent since some goods may still be produced cheaper domestically than at the world price. However, other indicators also point to substantial protection for industry. The three main industrial sectors are chemicals,

engineering, and textiles, which receive average effective protection of 24 percent. In addition, the dispersion in rates of protection is huge. Within the three industrial sectors, 70 percent of domestic resources are employed in inefficient and highly protected industries. This diversion of resources to inefficient sectors (and to rent seeking) comes at the expense of unprotected sectors, including agriculture.

Over a broader range of countries, the effect on agriculture of protection for other sectors (tradable and non-tradable) has been relatively high in Pakistan. The effect of trade policy can be quantified by the impact the policy has had on nominal rates of protection for agriculture (Table 6). The total effect can be disaggregated into direct and indirect effects. Direct effects measure the percentage by which the producer prices diverged from free trade prices (given the actual exchange rate and the degree of industrial protection). Indirect effects take account of the impact of trade and macroeconomic policies on the real exchange rate, and the extent of protection afforded to non-agricultural tradable commodities.

A comparison of the impact of policy in Chile and Pakistan is instructive. Direct effects had small impact on agricultural incentives in both Chile and Pakistan. However, indirect policy had the effect of reducing the price received by Pakistani cotton farmers by 35 percent relative to the world price, while producers of Chile's primary export crop (grapes) were losing only 7 percent of the world price for the same reason. So even when measures of incentives within agriculture show protection close to zero, disincentive to agriculture can arise from protection given to the other sectors (that is, from indirect effects).

Table 6

Direct, Indirect, and Total Nominal Rates of Protection for Exported Products, 1980-84 (Percent)

Country	Product	Direct	Indirect	Total
Pakistan	Cotton	-7	-35	-42
Chile	Grapes	0	-7	-7
Malaysia	Rubber	-18	-10	-28
Egypt	Cotton	-22	-14	-36

Source: Krueger, Schiff and Valdes (1988).

Pakistan also emerges unfavourably from a comparison with the high-performing East Asian economies, which had generally low levels of disprotection of agriculture. Korea, Malaysia, and Thailand had substantially lower disprotection of agriculture (in Korea, agriculture was protected). Thailand's disprotection of agri-

culture was similar to Pakistan's in the 1960s, but the two countries subsequently diverged sharply.

POLICY ON TAXING AGRICULTURAL INCOME

Agricultural income has traditionally not been taxed, and the political economy of agricultural taxation has held that agricultural income and wealth should not be taxed because the transfer out of agriculture resulting from incentive policies is so large.⁵ As analysed in the previous section, there were significant revenue transfers from agriculture in the past, although these transfers did not accrue to the government. In recent years, the transfers due to price and trade policies have decreased, and if one takes into account all the transfers into agriculture—such as credit, water, and electricity subsidies—there may be very little transfer out of agriculture. Haque (1993) estimates the net transfer out of agriculture at between 5 and 8 percent of agricultural GDP.

However, even if one accepts this transfer as an alternative to explicit taxation, keeping output prices lower than parity prices and offsetting this with input subsidies is an inequitable and inefficient way of raising revenue from agriculture. The output-depressing effect of such policy can be even more serious than is captured by the price differential between the domestic and the import priority price. Most important, under such a system, much of the transfer out of agriculture does not accrue to the government, but is dissipated as rents. Examples of rent dissipation include corruption in water distribution and excess capacity in the textile and flour milling sectors. Clearly, revenue from agriculture could be generated in a far more efficient fashion while pursuing other worthwhile goals. Progressive direct taxes could raise revenue in an efficient manner while facilitating the pursuit of equity. A land tax could raise revenue and increase the incentive to use land as efficiently as possible.

It should be noted here that the sectoral classification of tax burden (direct or indirect) is perhaps not the most appropriate way of looking at the tax burden; it is more appropriate to assess tax burden by income level. However, comparing agriculture with other sectors is still important from the point of view of political economy of tax reform. Nevertheless, the guiding principle of tax policy should surely be that agricultural income should be taxed in the same manner as the income from any other source.

Tax Reform Proposals

The interim government of 1993 introduced reforms in the agricultural

⁵In the political economy view, negative rates of protection and negative producer subsidy equivalents are seen as "taxes" on the agriculture sector.

income and wealth tax that were largely endorsed by the Task Force on Agriculture, which submitted its report in February 1994. The new income tax is in reality a presumptive tax based on the productive capacity of land, assessed in terms of produce index units (PIUs). The tax rate will be Rs 2 per PIU between 4,000 and 6,000 PIUs, and Rs 3 between 6,000 and 8,000 (with an exemption below 4,000 PIUs and a ceiling at 8,000 PIUs embodied in the land-holding laws).

The rate is thus low: the maximum tax bill is Rs 10,000; just \$334. The 4,000 PIUs exemption is high—anywhere from 75 to 150 acres, depending on location. This makes the tax base extremely narrow, and the estimated revenue yield is extremely low (about Rs 50 million). Finally, the PIUs are based on a decades-old assessment, and the tax base is now very outdated. It is also not clear that all loopholes have been closed. Once the PIU-based liability has been paid, agricultural income can still be used as a tax shelter. When land functions as a tax shelter, land use is distorted.

An agricultural wealth tax also is in place; agricultural land will be valued at Rs 200 per PIU. There is a basic exemption of Rs 1 million, below which no wealth tax is paid. There are also exemptions for a farmhouse, agricultural machinery, farm vehicles, and Rs 100,000 of agricultural land. Tax is then payable at a sliding scale of 0.5 percent to 2.5 percent in blocks of Rs 400,000. Finally, agricultural wealth is not added to non-agricultural wealth for the purposes of determining tax liability. Like income tax, the wealth tax base is narrow and outdated; exemptions are high, rates low; and the principle of horizontal equity is again not satisfied.

Of paramount importance is the basic principle that all income should be taxed in the same manner, regardless of source. The size and direction of resource flows between different sectors should not be relevant to any individual tax liability for a given amount of income. The revenue-generating capacity of agricultural taxation will increase with an improved price policy and the removal of distortions in input markets. Progressive direct taxes on income or land would be desirable, and such a system will have to replace the current system of inefficient and inequitable resource transfer and commodity-specific taxation, with the possible exception of taxes on commodities in which Pakistan has market power.⁶ Large farmers have very low payment rates for services, which increases their gains from the current subsidy regime.

POLICIES AFFECTING INPUT MARKETS

Government policy is also creating constraints in input markets. Timely avail-

⁶Pakistan likely has market power in cotton. However, static optimal tariff arguments have not worked well in the dynamic context and Pakistan's market power in cotton is being eroded by the emergence of new producers.

ability of fertiliser is essential, but phosphate, now being imported by the public sector, is rarely delivered on time or in sufficient quantities, creating an imbalance between nitrogen and phosphate use. While the recommended ratio is close to 1:1 for most crops, Pakistan's ratio is at best 3:1. Despite the fact that the phosphate imports are late year after year, the government seems unable to respond to the problem.

Fertiliser policy is imposing large hidden costs on farmers, including search costs for scarce supplies, uncertainty about availability leading to panic buying, and depressed yields because of lack of availability at the required time. These costs mean that any benefit to farmers from lower prices is being dissipated.

The benefit of a liberalised input market is evident from the extraordinary growth in pesticide use after the subsidy was ended and the entry to the market was liberalised. Indeed, widespread pesticide use is widely held to explain the dramatic growth in cotton yields in the 1980s.

Fertiliser pricing policy also has harmful intersectoral effects. Natural gas prices for state-run fertiliser corporations are held below the prices for other users, with the objective of reducing the price paid by farmers for fertiliser. The problem is that this pricing policy reduces the availability of gas for use in industry. In an energy-deficient country, this is an expensive way to offset agricultural pricing policies.

