

Government's Role in Pakistan Agriculture

Major Reforms are Needed

Rashid Faruqee

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Summary findings

Government involvement in Pakistan's agriculture sector has benefited farmers little, contends Faruqee. He recommends reform of agricultural policies and institutions.

For one thing, government policy has severely distorted agricultural incentives — directly, through agricultural pricing policy, and indirectly until recently, through exchange rate policy. Although negative effects of the government's exchange rate policy have been eliminated, the indirect effects from giving certain industries heavier trade protection linger. Input markets have been distorted by subsidies. Those distortions dissipate most of the benefits directed at farmers.

The government's role as an institution-builder also needs reform. Public institutions have proliferated in almost every area of agriculture, with little benefit to the sector. The institutions in research and extension are particularly weak.

In addition, public enterprises have dominated marketing and distribution — crowding out private

sector efforts — although the rationale for a government presence there is not clear.

Moreover, the underpricing of electricity and water has entailed hidden expenditures that make the continued provision of those essential inputs financially unsustainable.

Basic reform is essential, says Faruqee. The proper role of Pakistan's government should be to encourage the development of a smoothly functioning market, through institutional and regulatory reform that facilitates market efficiency and private sector activities. Where market failure is not an issue and government inefficiency is evident, government's role should be drastically reduced.

Government spending should focus on public goods and market failures, not on activities better suited to the private sector. However, the government should continue to play an active role in reducing poverty and protecting the environment.

This paper — a product of the Agriculture Operations Division, South Asia Country Department I — is part of a larger effort in the department to analyze the major issues facing Pakistan's agriculture sector and to suggest a strategy to improve its performance. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Clydina Anbiah, room MC10-376, extension 81275 (35 pages). June 1995.

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Government Role in Pakistan Agriculture:¹

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1. 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' or market failure quite loosely, and the public sector role has been increasing until recently. The public expenditure program and public institutions are the major instruments through which public policies regarding agriculture are implemented. All these combined -- public policy, the public expenditure program, and public enterprises -- determine the nature and extent of the government's role in agriculture.

The purpose of this paper is to review the government's role in agriculture to see whether it has helped or hurt agriculture. The paper has four parts. First, it briefly outlines the major policy objectives of the government in agriculture. Section II looks at how price, trade, and other government policies (such as macroeconomic policies) affect the incentives in, and performance of, the sector. Third, the paper 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 growth of agriculture. Fourth, the paper outlines what changes in government policies and role are needed for an improvement in the performance of the sector.

Policy Objectives in Agriculture

Government papers and documents outline the agricultural policy goals of the government -- goals that have direct impact on the sector. In addition, the government influences sectoral performance by other policies such as macroeconomic policies. Sector-specific policies includes agricultural pricing and marketing policies and so on. Economy-wide policies such as trade and commercial policies have an indirect effect on the sector.

Agricultural policy objectives are generally outlined rather broadly. The key elements of policy goals include obtaining a high agriculture growth rate (in excess of population growth), increasing productivity of the sector, pursuing an export-oriented strategy, conserving and developing natural resources, promoting institutional development, bringing social and economic equity to the agrarian structure, and focusing on small farmers and *barani* (rain-fed) area development. These policy objectives in principle influence government actions and expenditures in agriculture.

It is difficult to judge the stance of policy from such broad objectives. At the level of objective setting, problems can arise since objectives may lead to conflicting policies. For

¹ This paper is based on the World Bank report, Pakistan - A strategy for Sustainable Agricultural Growth ■ (Report No. 13092). The Bank report was prepared by Rashid Faruqee with assistance from Kevin Carey. Moazem Mahmood, Nadeem Ilahi, A. R. Salemi, Tayyeb Shabbir, Derek Byerlee, Omar Nomar, Sarfraz Qureshi, and Yusuf Choudhury prepared background notes, and papers for the Bank report. The authors particularly acknowledge the contributions of Messrs. Sarfraz Qureshi and Tayyeb Shabbir to this paper.

example, high agricultural growth is often combined with food security and the government takes actions to achieve the combined objective. Maintaining a low flour price is a policy that the government pursues to ensure food security, while at the same time the government 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 actual implementation. Supporting small farmers is an example where the stated objective is often not realized. It is therefore essential to focus on the actual implementation of government policy (and not just stated objectives) and, with respect to incentives, to look at the total policy regime -- both sector specific and economy-wide.

II. Price and Trade Policies and their Impact

In Pakistan, all major crops are covered by guaranteed minimum price (GMP) or support price program. The setting of the GMP is, in theory at least, 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 program is designed to combat price falls immediately following harvest, which could force farmers with limited storage to sell at depressed prices. In reality, however, the public sector intervention has little or even negative impact on the welfare of the farmers, as elaborated below.

The designated agencies must purchase all quantities offered to them at the GMP, if the market price falls below the GMP (see box). Funding these purchases is often problematic. Even if the GMP program has helped stabilize domestic prices for some commodities, such as wheat, it has associated costs. Parastatals are not efficient in the handling of crops. They also collude with processors or traders to share the gains from monopolistic market positions.

Box 1

Marketing Arrangements for Major Crops

The Provincial Food Departments and the Pakistan Agricultural Storage and Services Corporation (PASSCO) procure wheat at the support price announced by the government. Procurement is voluntary and in recent years, more and more wheat is being traded in the private sector. However, the government still procures between a quarter and a third of the total crop. There is a subsidy on imported wheat which is then released to flour mills at the subsidized price.

An important feature of wheat policy is pan-territorial pricing. Farmers anywhere in the country receive the same price for their output. This saddles the government with all transport costs from surplus areas to markets. This can also cause distortions in land use.

Private sector exporters are currently allowed to purchase cotton directly from the open market. Both the state Cotton Export Corporation (CEC) and private exporters handle the export of cotton side by side. Private sector traders dominate the domestic trade in cotton. An export duty is imposed to guarantee that raw cotton is available to textile mills.

The Rice Export Corporation of Pakistan (RECP) was established in 1974 to carry out procurement, storage, quality control, and the export of rice. Rice procurement has been voluntary since 1986.

Sugarcane owners sell their product to the mill at predetermined support prices. The millers have a captive market for sugarcane. Sugar prices are kept high through import duties and other controls on imports.

In Pakistan today, distortions by direct marketing and taxing arrangements continue for some crops. Complicated regulations regarding the export of cotton are in place. Anyone can export cotton, but it is subject to a (daily-adjusted) Minimum Export Price (MEP), below which no exports can take place. In addition, a benchmark MEP is set, and a variable export duty is levied on the gap between the MEP and the benchmark price. The variable duty is imposed when international cotton prices rise (as they have recently) to keep cotton in Pakistan for the domestic textile industry. For wheat, the government maintains the farm price below the trade price through subsidized imports.