Use of improved seed has been held back by problems of availability, accessibility, and quality. On-farm research has estimated that the use of old varieties of seed could be depressing the yields by 15 percent. As in fertiliser, the government policy is causing distortions. Private seed firms have to compete with a large public sector producer, which prices uneconomically and runs losses. Private seed development is also held back by the non-existence of breeders' rights and the lack of trademark protection. Enforcement of laws regarding seed quality is lax. Little work is now being done to develop seeds for fodder crops and high-value food crops.

Factor markets also have been distorted by the government policy. Apart from tractors (see Box 3), the cost of agricultural mechanisation has been further lowered by the access of large farmers to subsidised credit. Research in Pakistan and elsewhere has shown that mechanisation has far greater labour-displacing than output-enhancing effects. While some mechanisation was inevitable, the policy-induced lowering of tractor prices led to premature tractorisation and labour displacement.

Agricultural Credit

Research generally finds that higher credit use is correlated with higher input use, and possibly higher output. Credit is also important in alleviating poverty, particularly in financing small-scale projects in the rural non-farm sector. Credit is particularly important to the emerging sectors, such as export horticulture, which

requires substantial investment, both short-term and long-term. Given the significant government presence in credit provision, it is important to assess the record in this area. Figure 1 shows the formal agricultural credit disbursed since 1981 by the major lenders to the sector.

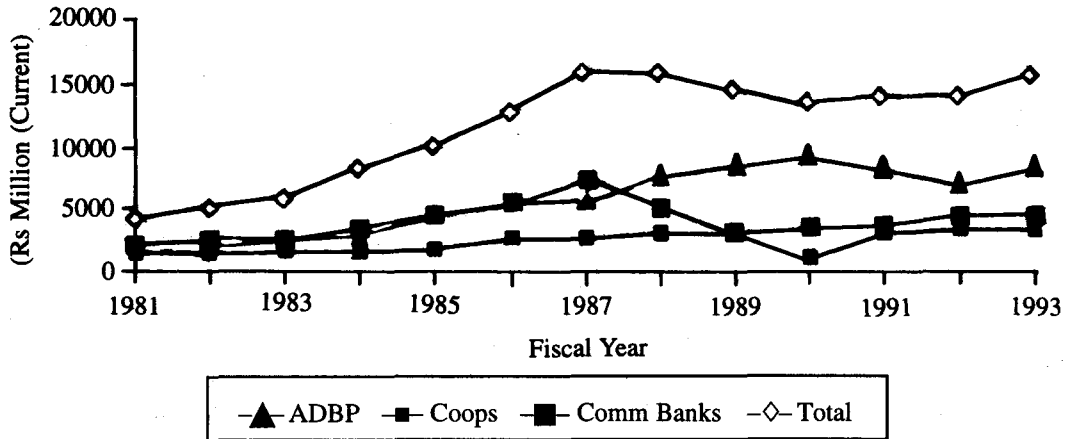


Fig. 1. Credit Disbursement.

Lending by all agencies increased until 1987, and by the Agricultural Development Bank of Pakistan (ADBP) until 1990. Stagnation in lending and the recent bail-out of agricultural cooperatives by the government are signs of serious problems in the rural financial system. The formal credit sector lacks dynamism. Two institutions (the ADBP and the Federal Bank for Cooperatives) comprise virtually the entire formal sector. Both have failed to mobilise deposits, and rely on transfers to maintain the lending capacity. Deposits have been discouraged through interest rate ceilings and the availability of more attractive government bonds. Cheap financing from the public sector gave the state banks no incentive to mobilise deposits. Prudent financial regulation of the institutions is non-existent.

The 1972 banking reforms forced commercial banks to meet a target level of lending to the agricultural sector. Quotas were also introduced for lending by size of farm. However, the quota regime has not been effective in improving the credit access of small farmers. Agricultural lending in general has a poor record. Lending is conducted at non-economic rates, for non-viable projects, and is directed to large farms and the rural elite. As in many developing countries, the credit system has poor enforcement and many non-performing loans. Attempts at recovery can take years. The ADBP provides concessionary loans for tractors with an explicit interest subsidy and a poor recovery rate (around 60 percent in recent years). Thus, distortions in the credit market have wider effects: in this case, they lower the price of tractors and introduce a major distortion in factor prices.

Collateral requirements are a major obstacle to small farmers. Among small farmers, credit access has increased much faster for owners and owner-tenants than for tenant farmers. Nevertheless, there is a bizarre side to the use of land as collateral—foreclosures are non-existent. This obviously gives rise to perverse incentives. The use of crops as collateral has been proposed as a partial solution to the lack of credit. This, however, exposes the bank to much additional risk—variability in the price of the crop and the chance that the purchaser might not pay for the crop. These risks are present for all crops, but are particularly pronounced for horticultural export crops. Banks do not have the technical capacity to assess or price these risks, and would likely limit lending even if the use of crops as collateral was permitted.

Informal finance, which is estimated to account for 70 to 80 percent of agricultural credit, is geared towards meeting short-term credit and consumption loans. This is partly because most of the informal sector is illegal. Long-term investment and saving needs are correspondingly neglected. Small farmers have generally not been drawn into the institutional credit system despite official statistics showing that most institutional credit goes to small farmers. Commission agents and merchants have remained an important source of credit, even as formal credit provision has greatly expanded. They use tying arrangements as a substitute for collateral, and interest rates are usually much higher than in the formal system. Non-institutional rates are far higher than institutional rates. These higher rates partly reflect informal lenders' high screening costs [Aleem (1990)]. Since collateral is rarely available in the informal market, lenders must undertake costly assessments of default risk themselves.

Even in the informal market, rejection rates are high—more than 50 percent in one village in Sindh. While this includes some bad projects, it also includes some projects with long gestation lags, or projects that would be economically viable, but not at the lender's required rate of return. In this same village, it emerged that the main cost to lenders arises from delinquent payments, which the lender must pursue. Aleem (1990) also finds that market equilibrium involves many lenders, each making a few small loans. Thus, the average cost per loan is high, as reflected in informal sector interest rates. Despite the cost, small farmers gravitate towards the informal sector because of its flexible procedures.

Sources of the Problems

Some of the problems are rooted in policy distortions. The rural finance system has been used as an ineffective conduit for transfers to the poor. Rationed credit will inevitably be captured by the better-off. Credit was seen as a tool for offsetting the transfers from agriculture resulting from the output price policy. Some problems with enforcement can be traced to inadequacies in the maintenance of property rights.

There are structural issues that would hinder the credit market even if policy distortions were non-existent. First, financial intermediation is inherently difficult in predominantly agricultural rural areas. Clients are dispersed, so the cost of serving them is high. Pakistan's poor infrastructure does not help. The cost of gathering information about projects also is high. Second, and more important, farmers' incomes are subject to common influences. Insurance is difficult and liquidity needs are highly seasonal—everyone needs liquidity at the same time, and everyone wants to save at the same time. Aleem (1990) estimates that seasonal needs accounted for half the total demand for credit.

Since liquidity needs are correlated across space and time, banks need to be allowed to intermediate in different markets. This is the case for integrated rural financial markets, both in the type of operation (deposits and loans) and across regions. However, this creates an inherent tension: while information about projects resides at the local level, which would suggest the usefulness of specialised credit provision, such a specialised provider would be unable to diversify to meet the insurance and liquidity needs. This suggests a role for a Grameen bank-type institution in conjunction with commercial banks.

The problems in the credit market are reinforced by policy failures in other areas. Since agriculture is likely to be credit-rationed even in a freely functioning credit market, the net worth of farmers will be an important determinant of credit availability. More profitable farmers will be better able to self-finance projects and so increase investment in agriculture. Therefore, the incentive distortions described above, by lowering agricultural incomes, have compounded credit rationing problems. Policy reforms in other areas that raise incomes in agriculture may thus help boost investment in the sector.

PUBLIC SECTOR INSTITUTIONS, SERVICES, AND EXPENDITURES

The government's active role in agriculture is manifested in public sector agricultural institutions, service provision, and expenditures. In practice, these areas overlap; although in principle, they need not. For instance, the government could fund the provision of services without being actively involved in the provision itself. The key role of the public sector in agriculture should be to provide an enabling environment for private sector agriculture, while assisting in reducing rural poverty and ensuring sustainable resource use. This means that government will have to confine itself to certain functions.⁷

⁷The nature and extent of government intervention should be dictated by the nature and extent of market failures in the agriculture sector, including public goods, externalities, moral hazard problems, infant industry situations, and monopolies.

Government intervention, even in legitimate areas, can be problematic. While the government may appear to be intervening to correct a market failure for the public good, in fact the intervention may be serving private interests, including those of the public officials themselves. In areas where government has no legitimate role, those benefiting from intervention become a strong force to maintain the intervention.

Institutions and Services

Public institutions have proliferated, and the provision of most major services has a significant public sector presence (Table 7). Activities include input supply, infrastructure provision, regulation, resource mobilisation, and output price intervention, across federal and provincial levels of government. The broad range of activities in Table 7 clearly goes beyond what would be considered legitimate areas for intervention. The table also indicates the likelihood of considerable inefficiency and duplication of functions among institutions.

Over-representation of the public sector is most pronounced in input supplies (see the section on public enterprises below). Public-sector entities that handle major inputs are inefficient, inflexible, and often unresponsive to market conditions. Take, for example, the aforementioned shortages of phosphatic fertiliser year after year: this is usually blamed on transport problems, but this begs the question of why the planning of imports cannot begin sooner. Public presence in input provision has stifled the growth of the private sector, leaving the private producer starved of inputs at the right time or in the right place. This contributes to the inefficiency of other agricultural support services. For example, if seed or fertiliser is not available when needed, the impact of public research and extension is diluted.

There are inefficiencies and weaknesses even where the public sector has a legitimate role. Duplication of functions or poor coordination between agencies are serious problems. In cotton, for instance, there is a multiplicity of research institutes, with overlapping functions. The federal Pakistan Central Cotton Committee is responsible for research on cotton, while Punjab and Sindh also have cotton institutes. Then the Atomic Energy Commission also breeds cotton varieties. Both federal and provincial research institutes work on the same commodities or areas, with little or no coordination. The same problem exists with adaptive research within the provincial research and extension departments.

Inadequate coordination between WAPDA and PIDs during the planning and implementation of irrigation and drainage projects makes the task of future operations and maintenance difficult. There is also poor coordination of on-farm water management programmes between the Ministries of Agriculture and Water. Property rights in agriculture are monitored by land management institutions, which operate at the provincial level. The land records system is cumbersome and outdated.

Table 7

Agricultural Institutions

Activity/Commodity	Federal	Punjab	NWFP	Sindh	Balochistan
INPUTS					
Land		BOR	BOR	BOR	BOR
Fertiliser	MINFAC(FID)* NFC/NFML	PAD(PADSC)	PAD(ADA)	PAD(SASO)	PAD
Seed	MINFAC(FSCD)	PAD(PSC)/	PAD(ADA)	PAD(SASO)	PAD
Water	MOW&P	PID	PID	PID	PID
	MINFAC(FMWC)	PAD(OFWMD)	PAD(OFWMD)	PAD(OFWMD)	
	PAD(OFWMD)	Credit	SBD/ADBP/	PCD(PCDS)	PCD(PCDS)
	PCD(PCBS)	PCD(PCBS)			
	FBC/NCBs				
Plant Protection Ext. & Ad. Res.					
Agri.	MINFAC(PPPD)	PAD(PADSC)	PAD(ADA)	PAD(PAED)	PAD(PAED)
Forestry	MINFAC	PFD	PFD	PFD	PFD
	PFD				
Livestock	MINFAC	PLD	PLD	PLD	PLD
	PLD				
Fisheries	MINFAC/MFD	PFD(PFSD)	PFD(PFSD)	PFD(PFSD)	PFD(PFSD)
Machinery	MINFAC	PAD(EngD)	PAD(EngD)	PAD(EngD)	PAD(EngD)
Soil Conservation	MINFAC	PAD(SCD)	PAD(SCD)	PAD(SCD)	
Research	MINFAC(PARC)	PARB/AUF/	AUP/	SARD/SAU/	BARB/ARIS
	(AZRI)	ARIS	ARIS	ARIS	
	(PCCC)/KARINA				

Continued-

Table 7 —(Continued)

Activity/Commodity	Federal	Punjab
Training		
Irrigation	MIRIS (IWARSI)/(DRIP)	PIRI
Forestry	MINFAC(PDI)	FSS
INFRASTRUCTURE		
Electricity	MOW&P/WAPDA	
FTM Roads	MLG&RD	LG&RDD
Minor Irrig.	MOW&P	PID
REGULATION/INTERVENTIONS		
Prices	AFCOM	
Irrigation	WAPDA	PID
Seed Certif.	MINFAC(FSCD)	
Electricity	WAPDA	
Quality Control	Food & Drug Insp.	
Environment	PEPA	EPA
RESOURCE MOBILISATION		
Land Revenue	Collector	Collector
<i>Ushr</i>	Collector	Collector
Octroi	DC	DC
<i>Abiana/Drainage Cess</i>	Collector	Collector
AG. STATISTICS	MINIAC(CH)	CRD

NWFP	Sindh	Balochistan
FSS	FSS	FSS
LG&RDD PID	LG&RDD PID	LG&RDD PID
PID	PID	PID
EPA	EPA	EPA
Collector	Collector	Collector
Collector	Collector	Collector
DC	DC	DC
Collector	Collector	
PAD(SDIR)	PAD(DSIR)	PAD

Continued-

Table 7 –(Continued)

AG. Census	SD(PACO)				
OUTPUTS					
Procurement	PASSCO/RECP GOP/CEC	PDF	PDF	PDF	PDF

*Explanation of Abbreviations used above.