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, protection to industry adversely affects the price of traded agricultural goods vis-à-vis other traded goods - an effect that operates in addition to the real exchange rate effect. The real exchange rate can be compared to the equilibrium real exchange rate in the absence of trade regime distortions², 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 approach that only takes account of one of the many influences on the real exchange rate (see Box 2).

Table 1: Annual Average Overvaluation
Due to Trade Policy Distortions

	Overvaluation (%)
1972-75	25
1976-79	28
1980-83	25
1984-87	21

Source: Hamid, Nabi, and Nasim, Table 3.2

We assess the effect of policy on agricultural incentives by comparing domestic prices to 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 value-added at parity prices, adjusted for non-price transfers such as subsidies, investment, and taxation.

² Dorosh 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 Pursell and Gulati (1993) for the Indian case. This involves a direct comparison of levels of protection in agriculture and industry. We use this approach later in this section.

Let us first consider the effect of policy distortions on output prices (Table 2). We present the picture from 1960 through to the mid 1980s to provide historical perspective, and we then provide estimates for 1991-92 and 1992-93 to portray the current situation. Historically, agricultural producers have faced very large disincentives. The only major change in the mid-1980s from the historical pattern was a significant fall in protection for sugar, and more modest falls in disprotection for cotton and irri rice. Large nominal disprotection persisted for wheat. More recently, note that there is some protection for coarse rice. Steep rates of disprotection remain for cotton and wheat, and sugarcane remains highly protected.

Box 2

The Exchange Rate and Agricultural Incentives

Since 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 liberalized 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; for instance Hamid, Naji, and Nasim compare the actual real exchange rate to the free trade real exchange rate, which is a rough estimate of the equilibrium exchange rate if tariffs, quotas, and other restrictions were replaced by a free trade regime.

More recent studies (Longmire and Debord, 1993 and Shabbir, 1994) use an approximation to this calculation to update the estimates of overvaluation caused by trade policy distortions. The formula for overvaluation is:

$100 * \{ (M + T_m) + (X - T_x) \} / (M + X) - 1$, where M = value of imports, T_m = Import Duties and Customs minus Import Rebates, X = Value of Exports, and T_x = Export Subsidies minus Export Duties.

Longmire and Debord estimate the overvaluation at 14 percent in 1990-91. We avoid the sole use of exchange rate corrections in our calculations for a number of reasons. First, trade policy is but one influence on the exchange rate. Other factors could lead to the rupee being undervalued, or overvalued. Most notably, if restrictions on capital flows were relaxed, the rupee may appreciate. Second, continued depreciation of the rupee and ongoing trade reform have made trade regime effects much less important in recent years. Finally, these exchange rate calculations do not take account of relative price changes *within* the traded goods sector — which are in practice very important (see later).

**Table 2: 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
Basmati	-38 (-60)	-59 (-69)	-49 (-54)	17 (2)
Cotton	-19 (-46)	-14 (-36)	-48 (-54)	-18 (-29)
Irri	-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 (Table 5.2) for 1960-87 and 1984-87, Longmire and Debord (Table 9) for 1991-92, and Shabbir 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 locations are Gujranwala (wheat and basmati), Multan (cotton), Faisalabad (sugarcane), and Larkana (irri).

Taking Account of Input Prices

The Government recognized 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 in Pakistan (irrigation water and fertilizer) became heavily subsidized. Electricity and pesticides also were subsidized. In the early 1980s, the pesticide subsidy was removed, and the fertilizer subsidy reduced. There is still a subsidy on diesel, electric tubewells, and the purchase of seed. A variety of subsidized credit schemes existed and, to the extent that agriculture uses imported inputs, it benefited from exchange rate overvaluation.

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

³ It shows how the value added by Pakistani farmers at current farm prices (value of tradable outputs minus value of tradable inputs) compares with value added at social (parity) prices. The tradable inputs considered included fertilizer, agro-chemicals, fuel, machinery, seed, and concentrate feed. In 1991-92, both nitrogen and phosphate fertilizer were around 30 percent cheaper at domestic prices rather than world prices. Agro-chemicals were about 10 percent more expensive, as was fuel.

**Table 3. Nominal and Effective
Rates of Protection, 1991-92 Trend Values (Percentage)**

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

Source: Longmire and Debord, Table 11. 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 summarized by the Producer Subsidy Equivalent (PSE), which measures the subsidy to, or from, producers resulting from output and input price policy (Tables 4 and 5). To highlight the role of non-traded inputs in Pakistan, Table 4 presents producer subsidy equivalents and effective rates of protection side by side. Important measured subsidies on non-traded inputs include the lack of complete recovery of operations and maintenance costs on the irrigation system, and interest rate subsidies on loans.

Box 3

Tractor Prices in Pakistan

A World Bank comparison of tractor prices in 16 countries in 1985 found that Pakistan and Turkey had the cheapest tractors in the world (in US dollars, at exchange rates used in import transactions). The price per horsepower was \$136 in Pakistan, compared with just over \$175 in India and Brazil, \$200 in Indonesia and Sudan, \$212 in Mexico and Egypt, and over \$300 in Sub-Saharan Africa.

This is partly because tractors imported into the country as completely knocked down kits were subject to relatively low import charges of 10 percent, and are assembled in a competitive industry, where the markup is officially controlled. In addition, Pakistan is able to obtain the kits from international manufacturers, at very favorable prices.

However, unequal access to credit and mechanization subsidies could mean that the benefits of low tractor prices are not widely distributed. Interest rates on machinery remain significantly lower than parity interest rates, up to 40 percent lower in 1991. While Longmire and Debord show that tractor prices have been slightly above world prices in recent years, it is possible that other countries have decided that even higher tractor prices were desirable to avoid undue increases in farm size and displacement of tenants.

Table 4: Effective Rates of Protection and Producer Subsidy Equivalents for Major Crops, 1991-92 Trend Values

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

Source: Longmire and Debord, Table 16. 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 liberalized its agriculture sector, levels of disprotection for export crops have fallen significantly in recent years. However sugarcane remains highly protected.

However, 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 would 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 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, that net disprotection of agriculture was close to zero in 1991-92. This, however, ignores serious distortions and intersectoral policy bias (see the next subsection) 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. All estimates clearly show that there is significant disprotection for wheat and cotton (inducing a transfer of resources away from those crops), whereas sugarcane is highly protected (attracting resources towards the crop).

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. Considerable 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, in practice, bribes and rent-seeking determine the distribution of water rights (World Bank, 1994). Public procurement has similar abuses. Anecdotal evidence from the field suggests that procurement agents exploit farmers by absorbing most of the difference between the market price and support price when 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, some 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 1987-87, while in 1986-87, manufacturing's effective protection coefficient was 1.34. Taking account of nontraded inputs reduced disprotection of agriculture close to zero, but the protection of manufacturing relative to agriculture is indicative of substantial anti-agricultural bias within the traded goods sector, with consequent misallocation of resources.