Abbreviations	Full Names	Abbreviations	Full Names	Abbreviations	Full Names
ADA	Agricultural Development Authority	GCP	Ghee Corporation of Pakistan	PASSCO	Pakistan Agricultural Services and Storage Corporation
ADB	Agricultural Development Bank of Pakistan	IWARSI	International Waterlogging and Research Institute	PCCC	Pakistan Central Cotton Committee
AMRI	Agricultural Machinery Research Institute	KARINA	Karrakoram Agricultural Research Institute for Northern Areas	PCD	Provincial Cooperative Department
APCOM	Agricultural Prices Commission	LG&RDD	Local Government and Rural Development Department	PDF	Provincial Department of Food
ARI	Agricultural Research Institute	MFD	Marine Fisheries Department	PEPA	Pakistan Environmental Protection Agency
ATI	Agricultural Training Institute	MINFAC	Ministry of Food, Agriculture and Cooperatives	PFD	Provincial Forest Department
AUP	Agricultural University of Peshawar	MIRI	Mona Irrigation and Reclamation Institute	PFI	Pakistan Forest Institute
AUF	Agricultural University of Faisalabad	MLG&RD	Ministry of Local Government and Rural Development	PFsD	Provincial Fisheries Department
AZRI	Arid Zone Research Institute	MOW&P	Ministry of Water and Power	PID	Provincial Irrigation Department
BAC	Balochistan Agricultural College	NCBs	National Commercialised Banks	PIRI	Punjab Irrigation Research Institute
BARB	Balochistan Agricultural Research Board	NFC	National Fertiliser Corporation	PLD	Provincial Livestock Department
BOR	Board of Revenue	NFML	National Fertiliser Marketing Limited	PPPD	Pakistan Plant Protection Department
CEC	Cotton Export Corporation	OFWMD	On-Farm Water Management Directorate	PSC	Punjab Seed Corporation
Collector	District Collector	PACO	Pakistan Agricultural Census Organisation	RECP	Rice Export Corporation of Pakistan
CRD	Crop Reporting Directorate	PAD	Provincial Agricultural Department	SARO	Sindh Agricultural Research Organisation
DC	District Council	PAED	Provincial Agricultural Extension Department	SASO	Sindh Agricultural Services Organisation
DRIP	Drainage and Reclamation Institute of Pakistan	PARB	Punjab Agricultural Research Board	SAU	Sindh Agricultural University
EngD	Engineering Directorate	PARC	Pakistan Agricultural Research Council	SBP	State Bank of Pakistan
EPA	Environmental Protection Agency	PADSC	Punjab Agricultural Development and Supplies Corporation	SCD	Soil Conservation Directorate
EW	Economic Wing			SD	Statistics Division
FBC	Federal Bank of Cooperatives			SDIR	Statistics Directorate
FID	Fertiliser Import Department			SRPO	Sindh Regional Planning Organisation
FS	Forest School			SSC	Sindh Seed Corporation
FSCD	Federal Seed Certification Department			WAPDA	Water and Power Development Authority
FTM	Farm-to-Market				
FWMC	Federal Water Management Cell				

A streamlining of the system is a prerequisite for smooth functioning of the land market.

Environmental protection agencies, at both the federal and provincial levels, suffer from the lack of trained manpower and have taken a long time to become functional. For example, the Pakistan Environmental Protection Council was created in 1983, but met for the first time in 1993. Provincial environmental protection agencies have been active for some time. However, federal-provincial linkages are very weak, and coordination among the provinces is non-existent. Regulatory bodies, such as those for seed certification, quarantine, market monitoring, and quality control, are spread too thinly, and are not performing at the optimal level. For instance, a third successive poor cotton harvest in 1995 is blamed on widespread pesticide adulteration due to non-enforcement of quality regulations.

Nowhere, however, are the weaknesses and inadequacies in public sector institutions more evident than in the areas of research and extension. Deficiencies in research and extension have been highlighted as a factor explaining the lower productivity growth in Pakistan than that of India. Rosegrant and Evenson (1993) have shown that there was a dramatic decline in total factor productivity growth in agriculture in Pakistan after 1975; that did not occur in India. They argue that this can be explained by the level of investment in public research, extension, and literacy, which rose in India but fell in Pakistan.

Research

There is a lack of funding for research in general and for operational funds in particular. The effectiveness of research has declined because of lack of material support, effective planning, monitoring, and evaluation of the research programmes. Researchers lack the proper equipment, and there is a proliferation of research institutes (universities, PARC, NARC, provincial research and monocrop institutes), often with overlapping responsibilities and duplication of research.

Agricultural research broadly covers two areas—plant breeding research, and crop and resource management research. Plant breeding research has been satisfactory, although the lag in getting research to farmers is often long. The average age of wheat varieties in farmers' fields, for example, is about 11 years, compared with an average of 7 years for other developing countries. This reflects failures in extension and seed marketing. There is much duplication of effort in breeding research, and economies of scale could be realised if some breeding institutes at different levels of government were consolidated.

Crop management research emphasises increases in productivity through research on such issues as the timing and method of application of input rather than type of input, land preparation, and harvesting. Resource management research focuses on preservation of the natural resource base. For most crops it is difficult to

find good examples of crop management research that have been translated to farmers' fields. Evidence indicates that key inputs such as water and fertiliser are used inefficiently.

Research has failed to increase input efficiency. Outcomes from well-controlled experiments need to be better tailored to farmer conditions. Issuing technical packages to large, heterogeneous groups of farmers is not enough unless farmers have the means to adapt these packages to their own circumstances. Crop and resource management research lacks a systems perspective. Specialised research tends to ignore interactions between different crops and different agronomic issues. Key long-term issues such as necessary natural resource investments are generally ignored.

Extension

Most studies indicate that the variables that consistently explain farmer inefficiency are farmers' knowledge and skills. As emphasis switches from input intensification to input efficiency, improvements in information and skills play a bigger role in increasing productivity. The information burden on farmers will only increase as agriculture becomes more commercialised and sustainability issues come to the fore. Extension thus plays a central role in improving productivity growth, and also in making the distribution of knowledge more equitable. Small farmers may find it more expensive to acquire knowledge, and so public extension has a role in equalising access to new methods.

Extension programmes are a significant item in the current agricultural budget, but their impact is negligible. An elaborate extension system is already in place for crops, but many farmers question its usefulness. Organisational problems are severe (especially, lack of accountability), and operational funding for extension workers is low. The desired ratio of wage to operational (non-wage) expenditure in agricultural research is 60:40, but the prevailing ratios in many of the provinces are in excess of 80:20 [World Bank (1992)]. For instance, in the NWFP the ratio of salaries to operational expenditure actually deteriorated from 75:25 in 1982-83 to 85:15 in 1992-93. In addition, the salary budget is spread too thinly over extension staff.

There are now over 5,000 village extension workers, but they often lack adequate training, which makes their task of improving the management skills of farmers very difficult. Extension workers with higher education and communication skills are likely to be assigned administrative responsibilities. The system is characterised by a one-way transfer of technology to a few inadequately selected farmers. Women and small farmers are often ignored. Feedback from farmers is poor. In contrast to the system for crops, livestock, forestry and fisheries are neglected. Nor is it fully integrated with water management extension—a clear obstacle to improving

the efficiency of water use.

Much effort was made in the 1980s to implement the training and visit extension system (T&V). It appears that the system had only a modest success. Measures of farmer contact do show an increase, and extension services may have had an impact on increasing pesticide use. However, Husain and Byerlee (1994) could find little evidence that T&V had improved the *quality* of extension advice. An increase in extension contact does not necessarily mean that extension has aided growth. In addition, contact is highly skewed towards large farmers. A survey of extension contact in the Punjab in 1986 showed that 60 percent of the farmers with more than 10 hectares of land had contact with the extension service in the previous year, whereas only 24 percent of the farmers with 5 to 10 hectares had contact over the same period.

Moreover, some of the success of the T&V system can be explained by the poor state of extension service before the system was introduced. By introducing *organisational discipline and some additional funding*, the T&V system was able to improve the previously deficient extension services. It is less clear, however, that the system was the most cost-effective use of resources. It involves a centralised, hierarchical approach that limits feedback and adaptability to local conditions.

The quality of extension services does not compare favourably with that in India. Husain, *et al.* (1994), cited in Byerlee (1994), find that although the training and visit system has increased the quantity of extension advice (visits, messages, and so on), it does not appear to have increased technical knowledge or the rate of adoption of new technology. This contrasts with evidence from a comparable region in India. Two major problems specific to Pakistan are identified. First, implementation of T&V was lacking. For example, one survey found that 20 percent of contact farmers did not know that they were contact farmers, and hence the information flow never went beyond them. Second, messages were inappropriate to farmers' circumstances, and ignored the rational and often location-specific trade-offs that farmers often make. For instance, messages about wheat continue to assume that wheat will be planted on time, whereas farmers often rationally delay wheat planting as a result of interactions in double-cropping systems.

Public Expenditure

Pakistan is one of a group of countries that followed a policy of compensating for the discrimination against agriculture in price policy with heavy investment in rural infrastructure (notably irrigation), agricultural institutions, and subsidies to water, credit, electricity, and fertilisers. We have already shown how these individual components of this policy have been undermined, but it is also instructive to look at the broader picture of expenditure. The most useful way to evaluate public expenditure is in terms of its composition and efficiency. A basic classification is

between current expenditure and development (capital) expenditure. Tables 8 and 9 provide a breakdown of each type of expenditure at the federal and provincial levels, with figures also provided for some major categories of expenditure within each class. Current expenditure has risen sharply while development expenditure has fallen, which indicates that public investment in agriculture has been squeezed by other types of spending of dubious benefit to agriculture. However, the development budget itself includes items that would not normally be considered part of investment in agriculture, such as the fertiliser subsidy. Pakistan's subsidies have typically been untargeted subsidies where the payment depends on the level of activity of the farmer; this creates an immediate bias towards larger farms. The natural tendency towards rent-seeking by bureaucrats and farmers is only likely to exacerbate this bias.

Subsidies are a major component of the overall expenditure programme. The ratio of current subsidy to current expenditure for the provincial governments has varied from 19 percent to 44 percent. Over the past 12 years, the same ratio for the federal government has varied from 36 percent to 97 percent (Table 10). Similarly, development subsidies borne almost exclusively by the federal government also have been high, from 24 to 83 percent of the development expenditure. Subsidies have fallen to some extent in recent years, both absolutely and relative to total expenditure (Tables 10 and 11).

Wheat subsidies have reduced the domestic price variance: the standard deviation of domestic wheat prices was just 17 percent of the standard deviation of the border price between 1960 and 1984 [Krueger, Schiff and Valdes (1988)]. Moreover, the government has insulated consumers from major swings in wheat prices through the massive procurement and marketing operations supported by the food subsidy—24 percent of production in 1970–80, and 31 percent thereafter [Alderman (1993)]. In comparison, food procurement in Bangladesh and India has been less than 10 percent of production per year.

Although the country has achieved a satisfactory level of food security, the policy of public intervention has come with a price. The level of wheat production has remained low because both farmers and traders were discouraged by low prices. Until recently, Pakistan used the rationing system to ensure low wheat flour prices to urban as well as some targeted rural consumers. The rationing system is now gone, but it has been replaced by a programme of open market operation—buying post-harvest stock and releasing it later at a pre-determined fixed margin over the procurement price, uniformly all over the country. Such practices have inhibited the growth of private storage, transportation, and active private trade in food grain. The cost of maintaining food subsidies has been high, ranging up to 66 percent of current expenditure (Table 11).

Table 8

Pakistan Public Expenditure in Agriculture
(Current Expenditure—Millions of Constant Rupees (1980-81 Prices))

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	Growth Rate
Punjab													
Crop Agriculture	260.1	299.3	306.3	331.9	261.1	383.0	254.0	333.1	344.4	377.88	366.1	378.3	4.13
Irr. Land Reclaim	876.1	949.1	1,039.2	1,101.5	150.5	738.9	973.7	908.4	930.8	1,252.12	1,070.5	1,302.0	4.42
Total	1,340.2	1,505.3	1,615.0	1,756.0	1,872.5	1,512.2	1,598.9	1,579.5	1,632.6	1,990.69	1,804.3	2,047.1	4.79
Sindh													
Crop Agriculture	88.2	122.8	109.1	127.1	134.3	144.5	140.2	157.79	166.8	185.25	156.0	153.63	6.74
Irrigation	264.7	304.1	329.8	353.5	394.8	405.4	411.7	373.90	352.5	355.49	358.8	343.55	2.70
Total	430.7	509.2	529.2	578.2	639.3	658.1	659.0	642.65	650.7	676.27	656.5	637.25	4.36
NWFP													
Crop Agriculture	70.5	85.6	114.4	115.6	120.3	120.8	113.4	106.28	106.8	116.40	122.1	130.13	7.69
Irrigation	94.7	108.5	129.0	147.6	222.0	216.0	244.9	235.87	238.7	237.77	253.0	234.87	13.34
Total	216.4	270.1	306.4	348.7	424.7	426.2	450.8	429.22	447.8	460.02	477.0	474.98	10.85
Balochistan													
Crop Agriculture	56.6	65.9	73.2	82.0	95.0	104.7	107.7	103.95	100.0	119.25	135.4	143.44	13.93
Irrigation	71.2	65.5	66.4	88.8	84.7	73.3	76.9	68.36	60.0	73.19	73.5	76.13	0.63
Total	167.6	177.3	192.8	228.1	251.9	253.9	254.8	242.36	244.1	287.68	299.1	314.75	7.98
Federal Government													
Subsidies	na	na	2,744.0	1,318.0	112.0	236.00	4,751.00	2,501.00	2,229.00	1,914.00	978.00	492.00	na
Wheat Sugar Subsidy	na	na	1,039.0	1,318.0	112.0	236.0	3,076.00	1,852.00	1,179.00	1,830.00	978.0	492.00	-0.73
Edible Oil Subsidy	na	1,179.0	1,704.5	0.0	0.0	122.00	1,675.00	649.00	1,050.00	84.3	0.00	0.00	-10.00
Total Federal	145.51	109.4	2,917.0	1,497.6	312.5	413.47	4,919.00	2,670.00	2,393.00	2,085.00	1,196.00	662.39	-0.80
Total National Current Expenditures	2,300.6	2,571.6	6,708.8	5,900.06	5,337.21	5,542.17	9,092.15	5,563.47	6,343.60	6,320.94	5,310.15	5,099.47	3.26

Source: *Economic Survey of Pakistan 1993-94* and *Statistical Supplement 1992-93*. The considerable fluctuation in certain series from year to year indicates that the data may not always be reliable. The 1993-94 figures are budget projections. The growth rates for federal items are calculated from 1984-85 to 1992-93. All growth figures are calculated based on the first and last periods, except for national expenditure growth, which is calculated using a regression trend line on a two-period moving average series. Sub-sectors that are not shown individually are included in the total figures.

Table 9

*Pakistan Public Expenditure in Agriculture
(Development and Total Expenditure—Millions of Constant Rupees (1980-81 Prices))*