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

Table 5: Trade-Weighted Mean All-Inclusive
Import Tax Rates, 1989-90

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 subsectors, 70 percent of domestic resources are employed in inefficient and highly protected industries. This diversion of resources to inefficient sectors (and to rent-seeking) is at the expense of unprotected sectors, including agriculture.

Historically, over a broader range of countries, the effect of protection for other sectors (tradable and non tradable) on agriculture has been relatively high in Pakistan. The effect of trade policy can be quantified by its impact on nominal rates of protection for agriculture (Table 6). The total effect can be disaggregated into direct and indirect efforts. Direct effects measure the percent by which producer prices diverged from prices at free trade (given the actual exchange rate and 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.

In the early 1980s, direct effects were having a small effect on agricultural incentives in both Pakistan and Chile. 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 only losing 7 percent of the world price for the same reason.

So even when measures of incentives within agriculture show protection close to zero, (as the case of Chile shows), most of the disincentive to agriculture can arise from protection given to other sectors (i.e. 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: Kreuger, Schiff, and Valdes (1988).

Pakistan also emerges unfavorably 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).⁴ Thailand's disprotection of agriculture 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 analyzed in the previous section, there were significant revenue transfers from agriculture in the past, although the transfer 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) puts the consensus estimate of the net transfer out of agriculture at between 5 to 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 by input subsidies is a particularly inequitable and inefficient way of raising revenue from agriculture. The output depressing effect of such policy can be even more serious than captured by the price differential between the domestic and import priority price. Most importantly, under such a system, much of the transfer out of agriculture does not accrue to the government, but dissipated as rents. Examples of rent dissipation include corruption in water distribution and excess capacity in the textile and flour milling sectors. Many of the subsidies go to unintended recipients. Clearly, revenue could be generated from agriculture in a far more efficient fashion while pursuing other worthwhile goals. Progressive direct taxes could raise revenue in an efficient manner while facilitating pursuit of

⁴ See World Bank (1993).

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

equity. A land tax could raise revenue and increase the incentive to use land as efficiently as possible.

One should note here that the sectoral classification of tax burden (direct or indirect) is perhaps not the appropriate way of looking at the tax burden; it is more appropriate to assess tax burden by income levels. However, agriculture versus other sectors comparison is still important from the point of view 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 income from any other sources.

Tax Reform Proposals

The interim government of 1993 introduced reforms in agricultural income and wealth tax which have largely been 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 capability 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, and a ceiling at 8,000 embodied in the land holding laws).

The rate is thus low: the maximum tax bill is Rs 10,000 - 2,000 PIUs at Rs 2 and 2,000 PIUs at Rs 3 - or just \$334. The 4,000 PIU 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 themselves 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, then land use is distorted.

An agricultural wealth tax is also 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 farm house, agricultural machinery, farm vehicles, and Rs 100,000 of agricultural land. Tax is then payable at a sliding scale of 0.5% to 2.5% 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 improved price policy and the removal of distortions in input markets. Progressive direct taxes on income and/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.

⁶ Pakistan 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.

Policies Affecting Input Markets

Government policy is also creating constraints in input markets. Timely availability of fertilizer is essential, but phosphate, now being imported by the public sector, is rarely delivered on time, and usually in insufficient quantities, with a resulting 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 import of phosphate is late year after year, the government seems unable to respond to the problem.

Fertilizer policy is imposing large hidden costs on farmers, including search costs for scarce supplies, uncertainty about availability leading to panic buying, and depressed yields through 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 liberalized input market is evident from the extraordinary growth in pesticide use after the subsidy was ended and entry to the market was liberalized. Indeed, widespread pesticide use is widely held to explain the dramatic growth in cotton yields in the 1980s.

Fertilizer pricing policy also has harmful intersectoral effects. Natural gas prices for state run fertilizer corporations in Pakistan are held below prices for other users, with the objective of reducing the price paid by farmers for fertilizer. The problem is that this natural gas 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 use of old varieties of seed could be depressing yields by 15 percent. As in fertilizer, 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 non-existence of breeders' rights and 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.

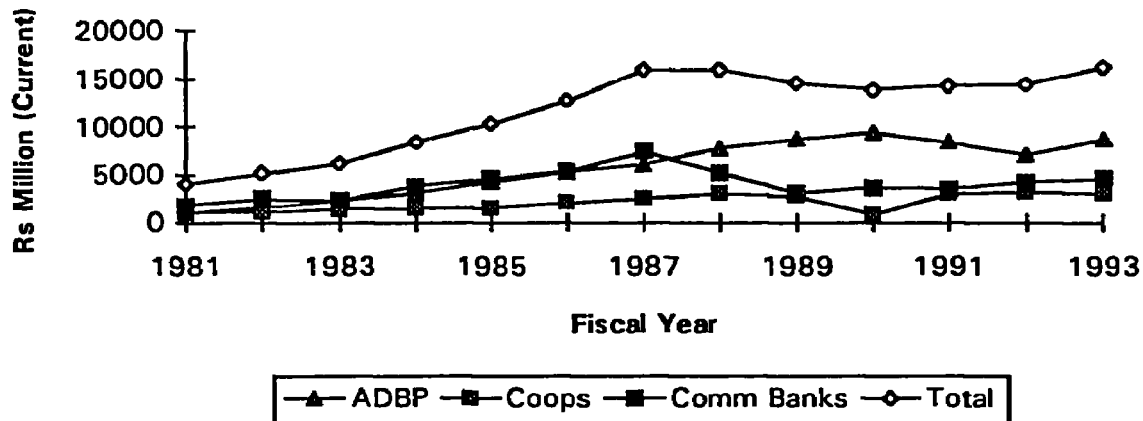
Factor markets have also been distorted by government policy. Apart from tractors (see Box 3), the cost of agricultural mechanization has been further lowered by the access of large farmers to subsidized credit. Research from Pakistan and elsewhere has shown that mechanization has far greater labor-displacing than output enhancing effects. While some mechanization was inevitable, policy induced lowering of tractor prices led to premature tractorization and labor 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. Export horticulture, a likely source of future growth, requires substantial investment, both short-term and long-term, which the present financial system is incapable of meeting. Land mortgages are usually not sufficient to cover loan requirements, and the specialized nature of horticulture equipment lowers its value as security in the event of default.

Figure 1 shows the formal agricultural credit disbursed since 1981 by the major lenders to the sector.

Figure 1: Credit Disbursement



Lending by all agencies increased until 1987, and by the Agricultural Development Bank of Pakistan (ADBP) until 1990, followed by stagnation. That, and the recent bailout of agricultural cooperatives by the government are all signs of serious problems in the rural financial system in Pakistan.