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	Average	Growth Rate
Punjab														
Agriculture Credit	215.9	211.7	184.1	225.3	226.9	273.8	124.7	135.5	157.1	138.7	171.2	70.5	187.7	-3.95
Irrigation	424.6	288.2	322.2	272.5	402.5	350.3	182.1	237.1	595.6	545.9	410.5	186.7	366.5	-1.47
Total	785.7	611.8	624.2	601.7	752.1	739.7	398.9	460.7	837.9	762.7	649.5	309.0	656.8	-1.15
Sindh														
Agri. and Agri. Credit	88.8	64.3	71.7	76.5	97.6	138.0	78.5	73.5	89.7	50.88	59.2	48.0	80.8	
Irrigation	193.5	172.1	189.7	193.9	284.9	262.3	181.1	255.9	313.0	273.46	238.5	228.3	232.6	2.51
Total	307.6	269.6	298.3	330.6	440.6	458.9	322.8	393.9	490.6	372.60	359.2	324.8	367.7	3.89
NWFP														
Agriculture	40.2	48.0	48.4	47.0	58.7	72.2	90.1	164.7	58.2	142.40	56.6	64.7	75.2	3.41
Irrigation	34.2	50.4	55.5	51.8	64.1	92.3	60.9	105.3	124.5	145.22	189.4	172.0	88.6	29.70
Total	118.9	126.8	128.1	124.4	152.0	192.4	197.4	316.8	227.4	338.85	302.0	311.5	202.3	14.96
Balochistan														
Crop Agriculture	59.9	53.6	56.5	43.1	56.5	41.0	42.4	41.3	60.2	24.16	41.5	56.2	47.3	-1.26
Irrigation	118.5	122.5	100.8	186.5	156.3	154.5	177.3	166.1	199.4	368.59	415.7	243.5	196.9	15.77
Total	243.7	237.7	221.9	296.5	276.0	240.5	263.4	246.3	280.4	423.04	491.3	360.3	292.8	5.70
Federal Government														
Food & Agriculture	1,879.0	1,713.5	1,551.5	2,349.4	1,579.5	1,337.0	1,181.6	1,163.8	809.7	1,130.17	711.6	479.3	1,400.6	-6.08
Irrigation	873.3	894.1	544.8	867.9	1,011.4	608.1	363.6	920.7	775.4	312.07	334.1	507.5	682.3	-4.76
Food Storage	219.5	118.7	175.7	47.6	69.8	29.9	3.3	50.9	31.8	5.28	0.0	0.0	71.1	-9.09
Federal Subsidies														
Fertiliser Subsidy	1,623.0	1,220.0	1,137.1	1,766.6	788.7	1,389.2	1,428.6	674.8	678.4	1,224.00	333.3	309.0	1,045.3	-0.96
Tubewell Subsidy	2.0	13.3	13.3	11.7	12.5	6.4	4.7	4.4	na	0.00	0.0	na	na	na
Total	4,603.6	4,129.9	3,665.1	5,240.4	3,665.1	3,621.4	3,149.9	2,941.1	2,421.9	2,791.05	1,731.9	1,448.1	3,284.1	-2.47
Total National Dev. Expenditures	6,062.00	5,389.0	4,951.0	6,605.5	5,298.5	5,259.5	4,337.4	4,363.4	4,258.5	4,688.27	3,534.1	2,954.0	4,977.0	-3.69
Total National Agri. Expenditures	8,362.00	7,960.9	11,660.5	12,512.3	10,635.7	10,801.3	13,429.5	9,926.9	10,602.1	11,009.20	8,844.2	7,853.4	10,229.9	-0.57

Source: *Economic Survey of Pakistan 1993-94*. The growth rates for federal items are calculated from 1984-85 to 1992-93. All growth figures are calculated based on the first and last period, except for national expenditure growth, which is calculated from a regression trend line on a two-period moving average. Sub-sectors that are not shown individually are included in the total figures.

Table 10

*Provincial and Federal Expenditure and Subsidy
(Millions of Constant Rupees)*

Year	Provincial Expend. (Total)	Provincial Subsidy	Subsidy as a Percentage of Expenditure	Federal Expend. (Total)	Federal Subsidy	Subsidy as a Percentage of Expenditure
Current						
1982-83	2155					
1983-84	2462					
1984-85	3792	1149	30	2917	2744	94
1985-86	4409	1498	40	1498	1318	88
1986-87	5025	1836	37	313	112	36
1987-88	5129	2278	44	535	358	67
1988-89	4173	1209	30	4919	4755	97
1989-90	2894	na	na	3319	3150	94
1990-91	3950	975	25	2393	2229	93
1991-92	4236	821	19	2085	1914	92
1992-93	4114	877	21	1196	978	82
1993-94*	3474	963	28	540	492	91

Continued-

Table 10 –(Continued)

Development			
1982-83	1458	2	0
1983-84	1259	13	1
1984-85	1286	13	1
1985-86	1365	12	1
1986-87	1633	13	1
1987-88	1638	6	0
1988-89	1187	5	0
1989-90	1422	4	0
1990-91	1837	0	0
1991-92	1897	0	0
1992-93	1802	0	0
1993-94*	1306	0	0

Source: Tables 8 and 9.

*1993-94 figures are budget figures, and are thus subject to major revision.

4604	1625	35
4130	1233	30
3665	1151	31
5240	1778	34
3665	801	22
3621	1396	38
3150	1433	45
2941	652	22
2422	678	28
2791	1224	44
1732	333	19
1139	309	27

Table 11
Food Subsidy and Expenditure
(Millions of Constant Rupees)

Year	Total Subsidy	Total Current Expenditure	Subsidy as a Share of Current Expenditure (Percent)	Subsidy as a Percentage of Agriculture GDP
1982-83		2301		
1983-84		2572		
1984-85	3893	6709	58	4.42
1985-86	2816	5907	48	3.00
1986-87	1948	5337	37	2.01
1987-88	2514	5542	45	2.53
1988-89	5960	9092	66	5.63
1989-90	2501	5563	45	2.29
1990-91	3204	6344	51	2.80
1991-92	2735	6321	43	2.18
1992-93	1855	5310	35	1.54
1993-94	1764	5408	33	1.45

This system is not achieving its stated goal because the price of flour is already market-determined. Millers are absorbing most of the subsidy on wheat as rent, and the milling industry has excess capacity. In 1993-94 the retail price of flour was 95 percent of the import parity price of flour, so the subsidy's effect on the retail price of flour is minimal.⁸

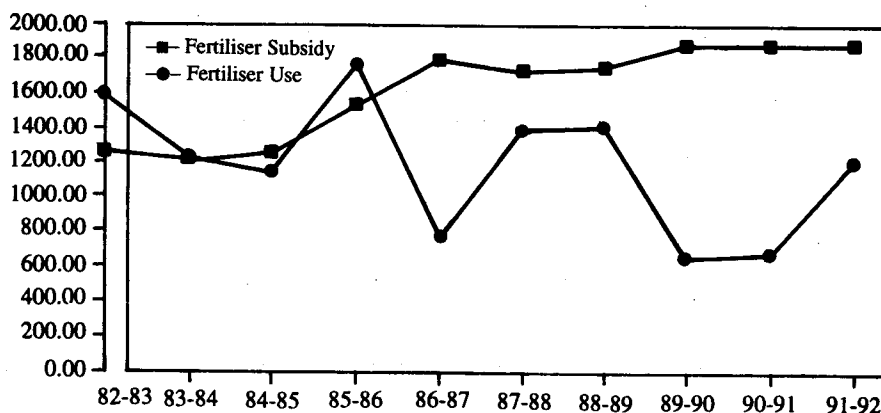
Food security is best ensured by raising the real income of households; controlling wheat prices runs counter to the goal of raising the real income of poor farmers. The subsidy regime has failed to compensate for depressed output prices for a number of reasons. For example, the cost of fertiliser distributed by government agencies in Pakistan has been much higher than that delivered by the private sector, and this inefficiency loss is borne by the public exchequer. Public seed corporations have not been effective either. Farmers have been deprived of the benefits of competitively driven prices and an active commercial market.

Cheap inputs also encourage waste through overuse, particularly by poor farmers not well-versed in agronomy. Fertiliser and seed subsidies are essentially regressive since they mostly benefit the larger farmers who use a large amount of the subsidised inputs. Also, the administration of the subsidy programme encourages

⁸The import parity price of flour is computed as the import parity price of wheat plus the milling and distribution charges.

rent-seeking. Commercial policy and credit subsidies have combined to make agricultural machinery very cheap, which has resulted in very low productivity of machinery [Ali and Velasco (1993)], while creating incentives to displace tenants from land.