The formal credit sector lacks dynamism. Two institutions (ADBP, and the Federal Bank for Cooperatives) comprise virtually the entire formal sector. Both have failed to mobilize deposits, and rely on transfers to maintain lending capability. 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 mobilize 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. 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, so, many non-performing loans. Attempts at recovery can take years. Almost 30 percent of the US\$100 million that farmers spend on tractors each year comes from loans that eventually turn bad. 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. Amongst small farmers, credit access has increased much faster for owners and owners-cum-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

capability to assess or price these risks, and would likely constrain lending even if the use of crops as collateral was permitted.

Informal finance, which is estimated to account for 70-80 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. Noninstitutional 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 - over 50 percent in one village in Sindh. While this would include some projects that would not be viable at any positive rate of return, it also includes some projects with long gestation lags, or projects that would be viable from society's perspective 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 also finds that market equilibrium involves many lenders, each making a few small loans. Thus the average cost per loan is high, reflected in informal sector interest rates.

Sources of the Problems: 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 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 nonexistent. 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 is also high.

Second, and more important, farmer's 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 50 percent of the total demand for credit of a typical farmer in his sample.

Since liquidity needs are correlated across space and time, banks need to be allowed to intermediate in different markets. This creates an inherent tension: while information about projects resides at the local level, which would suggest the usefulness of specialized credit provision, such a specialized provider would be unable to diversify to meet insurance and liquidity needs. 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 to boost investment in the sector.

III. 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 -- as is the consensus among development economists and policy analysts -- 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 (Box 4).

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 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.

Box 4

The Case for Government Intervention

The 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. Specifically, the public sector should have a key role in growth-enhancing public goods, mainly in agricultural research, extension, public health, and rural infrastructure, while correcting environmental externalities associated with forestry, soil conservation, and integrated pest management. There is also a role for maintaining basic infrastructure and providing a framework for generating, developing, adapting, and disseminating appropriate production technologies.

Externalities present a strong case for government intervention - but not always government ownership. Government regulation or taxation may be necessary for optimal use of a product or service. Moral hazard problems arise where the quality of a product cannot be explicitly evaluated, creating incentives for producers to supply substandard quantities. Where the substandard product can have harmful side effects (for example, pesticides), this problem is particularly serious. The government may also need to intervene to regulate (but of course not control) natural monopolies or oligopolies. Finally, the government may have a role in infant industries, where economies of scale or a high degree of uncertainty make the private sector reluctant to enter.

Institutions and Services

Public institutions have proliferated and the provision of most major services has a significant public sector presence (see Table 7). Their activities range from input supply, infrastructure provision, regulation, resource mobilization, and output price intervention, across federal and provincial levels of government. The broad range of activities in Table 8 clearly goes beyond what would be considered legitimate areas for intervention. The table also indicates the likelihood of considerable inefficiency and duplication of functions between 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 fertilizer 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 fertilizer 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 have cotton institutes. 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 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 programs between the Ministries of Agriculture and Water.

Table 7: AGRICULTURAL INSTITUTIONS

<u>Activity/commodity</u>	<u>Federal</u>	<u>Punjab</u>	<u>NWFP</u>	<u>Sindh</u>	<u>Balochistan</u>
INPUTS					
Land		BOR	BOR	BOR	BOR
Fertilizer	MINFAC(FID) NFC/NFML	PAD(PADSC)	PAD(ADA)	PAD(SASO)	PAD
Seed	MINFAC(FSCD)	PAD(PSC)/	PAD(ADA)	PAD(SASO)	PAD
Water	MOW&P MINFAC(FMWC) PAD(OFWMD) PCD(PCBS) FBC/NCBs	PID PAD(OFWMD) Credit PCD(PCBS)	PID PAD(OFWML) SBD/ADBP/	PID PAD(OFWMD) PCD(PCDS)	PID PCD(PCDS)
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) (AZRI) (PCCC)/KARINA	PARB/AUF/ ARIS	AUP/ ARIS	SARD/SAU/ ARIS	BARB/ARIS
Training					
Irrigation	MIRIS (IWARSI)(DRIP)	PIRI			
Forestry	MINFAC(PDI)	FSS	FSS	FSS	FSS
INFRASTRUCTURE					
Electricity	MOW&P/WAPDA				
FTM Roads	MLG&RD	LG&RDD	LG&RDD	LG&RDD	LG&RDD
Minor Irrig.	MOW&P	PID	PID	PID	PID
REGULATION/INTERVENTIONS					
Prices	AFCOM				
Irrigation	WAPDA	PID	PID	PID	PID
Seed Certif.	MINFAC(FSCD)				
Electricity	WAPDA				
Quality control	Food & Drug Insp.				
Environment	PEPA	EPA	EPA	EPA	EPA
RESOURCE MOBILIZATION					
Land Revenue	Collector	Collector	Collector	Collector	Collector
Ushr	Collector	Collector	Collector	Collector	Collector
Octroi	DC	DC	DC	DC	DC
Abiana/Drainage Cess	Collector	Collector	Collector	Collector	
AG. STATISTICS	MINIAC(CH)	CRD	PAD(SDIR)	PAD(DSIR)	PAD
AG. CENSUS	SD(PACO)				
OUTPUTS					
Procurement	PASSCO/RECP GOP/CEC	PDF	PDF	PDF	PDF

ABBREVIATIONS

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

SAU	Sindh Agricultural University
SBP	State Bank of Pakistan
SCD	Soil Conservation Directorate
SD	Statistics Division
SDIR	Statistics Directorate
SRPO	Sindh Regional Planning Organization
SSC	Sindh Seed Corporation
WAPDA	Water and Power Development Authority

Property rights in agriculture are monitored by land management institutions, which operate at the provincial level. The land records system is cumbersome and outdated (Box 5). A streamlining of the system is a pre-requisite for smooth functioning of the land market.

Box 5

Land Management and Records System

Provincial Boards of Revenue (BoR) handle property rights and tiling of land, and also settle land disputes. At the farmer level, the system is administered by the *Patwari*. The chain between the BoR and the *patwari* has become more complicated over time. The *patwari* maintains 12 different types of (hand-written) land records, prepares three daily reports, maintains at least six different registers, and updates a "Red Book", which in principle is a detailed survey of every farm in the district. The system vests considerable power in the *patwari*, who must be approached every time a piece of land is to be transferred or some property right is required to be established. This power is clearly open to abuse.

The use of computers could in principle facilitate record maintenance and ensure immediate access to land records and agricultural data. However, institutional deficiencies also preclude the operation of a normal land market. Most important is the absence of permanent title deeds establishing land ownership.

The *patwari* is also a primary data source, but his multifarious role opens data collection and gathering to various biases. More generally, crop production data are subject to ongoing trial and error revisions, which makes agricultural policy and strategy formulation very difficult.

Environmental protection agencies, at both the federal and provincial level, still suffer from lack of trained manpower and have taken a long time to become functional. For example, the Pakistan Environmental Protection Council (PEPC) 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 still very weak, and coordination among the provinces is non-existent. Regulatory bodies, such as 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, is the weakness and inadequacies in public sector institutions more evident than in the areas of research and extension. In fact, deficiencies in research and extension have been highlighted as a factor explaining lower productivity growth in Pakistan compared to 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 increased in India after 1975, while falling in Pakistan.

Research: There is a lack of funding in general for research and operational funds in particular. The effectiveness of research has declined because of lack of material support, effective planning, monitoring, and evaluation of the research program. Researchers lack the proper equipment and journals (notably foreign journals), leading to a very poor research environment. There is an apparent proliferation of research institutes (universities, PARC, NARC, provincial research and monocrop institutes), often with overlapping responsibility and duplication of research.

Agricultural research broadly covers two areas -- plant breeding research and crop and resource management research (CRMR). Plant breeding research has been satisfactory, although the lag in getting research to farmers is often long. In wheat, the average age of varieties in farmers' fields is about 11 years, compared to an average of about 7 years for 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 realized if some breeding institutes at different levels of government were consolidated.

Crop management research emphasizes increases in productivity through research on such issues as timing and method of application of input rather than type of input, and land preparation and harvesting. Resource management research focuses on preservation of the natural resource base. For most crops in Pakistan, it is difficult to find good examples of CRMR which have been translated to farmers' fields. Much evidence indicates that key inputs such as water and fertilizer are inefficiently used.

Existing 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. Specialized 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 commercialized and sustainability issues come to the fore. Extension thus has a central role in improving productivity growth, and also in making the distribution of benefits from knowledge more equitable. Small farmers may find it more expensive to acquire knowledge, and so public extension has a role in equalizing access to new methods.

Extension programs are a significant item in the current agricultural budget of the government but their impact is negligible. An elaborate extension system is already in place for crops, but many farmers question its usefulness. Organizational 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 60:40⁷, but the prevailing ratios in many of the provinces are in excess of 80:20. For instance, in 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 (EWs) but they often lack adequate training, which makes their task of improving the management skills of farmers very difficult.

⁷ Pakistan Public Expenditure Review, World Bank, 1992.

Extension workers with higher education and communication skills are often likely to be assigned administrative responsibilities. The system is characterized 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 modest success. Measures of farmer contact do show an increase, and extension services may have had impact on increasing pesticide use. However, Husain et al (1994) could find little evidence that T&V had improved the *quality* of extension advice. An increase in extension contact does not necessarily show that extension has aided growth. In addition, contact is highly skewed towards large farmers. A survey of extension contact in Punjab in 1986⁸ showed that 60 percent of farmers with over 10 hectares of land had contact with the extension service in the previous year, whereas only 24 percent of farmers with 5 to 10 hectares had contact over the same period.

Moreover, some success of the T&V system can be explained by the poor state of extension service before the system was introduced. By introducing organizational 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 centralized, hierarchical approach that limits feedback and adaptability to local conditions.

The quality of extension services does not compare favorably with India. Husain et al (1994)⁹ find that although the Training and Visit system has increased the quantity of extension advice (visits, messages etc.), it does not appear to have increased farmers technical knowledge or the rate of adoption of new technology. This contrasts with evidence from a comparable region of 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 tradeoffs 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 fertilizers. We have

⁸ Byerlee (1994).

⁹ Cited in Byerlee (1994).

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 fertilizer 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.

Table 8
PAKISTAN: PUBLIC EXPENDITURE IN AGRICULTURE
(Current)
Constant Rupees - millions

	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	260.19	299.34	306.35	331.97	261.15	383.08	254.05	333.18	344.49	377.88	366.18	378.32	4.13
Irr. & Land Reclam.	876.10	949.19	1039.23	1101.56	150.54	738.94	973.76	908.47	930.86	1252.12	1070.57	1302.07	4.42
Total Punjab	1340.26	1505.32	1615.08	1756.00	1872.56	1512.23	1598.90	1579.52	1632.63	1990.69	1804.39	2047.12	4.79
Sindh													
Crop Agriculture	88.21	122.89	109.14	127.14	134.31	144.52	140.20	157.79	166.83	185.25	156.02	153.63	6.74
Irrigation	264.78	304.17	329.89	353.50	394.84	405.46	411.71	373.90	352.54	355.49	358.87	343.55	2.70
Total Sindh	430.76	509.28	529.28	578.28	639.38	658.19	659.09	642.65	650.72	676.27	656.57	637.25	4.36
NWFP													
Crop Agriculture	70.51	85.66	114.41	115.60	120.35	120.81	113.41	106.28	106.82	116.40	122.13	130.13	7.69
Irrigation	94.76	108.55	129.00	147.65	222.00	216.08	244.95	235.87	238.70	237.77	253.06	234.87	13.34
Total NWFP	216.49	270.18	306.41	348.74	424.70	426.28	450.86	429.22	447.88	460.02	477.07	474.98	10.85
Balochistan													
Crop Agriculture	56.63	65.98	73.29	82.08	95.00	104.70	107.75	103.95	100.09	119.25	135.40	143.44	13.93
Irrigation	71.21	65.53	66.41	88.81	84.72	73.38	76.97	68.36	60.01	73.19	73.52	76.13	0.63
Total Balochistan	167.66	177.38	192.85	228.15	251.98	253.92	254.89	242.36	244.16	287.68	299.18	314.75	7.98
Federal Government													
Subsidies	na	na	2744.00	1318.00	112.00	236.00	4751.00	2501.00	2229.00	1914.00	978.00	492.00	na
Wheat & Sugar Subsidy	na	na	1039.00	1318.00	112.00	236.00	3076.00	1852.00	1179.00	1830.00	978.00	492.00	-0.73
Edible Oil Subsidy	na	1179.00	1704.55	0.00	0.00	122.00	1675.00	649.00	1050.00	84.34	0.00	0.00	-10.00
Total Federal	145.51	109.46	2917.00	1497.60	312.58	413.47	4919.00	2670.00	2393.00	2085.00	1196.00	662.39	-0.80
Total National Current Expenditures	2300.68	2571.68	6708.83	5900.06	5337.21	5542.17	9092.15	5563.47	6343.60	6320.94	5310.15	5099.47	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 and actual data could be considerably different. 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. Other subsectors are not shown individually, but are included in the total figures.