It is not even clear that the fertiliser subsidy boosted fertiliser consumption. The subsidy has represented the largest fiscal outlay of the government after the food subsidy. However, its benefit over a long period is questionable. There is a remarkable lack of congruity between fertiliser subsidy and use of fertiliser—the correlation is -0.51 (Figure 2).⁹ Fertiliser usage rates are apparently not affected by the subsidy. Perhaps in recognition of this, fertiliser subsidies are being cut and are expected to be phased out completely by 1995.



Note: Fertiliser consumption is measured in thousands of metric tons.

Fig. 2. Fertiliser Subsidy and Consumption in Pakistan

The shortfall between water charges and expenditure on irrigation also represents a major subsidy. The active market for tubewell water shows that farmers are willing to pay more than the current price for water. This underpricing has led to overuse of water, deterioration in the system resulting from the squeeze on the operation and maintenance (O&M) expenditure, and massive rent-seeking, with most of the rents going to large farmers and irrigation officials.

Electricity is also a big hidden subsidy. It is provided at a concessional rate for operating electric tubewells. Electricity thefts are considerable. However, as the current power crisis shows, this subsidy is of dubious benefit to farmers. Rural areas can be without power for upto 12 hours a day. Capital expenditure on electricity generation has been crowded out by the low rate of cost recovery.

⁹Pearson correlation coefficient between subsidy and fertiliser consumption.

Inadequate Expenditure

Public expenditure has been insufficient in other areas. Natural resource degradation arising from waterlogging and salinity has not been sufficiently addressed. To the extent that these problems are due to inadequate drainage (a public good), the government can play an increased role. At the same time, the government has provided funds for the development and maintenance of private tubewells, even though most of the benefits of tubewells are privately appropriated (although there may be some public benefit of tubewells arising from lowering of water-tables).

Particularly serious is the neglect of O&M expenditure on the irrigation system, which has consequently deteriorated (Table 12). The shortfall varies by province, reaching as high as 37 percent in Sindh—and stems from low water rates and inadequate assessment and collection of charges.¹⁰ In addition, revenue does not go directly to the provincial irrigation departments, which creates poor collection incentives.

Table 12

*Operation and Maintenance Expenditure and Requirements
(Millions Current Rupees)*

Fiscal Year	1988	1989	1990	1991	1992
Requirements	1,704	1,875	2,161	2,408	2,617
Expenditure	1,704	1,513	1,617	1,718	1,985
Shortfall (Percent)	0	-19	-25	-29	-24

Source: World Bank (1994).

Rural infrastructure deficiencies also have been widely documented. Witness the road density in Pakistani Punjab, which is just one-half of the road density in Indian Punjab [Mellor (1993)]. Road maintenance expenditure has been seriously neglected; it was Rs 1.3 billion in 1990-91, far short of the Rs 8 billion required for proper maintenance of the road network. It is also clear that education spending has been seriously neglected.

Public Enterprises in Agriculture

Although the expenditure on public enterprises is not included in the budget,

¹⁰Moreover, the required levels did not include public tubewells, on the assumption that these would be privatised. But privatisation of groundwater tubewells is slower than planned, and the O & M needs of these tubewells have been considerable.

their losses are met mostly by borrowing from banks guaranteed by the government, and sometimes by direct support. Guaranteed borrowing is effectively part of the fiscal deficit and crowds out the private sector from the credit market. Public enterprises often have an undesirable financial structure, with little equity and heavy reliance on short-term public debt.

There are many public institutions in Pakistan for implementing government interventions in agricultural markets, including output market price control, control of input supplies, and external trade of agriculture output. A host of public sector corporations were set up for reasons such as providing cheap food to urban consumers and guarding farmers against private exploitation. Notable among these agencies are the Punjab Seed Corporation, the Sindh Agricultural Services Organisation, Punjab Agricultural Development and Supplies Corporation, Pakistan Agricultural Services and Storage Corporation, Agriculture Development Authority, Cotton Export Corporation, and Rice Export Corporation of Pakistan. All are inefficient, with a high cost of operation compared to the private sector. For example, a study in 1989 showed that the private rice mills operated at 40 percent less cost than the Rice Export Corporation. Table 13 summarises the operating profits and losses of four major agriculture sector corporations.

Table 13

*Earnings of Major Public Agriculture Corporations
(Millions Current Rupees)*

	1988	1989	1990	1991	1992	1993	1994
Punjab Seed Corporation	(2.58)	(0.97)	15.14	9.75	18.79	26.75	-
Sindh Agricultural Services Organisation	-	(10.01)	(42.37)	(50.84)	(40.82)	(58.77)	-
Punjab Agricultural Development and Supplies Corporation	-	-	-	-	-	(13.36)	16.04
Pakistan Agricultural Services and Storage Corporation	-	-	(169.25)	79.87	85.96	55.80	(89.39)

The case of the Punjab Seed Corporation is typical. Audited accounts for the past six years show that the company had losses in the early years but turned around later on. However, certain expenditure items have not been taken into account, whose inclusion would likely depress the performance picture. First, the seed farms acquired from the Punjab Agriculture Development and Supplies Corporation (PADSC) have not been valued. The implicit land rent of these farms must be added

to the operating costs to get a true estimate of costs. Second, the Corporation's loans from the nationalised banks have been underwritten by the government at around 12.5 percent, which amounts to a subsidy. Third, the Corporation borrowed a working capital of Rs 50 million from the Government of the Punjab, but has not paid the interest on this loan. Fourth, the Corporation receives occasional grants from the Government of the Punjab for expansion of facilities.

The Sindh Agricultural Supplies Corporation distributes fertiliser and seeds to farmers in Sindh. This Corporation receives reimbursement of the distribution costs on a pre-determined—and insufficient—formula. As a result, the organisation has had operating losses in all the years for which data were available (1989–93).

Available data for the Punjab Agricultural Development and Supplies Corporation also show net operating losses. The positive profit shown for 1993–94 is merely a figure projected by the Corporation. The Pakistan Agricultural Storage and Services Corporation, which is engaged in procuring, preserving, storing, and distributing food grains (especially wheat) has been operating with a budget close to Rs 3 billion. The operating finances of this organisation show major losses prior to 1990. It recovered slightly in 1992 and 1993, but again went in the red in 1993.

The rationale for the government providing marketing services in an economy not characterised by market failure is extremely tenuous. A review of the marketing institutions by the World Bank (1990) has indicated that problems can generally arise with parastatal marketing in developing countries, and some of these are evident in Pakistan. First, under a system of controlled prices, inadequate marketing margins are the primary reason for the inadequacy of marketing services provided by both the public and private marketing channels. In Pakistan, fertiliser and seed are heavily subsidised and the state organisations have difficulty in realising their full operational costs from the consumers. The prices set by the government also are imposed on the private sector, either through administered prices or by the presence of government marketing agencies.

Second, for large parastatals, the cost of inefficient operations is reflected in both the price and the level of service. There is evidence that private sector prices have been lower than those of the state enterprises in many instances of distribution of fertiliser and seeds. Parastatals have a poor record of cost control because they usually practise "cost-plus" pricing, which gives managers no incentive to control costs. Even with the presence of parastatals, private sector marketing channels have continued to service farmers, and often are preferred by them. This calls into question the argument that expansion of public-sector marketing services is needed to check alleged exploitation by merchants. The resources devoted to them could have been directed towards expenditure that would benefit agriculture, such as promoting the adoption of productivity-enhancing technology by farmers, building infrastructure to link markets, and supporting private entrepreneurship. The continued pres-

ence of subsidies and regulations propping up state enterprises slows market development and impedes the transmission of prices to agricultural producers (through inefficiency, corruption in procurement, etc.).