Table 9

PAKISTAN: PUBLIC EXPENDITURE IN AGRICULTURE
(Development) Total
Constant Rupees - million

	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	215.92	211.79	184.16	225.38	226.99	273.86	124.76	135.57	157.18	138.77	171.28	70.58	187.79	-3.95
Irrigation	424.67	288.29	322.24	272.59	402.51	350.38	182.13	237.11	595.62	545.90	410.55	186.77	366.54	-1.47
Total Punjab	<u>785.22</u>	<u>611.87</u>	<u>624.22</u>	<u>601.74</u>	<u>752.10</u>	<u>739.76</u>	<u>398.90</u>	<u>460.78</u>	<u>837.98</u>	<u>762.73</u>	<u>649.51</u>	<u>309.04</u>	<u>656.86</u>	<u>-1.15</u>
Sindh														
Agri and Agri Credit	88.85	64.37	71.79	76.51	97.66	138.05	78.58	73.58	89.70	50.88	59.22	48.08	80.83	
Irrigation	193.57	172.17	189.74	193.97	284.91	262.34	181.10	255.91	313.04	273.46	238.53	228.31	232.61	2.51
Total Sindh	<u>307.65</u>	<u>269.63</u>	<u>298.38</u>	<u>330.60</u>	<u>440.61</u>	<u>458.91</u>	<u>322.86</u>	<u>393.96</u>	<u>490.66</u>	<u>372.60</u>	<u>359.23</u>	<u>324.84</u>	<u>367.74</u>	<u>3.89</u>
NWFP														
Agriculture	40.24	48.08	48.43	47.05	58.77	72.21	90.19	164.71	58.26	142.40	56.64	64.78	75.23	3.41
Irrigation	34.22	50.48	55.52	51.82	64.16	92.37	60.92	105.39	124.50	145.22	189.46	172.00	88.64	29.70
Total NWFP	<u>118.91</u>	<u>126.84</u>	<u>128.14</u>	<u>124.45</u>	<u>152.04</u>	<u>192.47</u>	<u>197.49</u>	<u>316.81</u>	<u>227.45</u>	<u>338.85</u>	<u>302.08</u>	<u>311.57</u>	<u>202.32</u>	<u>14.96</u>
Balochistan														
Crop Agriculture	59.91	53.62	56.56	43.15	56.51	41.01	42.45	41.33	60.24	24.16	41.56	56.23	47.32	-1.26
Irrigation	118.50	122.54	100.83	186.52	156.37	154.57	177.55	166.12	199.44	368.59	415.75	243.52	196.96	15.77
Total Balochistan	<u>243.70</u>	<u>237.71</u>	<u>221.90</u>	<u>296.59</u>	<u>276.03</u>	<u>240.55</u>	<u>263.49</u>	<u>246.32</u>	<u>280.49</u>	<u>423.04</u>	<u>491.35</u>	<u>360.37</u>	<u>292.83</u>	<u>5.70</u>
Federal Government														
Food & Agriculture	1879.07	1713.52	1551.57	2349.41	1579.56	1337.06	1181.60	1163.87	809.71	1130.17	711.68	479.31	1400.66	-6.08
Irrigation	873.31	894.11	544.85	867.91	1011.44	608.18	363.68	920.79	775.46	312.07	334.15	507.59	682.36	-4.76
Food Storage	219.58	118.76	175.74	47.64	69.83	29.92	3.31	50.94	31.82	5.28	0.00	0.00	71.17	-9.09
Federal Subsidies														
Fertilizer Subsidy	1623.00	1220.00	1137.12	1766.69	788.77	1389.24	1428.66	674.84	678.41	1224.00	333.33	309.00	1045.31	-0.96
Tubewell Subsidy	2.00	13.33	13.33	11.74	12.59	6.40	4.71	4.42	na	0.00	0.00	na	na	na
Total Federal	<u>4603.69</u>	<u>4129.90</u>	<u>3665.17</u>	<u>5240.43</u>	<u>3665.15</u>	<u>3621.40</u>	<u>3149.95</u>	<u>2941.16</u>	<u>2421.95</u>	<u>2791.05</u>	<u>1731.97</u>	<u>1448.19</u>	<u>3284.17</u>	<u>-2.47</u>
Total National Dev. Expenditures	<u>6062.00</u>	<u>5389.00</u>	<u>4951.00</u>	<u>6605.55</u>	<u>5298.52</u>	<u>5259.56</u>	<u>4337.40</u>	<u>4363.41</u>	<u>4258.52</u>	<u>4688.27</u>	<u>3534.13</u>	<u>2954.02</u>	<u>4977.05</u>	<u>-3.69</u>
Total National Agri. Expenditures	<u>8362.00</u>	<u>7960.95</u>	<u>11660.57</u>	<u>12512.32</u>	<u>10635.73</u>	<u>10801.73</u>	<u>13429.55</u>	<u>9926.91</u>	<u>10602.12</u>	<u>11009.20</u>	<u>8844.28</u>	<u>7853.49</u>	<u>10229.94</u>	<u>-0.57</u>

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 periods, except for National Expenditure growth, which is calculated from a regression trend line on a two-period moving average. Other subsectors like fisheries, veterinary etc. are not shown individually but are included in the total figures.

Subsidies are in fact a major component of the overall expenditure program. The ratio of current subsidy to current expenditure for the provincial governments, over the past 12 years, has varied from 19 percent to 44 percent. 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 have also been high, from 24-83 percent of development expenditure. Subsidies have fallen to some extent in recent years, both absolutely and relative to total expenditure (Tables 10 and 11).

Table 10
Provincial/Federal Expenditure and Subsidy
(in constant Rupees - Million)

Year	Provincial Expend (Total)	Provincial Subsidy	Subsidy/Expend	Federal Expend (Total)	Federal Subsidy	Subsidy/Expend
<u>CURRENT</u>						
82-83	2155	na	na	na	na	na
83-84	2462	na	na	na	na	na
84-85	3792	1149	0.30	2917	2744	0.94
85-86	4409	1498	0.40	1498	1318	0.88
86-87	5025	1836	0.37	313	112	0.36
87-88	5129	2278	0.44	535	358	0.67
88-89	4173	1209	0.30	4919	4755	0.97
89-90	2894	na	na	3319	3150	0.94
90-91	3950	975	0.25	2393	2229	0.93
91-92	4236	821	0.19	2085	1914	0.92
92-93	4114	877	0.21	1196	978	0.82
93-94 ¹⁰	3474	963	0.28	540	492	0.91
<u>DEVELOPMENT</u>						
82-83	1458	2	.00	4604	1625	0.35
83-84	1259	13	.01	4130	1233	0.30
84-85	1286	13	.01	3665	1151	0.31
85-86	1365	12	.01	5240	1778	0.34
86-87	1633	13	.01	3665	801	0.22
87-88	1638	6	.00	3621	1396	0.38
88-89	1187	5	.00	3150	1433	0.45
89-90	1422	4	.00	2941	652	0.22
90-91	1837	0	0	2422	678	0.28
91-92	1897	0	0	2791	1224	0.44
92-93	1802	0	0	1732	333	0.19
93-94	1306	0	0	1139	309	0.27

Source: Tables 8 and 9.

¹⁰ The 1993-94 figures in Tables 4.4 and 4.5 are Budget figures, and thus subject to major revision.

Current subsidies for food procurement and price stabilization have been the government's cornerstone for food autarky. This policy has reduced the domestic price and production variance: the standard deviation of wheat production has been less than 8 percent of the mean in 1978-1987 (Pinckney, 1989). Moreover, the government has insulated consumers from major swings in wheat prices through 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 have been below 10 percent of production per year.

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

Year	Total Subsidy	Total Current Expenditure	Subsidy as % Current Expenditure	Subsidy as % Agriculture GDP
82-83	na	2301	na	na
83-84	na	2572	na	na
84-85	3893	6709	58	4.42
85-86	2816	5907	48	3.00
86-87	1948	5337	37	2.01
87-88	2514	5542	45	2.53
88-89	5960	9092	66	5.63
89-90	2501	5563	45	2.29
90-91	3204	6344	51	2.80
91-92	2735	6321	43	2.18
92-93	1855	5310	35	1.54
93-94	1764	5408	33	1.45

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 had 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 program of open market operation – buying post harvest stock and releasing it later at a pre-determined fixed margin over 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 government has also controlled international trade of wheat by prohibiting exports, and importing irregularly to replenish domestic stocks. Thus, domestic prices of wheat have been lower than import parity prices. Meeting this price differential, along with the cost of storage and maintaining buffer stocks, has been a heavy fiscal drain for the government. The cost of maintaining food subsidies has been high, ranging up to 66 percent of current expenditure (Table 11).

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 flour¹¹, so the effect on the retail price of flour of the subsidy is minimal.

Food security is best ensured by raising the real income of households and control of 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. Subsidies on such essential factors as fertilizer and seeds distort input markets. Moreover, government activities in procurement, distribution and marketing of inputs are almost always inefficient and unresponsive to the needs of buyers. For example, the cost of fertilizer distributed by government agencies in Pakistan has been much higher than the private sector, and this inefficiency loss is borne by the public exchequer. Public seed corporations have not been effective either. Most of these corporations have been running at a loss, as shown later. The farmers have been deprived of the benefits of competitively driven prices and an active commercial market.

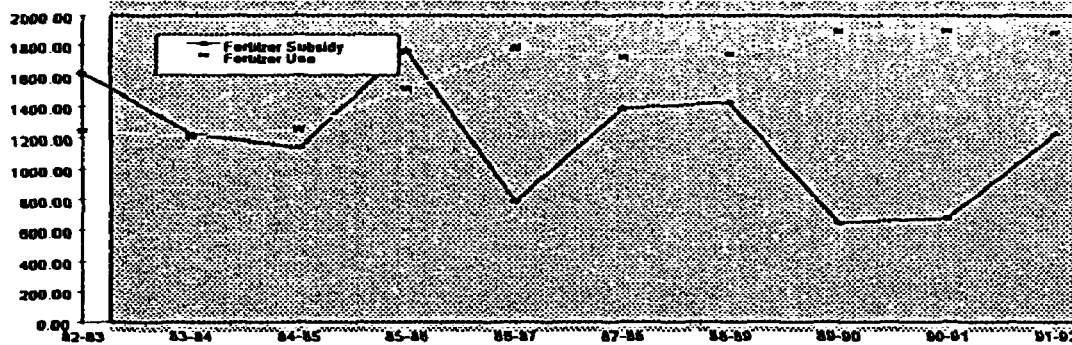
Cheap inputs (in the short run) also encourage waste through overuse, particularly by poor farmers not well versed in agronomy. Fertilizer and seed subsidies are essentially regressive since they benefit mostly the larger farmers that use large amount of the subsidized inputs. Also, the administration of the subsidy program encourages rent-seeking. In the past, farmers have received interest-free short term loans, as well as low interest medium - and long-term loans from the nationalized financial institutions. Some loans are not repaid, which implies an additional (unintended) subsidy. Subsidized credit must be rationed, and unequal access to land and power almost guarantee that large farmers will obtain most of the subsidy. 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 fertilizer subsidy boosted fertilizer 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 fertilizer subsidy and use of fertilizer - the correlation being -0.51 (Figure 2).¹² Fertilizer usage rates are apparently not affected by the subsidy. Perhaps in recognition of this, fertilizer subsidies are being cut and are expected to be phased out completely by 1995.

¹¹ The import parity price of flour is computed as the import parity price of wheat plus milling and distribution charges.

¹² Pearson correlation coefficient between subsidy and fertilizer consumption.

Figure 2
Fertilizer Subsidy and Consumption in Pakistan



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

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 for water than the current price. This underpricing has led to inefficient overuse of water, deterioration in the system resulting from the squeeze on 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 also considerable. However, as the current power crisis in Pakistan shows, this subsidy is of dubious benefit to farmers. Rural areas can be without power for up to 12 hours per day. Capital expenditure on electricity generation has been crowded out by the low rate of cost recovery.

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), then 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 operations and maintenance expenditure on the irrigation system, which has consequently deteriorated (Table 12). The shortfall varies by province, and is as high as 37 percent in Sind, and stems from low water rates and inadequate assessment and collection of charges.¹³ In addition, revenue does not go directly to the Provincial Irrigation Departments, which creates poor collection incentives.

¹³ Moreover, the required levels did not include public tubewells, on the assumption that these would be privatized. But privatization of groundwater tubewells is slower than planned, and the O&M needs of these tubewells has been considerable.

Table 12: O&M Expenditure and Requirements
(in Million Current Ruppes)

Fiscal Year	1988	1989	1990	1991	1992
Requirements	1704	1875	2161	2408	2617
Expenditure	1704	1513	1617	1718	1985
Shortfall(%)	0	-19	-25	-29	-24

Source: World Bank (1994)

Rural infrastructure deficiencies have also been widely documented. Witness the road density in Pakistani Punjab, which is just one half of the road density in Indian Punjab. 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, 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 the farmer's against private 'exploitation'. Notable among these agencies are the Punjab Seed Corporation (PSC), the Sind Agricultural Services Organization (SASO), Punjab Agricultural Development and Supplies Corporation (PADSC) Pakistan Agricultural Services and Storage Corporation (PASSCO), Agriculture Development Authority (ADA), Cotton Export Corporation (CEC), and Rice Export Corporation of Pakistan (RECP). 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 RECP. Table 13 summarizes the operating profit and losses of four major agriculture sector corporations in Pakistan.