The Government of Pakistan's active role in agriculture has, for the most part, not benefited the sector. What is then the best way for the government to proceed? We outline a programme of policy and institutional reforms that is urgently needed to create an enabling environment for private agriculture while ensuring appropriate government interventions.

NEEDED REFORMS¹¹

Price and Trade Policy

In keeping with structural reforms, output prices need to be transmitted to farmers with fewer distortions. Price supports and controls, which cause distortions in market signals and huge fiscal costs, need to be phased out. The government's aim of reducing price fluctuations can be achieved by other, more cost-effective means, such as promoting on-farm storage, private sector storage, and futures trading. The government must consider ending the subsidy on wheat imports and ensure that there are no import restrictions on wheat and flour. It would be desirable to remove protection of sugarcane, allowing diversion of scarce resources (such as water and land) to more efficient uses.

Trade reform will have to be completed speedily. In particular, the taxes on cotton exports, the duties on sugar imports, and the quantitative restrictions on both will have to be removed; any loss of revenue would be offset by removing the wheat subsidy. The terms of trade for agriculture will have to be corrected by lowering industrial protection. The combined effect of the price and trade reform will be to improve the allocation of resources and the profitability of agriculture.

The government will need to halt the sort of micro-management that can be better undertaken by the private sector. Importation of fertiliser is a prime example. There is also no need for government presence in the marketing of improved (certified) seed.

Land reform is a long-term project that will require careful consideration. However, some immediate measures would be highly desirable to correct land market distortions, which include artificially low machinery prices and unequal access to credit. These reforms would increase the opportunities available for farming, and for wage labour on employment-intensive farms. The land titling process can be modernised and streamlined, including the establishment of a system of

¹¹See Rashid Faruqee (1995) "Pakistan's Agriculture Sector: Is 3 to 4 Percent Annual Growth Sustainable?" Policy Research Working Paper 1407. Washington, D.C.: The World Bank.

permanent title deeds to land. Security of tenure should be ensured without creating further disincentives to rent out land. This would facilitate long-term (especially natural resource management) investments. The minimal goal of land market reforms must be to ensure that land is operated and managed by the most efficient user. A prerequisite for this is full economic pricing of water and mechanised inputs. With water charges currently so low, there is little incentive to use the water rights attached to land in an efficient fashion. When these reforms are coupled with ending the use of land as a tax shelter and credit vehicle, the efficiency of land allocation will improve greatly.

It would be desirable to end directed credit in any form. Groups finding it hard to gain access to credit could perhaps be helped by a scheme to underwrite the set-up costs of credit. Such assistance would be one-time, and would reduce the transaction costs; and the best option is not to have any recurrent subsidy. Credit reforms are essential to increasing investment in the sector.

Institutional Reforms

There are some areas where an increased role of government is necessary, specifically to strengthen market institutions. Most of Pakistan's agriculture has entered a post-Green Revolution stage of development that requires new strategies to enhance input efficiency and maintain and improve the quality of the resource base.

Irrigation should undergo a demand-based decentralisation, through the development of water-user associations at the distributary level. These associations would be participatory farmer organisations that will assume responsibility for downstream operations and maintenance of irrigation systems. Upstream at canal command would be the responsibility of commercially-oriented public utilities, and explicit contractual obligations would exist between the utilities and the users' associations. At provincial level, autonomous water authorities would be responsible for major provincial storages link canals, off-farm and provincial drains, flood control, and management.

Irrigation charges can be restructured to reflect the cost of provision, the quality of service provided, and the cost of competing alternatives. However, a rise in irrigation charges without any improvement in service will undercut the legitimacy of the overall reform programme.¹² Disputes between different groups in the irrigation system will be resolved by powerful regulatory authorities, free from political influence. A legal and institutional framework for the market exchange of water rights will also be established. Off-farm drainage, a public good, will continue to be the responsibility of government. Costs of drainage can be recovered from farmers.

¹²The same can be said of electricity charges.

These reforms will increase the efficiency of water use, ensure that the cost of water truly reflects its economic cost, reduce waterlogging and salinity problems, and allow water to go to its most efficient users.

Support for research should continue, but expenditure needs to be restructured so that salaries do not soak up most of the available funds. Research institutions should be made more autonomous, salary restrictions lifted, and other funding sources mobilised. Greater importance should be attached to research in cropping systems. Publicly funded research should stress growth-enhancing public goods, environmental impact, and poverty reduction.

Joint public-private funding of research is also desirable. Private and public sector research financing could, where possible, be on a competitive basis, meaning that the funding to institutions would be on the basis of performance. Coordination between different research institutions will have to be improved, and unnecessary duplication avoided. Adaptive research would provide site- and season-specific recommendations and information adapted to each farmer's needs. Incentives could be provided for greater participation of farmers in defining research priorities.

Since no one is happy with the performance of the extension service, major reform of the service is a top priority. The notion of extension as a top-down, supply-driven process needs to be revised. The goal should instead be to create a demand for information among farmers, a demand which could then be satisfied by extension workers. The service should concentrate more on participatory problem-solving with farmers at the local level, which means substantially improving the education levels of farmers and extension workers.

The extension service will have to be reduced in size. Instead of too many extension agents with too little training, there should be fewer, better-qualified agents. Extension services will have to be geared to problems of all farming systems (including livestock, forestry, and water management), and not just to major crops. It will be desirable to have a more diversified approach to extension, one that responds to the varying needs of farmers and uses the various available sources of extension services, including the private sector. Some extension is already being undertaken by private sector companies. These and non-government organisations could be encouraged to increase the provision of extension services. A system of advisory, fee-based, services by adaptive research institutions to medium-size and large farmers could be encouraged.

The government's role in rural infrastructure provision needs to be strengthened. Increased revenue from tax reforms and savings from the rationalisation of public expenditures on agriculture could be used to finance road-work. Farm-to-village roads would improve the distribution of inputs and marketability of outputs. The transition to high-value (often perishable) foods would be greatly facilitated by better roads.

More emphasis is required on natural resource management problems in agriculture. Policy interventions for natural resource management and the environment will be based on three principles: price adjustments for scarce natural resources in order to provide appropriate conservation incentives; identifying regulatory mechanisms which could be effective in addressing market failure, bearing in mind the poor record of existing regulatory agencies; and restructuring public expenditures to focus on natural resource management priorities.

Market failure is likely to be a problem in environment and natural resource management. Many market failures, such as the excessive application of harmful pesticides, will require public regulation. Increased pesticide use has created a growing resistance among pests, and destroyed natural predators. Integrated pest management would be more effective and environmentally-friendly, as well as consistent with the demands of Pakistan's export markets. An effective institutional mechanism for transmitting knowledge about integrated pest management is essential. There may be a case for linking subsidies to activities with positive externalities, such as soil conservation techniques.

Lack of property rights and institutions to manage common property resources can inflict on-site damage and create negative externalities. There is a glaring need to strengthen individual property rights to land, which will allow the market economy to function correctly. Successful watershed management projects need to be extended. Project design should be sensitive to the creation of community management institutions to address common property resource management problems. Interventions should take the form of providing incentives for the adoption of sustainable resource management techniques. Technologies which can enhance the physical status of common property resources should be encouraged.

To conclude, defining the appropriate role of government will be the cornerstone of the reform programme. The government's appropriate role is to encourage the development of a smoothly-functioning market, through institutional and regulatory reforms that facilitate private sector activities and market efficiency. Where market failure is not an issue, and government inefficiency is clearly evident, the government's role should be drastically reduced. Government spending will have to focus on public goods and market failures, and not on activities better suited to the private sector. In such areas as poverty and environment, the government will continue to play an active role.

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