Table 13
Consolidated Profit & Loss of Major Public Corporations
in the Agriculture Sector
(in Million Current Rupees)

	1988	1989	1990	1991	1992	1993	1994
PSC	(2.58)	(0.97)	15.14	9.75	18.79	26.75	-
SASO	-	(10.01)	(42.37)	(50.84)	(40.82)	(58.77)	-
PADSC	-	-	-	-	-	(13.36)	16.04
PASSCO	-	-	(169.25)	79.87	85.96	55.80	(89.39)

The case of the Punjab Seed Corporation (PSC) is typical. Audited accounts of the PSC for the past six years show that the company had losses in the early years, but turned around later on. On the surface, this corporation does not seem to have done too badly in the recent years. However, certain expenditure items have not been taken into account, whose inclusion would in all probability 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 nationalized banks have been underwritten by the government at around 12.5 percent, which amounts to an indirect subsidy. Third, the corporation had borrowed working capital of Rs.50 million from the Government of Punjab, but has not paid the interest on this loan. Fourth, the corporation receives occasional grants from the Government of Punjab for expansion of facilities.

Sind Agricultural Supplies Corporation distributes fertilizer and seeds to farmers in Sind. The corporation receives reimbursement of the distribution costs on a predetermined formula, which is not sufficient. As a result, the organization has had operating losses in all the years for which data was available (1989-93).

Available data for the Punjab Agricultural Development and Supplies Corporation also show net operating losses. The positive profit shown for 1993-194 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 3 billion rupees. The operating finances of this organization shows 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 characterized by market failure is extremely tenuous. A review of marketing institutions by the World Bank in 1990¹⁴ has indicated that problems can generally arise with parastatal marketing in developing countries, some of which 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, fertilizer and seed are heavily subsidized and

¹⁴ Agricultural Marketing: The World Bank Experience, 1974-85 (1990), Operations Evaluation Department, The World Bank, Washington. D. C.

the state organizations (PSC, PADSC, SASO, and so on) have difficulty in realizing their full operational costs from the consumers. The prices set by the government are also imposed on the private sector, either through administered prices or by the presence of government marketing agencies. This has resulted in inefficiency of supply, such as untimely availability, poor distribution in low demand areas, and so on.

Second, for large parastatals, the cost of inefficient operation is reflected both in the price and the level of service. There is evidence that private sector prices have been less than state enterprises in many instances of distribution of fertilizer and seeds. Parastatals have a poor record of cost control, because they usually practice "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 are often preferred by them. This seriously calls into question the argument that expansion of public-sector marketing services is needed to check alleged exploitation by merchants. So, there is no justification for the public sector role in marketing. 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.

To conclude this section, the implication is that the large public-sector role in input marketing, storage, supplies, and similar functions will have to be cut, freeing resources for other needed areas, while reducing crowding out of the private sector in these activities. The public-sector's role has risen unnecessarily and the need is now for "less, but better government". The continued presence of subsidies and regulations propping up state enterprises slows market development and impedes the transmission of prices to agricultural producers (through inefficiencies, corruption in procurement, and so on).

There are some areas where an increased role for government is necessary, specifically to strengthen market institutions. There is a glaring need to strengthen individual property rights to land, which will allow the market economy to function correctly. Another key issue of institutional development is to decentralize agricultural support services - such as rural credit, water user groups, and farmer groups.

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

IV. Needed Reforms ¹⁵

Price and Trade Policy: In keeping with structural reforms, output prices need to be transmitted to farmers with least distortion. Price supports and controls, which cause distortions in market signals and huge fiscal costs, need to be phased out. The government aim of reducing inter- and intra- year 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

¹⁵ See WPS1407 for further details of the needed reforms.

consider ending the subsidy on wheat imports. The government will need to ensure that there are no import restrictions on wheat and flour. It would be desirable to remove protection of sugarcane through high support prices and sugar import restrictions, allowing diversion of scarce resources (such as water and land) to more efficient uses.

Trade reform will have to be completed speedily. In particular, taxes on cotton exports, duties on sugar imports, and 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 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 fertilizer 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 which will require careful consideration. However, some immediate measures would be highly desirable to correct land market distortions, which include low machinery prices (often effectively zero through the use of delinquent loans to buy machinery), and unequal access to credit (which makes it difficult for small farmers to expand their holdings). These reforms would increase opportunities available for farming, and for wage labor on employment-intensive farms. The land title process can be modernized and streamlined, including the establishment of a system of permanent title deeds to land. Security of tenure shall be assured, 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 pre-requisite for this is full economic pricing of water & mechanized inputs. With water charges currently so low, there is little incentive to use the water rights, attached to land in 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 greatly improve.

It will 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 setup costs of credit. Such assistance would be one-time and reduce the transaction costs, and the best option is not to have any recurrent subsidy. Credit reforms are essential to increase investment in the sector.

Institutional Reforms: 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. By most measures of productivity, Pakistan's institutions have not evolved to meet this challenge.

Irrigation should undergo a demand-based decentralization, through the development of water user associations (WUAs) at distributary level. These WUAs would be participatory farmer organizations 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 (Pus), and explicit contractual obligations would exist between the Pus

and the WUAs. At provincial level, autonomous water authorities would be responsible for major provincial storages, link canals, off-farm and provincial drains, and flood control and management.

Irrigation charges can be raised to reflect the cost of provision, the quality of service provided, and the cost of competing alternatives. Disputes between the 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.

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 will allow water to go to its most efficient user via the sale of water rights.

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 will be made more autonomous, salary restrictions lifted, and other funding sources mobilized. Greater importance should be attached to research in cropping systems. Publicly funded research will 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 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 (which would be a part of the extension service, outlined next) would provide site- and season-specific recommendations and information to adapt them to each farmer's needs. Incentives could be provided for greater participation of farmers in defining research priorities.

With no-one 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 amongst 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 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 major crops. It will be desirable to have a more diversified approach to extension -- one that responds to varying needs of farmers, and uses various available sources of extension services, including the private sector.

Some extension is already being undertaken by the private sector companies. These and NGOs could be encouraged to increase the provision of extension services. A system of advisory services by adaptive research institutions to medium and large farmers on payment of fees could be encouraged.

The government's role in rural infrastructure provision needs to be strengthened. Increased revenue from the tax reforms and savings from the rationalization 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 on natural resource management problems in agriculture is required. policy interventions for natural resource management and the environment will be based on three principles (a) Price adjustments for scarce natural resources in order to provide appropriate conservation incentives (b) identifying regulatory mechanisms which could be effective in addressing market failure, bearing in mind the poor record of existing regulatory agencies and (c) restructuring public expenditures to focus on natural resource management priorities.

In environment and natural resource management, market failure is more likely to be a problem. Many market failures, such as the excessive application of harmful pesticides, will require public regulation. Increased pesticide use has created 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. 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. Great interventions should take the form of providing incentives for the adoption of sustainable resource management techniques. New technologies which can enhance the physical status of common property resources are encouraged.

To conclude, defining the appropriate role for government will be the cornerstone of the reform program. 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, government's role will 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 poverty and the environment, the government will continue to have an active role.

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