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CAPSA Monograph No. 50

Proceedings of the Regional Meeting

**Towards a Joint Regional Agenda
for the Alleviation of Poverty
through Agriculture and
Secondary Crop Development
Bangkok, 21-22 November 2007**

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Country Status Paper – Pakistan*

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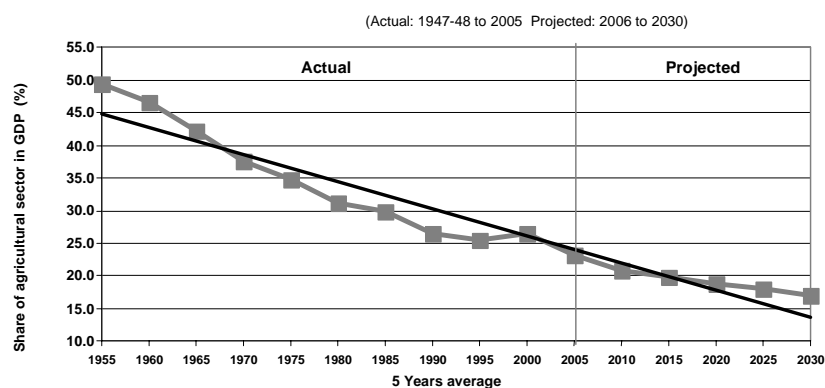
Introduction

Pakistan is the tenth largest country in the world with a population of approximately 150 million. It lies in South West Asia with the Pamir Plateau to the north and Arabian Sea to the South. The whole of the country lies approximately between latitude 23.5° North and 40° North and longitude 60° East and 80° East. It is classified as a middle-income developing country with 22 per cent of total households living below the absolute poverty line. The vast majority of the population (70 per cent) lives in rural areas and is mainly dependent on agricultural activities for its livelihood.

Agriculture has always been the most important sector of Pakistan's economy. At the time of independence in 1947, the agricultural sector accounted for 52 per cent of GDP. In 1987, this sector accounted for 26 per cent of GDP and 67 per cent of the export earnings. The sector has maintained an annual growth rate of 4.4 per cent. However, like everywhere in the world, the share of the agricultural sector in GDP is declining in Pakistan. The graph below shows that during 2005-2006 agriculture accounted for 23.1 per cent of GDP. Economists have projected further declines as shown in the graph.

* Paper presented at the Regional Meeting on "Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development", Bangkok, 21-22 November 2007.

** Pakistan Agricultural Research Council, Islamabad, Pakistan (<http://www.parc.gov.pk/>).

Figure 1. Share of agricultural sector in GDP

Source: Federal Bureau of Statistics, Projection based on regression analysis of 26 year data (1980-05) by using Chiang method and further extrapolated through compound growth method ($P_n = P_i(1+r)^n$).

Major crops

The major crops and fruits grown are:

- | | | |
|---------------------------|----------------|----------------|
| 1. Wheat | 10. Sugar-beet | 19. Vegetables |
| 2. Rice | 11. Pulses | 20. Citrus |
| 3. Cotton | 12. Ground-nut | 21. Mango |
| 4. Maize | 13. Sunflower | 22. Banana |
| 5. Sugar cane | 14. Onion | 23. Apple |
| 6. <i>Bajra</i> (Millet) | 15. Ginger | 24. Apricot |
| 7. <i>Jawar</i> (Sorghum) | 16. Chillies | 25. Pears |
| 8. Barley | 17. Potato | 26. Dates |
| 9. Tobacco | 18. Tomato | 27. Grapes |

However, due to less economical returns from some major crops (wheat, rice and sugar cane) farmers are now shifting towards growing vegetables and other crops.

Investment in agricultural research – Asia

Investment in agricultural research helps producers through lower production costs, and consumers through reduced prices thereby contributing to growth and poverty reduction. Asia-wide (28 countries) public investment in agricultural research increased by 56 per cent from US\$ 4.8 billion in 1991 to US\$ 7.5 billion in 2000 (Pardey *et al.*, 2005). Of these, two countries alone – China and India – spent 66 per cent of Asia's and the Pacific's total public spending in agriculture research (Table 1). These investments produced high rates of return with a benefit-cost ratio of 2:1 (IFPRI, 2005). Further studies on multiplier effects suggest that an extra dollar in agricultural income typically guarantees an additional US\$ 0.5–1.0 dollar in non-farm income (Delgado *et al.*, 1998)¹.

Some examples of the spectacular impacts of agricultural research in Asia are:

- Cereal production more than doubled exclusively through productivity increases on the same area of cultivated land that was planted in wheat and rice in 1970.
- Food availability increased by 24 per cent despite a 60 per cent increase in Asia's population.
- GDP per capita tripled, driven primarily by growth in urban-industrialization and the rural non-farm sector from 1980 onwards.
- From 1975 the number of poor declined by 28% to 824 million in 1995 (ADB, 2001).

Table 1. Total public agricultural research and development spending by region (1991 & 2000)

Countries	Agricultural R&D spending (M\$)			
	1991	2000	Percentage change	Ratio (2000)
Developing countries (117)	9 459	12 819		
Asia and Pacific (28 countries)	4 847	7 523		
- China	1 733	3 150	82%	21
- India	1 004	1 858	85%	12
- Pakistan	219	152	-31%	01
High-income countries (22 countries)	10 534	10 191		
Total (139 countries)	19 992	23 010		

Source: Pardey *et al.* (2005) based on data from the Agricultural Science & Technology Initiative (ASTI)

¹ Studies on the links between agricultural growth and the rural non-farm economy in Asia have estimated regional income multipliers between 1.5 and 2.0 i.e. for each dollar increase in agriculture value-added, there is an additional \$0.5 to \$1.0 increase in the non-farm sector.

Investment in agricultural research – Pakistan

Agriculture research spending in Pakistan over the past decade reveals a consistently declining trend since the 1990s. A recent study by the Agriculture Science and Technology Initiative (ASTI) of USA (ASTI, 2004) indicated that between 1990 and 2000, agriculture research spending in Pakistan declined by 31 per cent, while it increased by 85 per cent in India and 82 per cent in China. Another study by IFPRI in 2005 indicated that total spending in agricultural research as a percentage of agricultural GDP in Pakistan was 0.31 per cent. This is the lowest spending level in South and East Asia except for Nepal (Table 2). In addition, the research management system is grossly under funded, overly bureaucratized, rigid and inefficient. It was therefore a matter of utmost urgency to restructure the national agricultural research system in Pakistan to address the emerging challenges of improving agricultural productivity, profitability and food security on a sustainable basis. The current Government in Pakistan realized this and a comprehensive restructuring of PARC was approved by the Prime Minister of Pakistan and this restructuring is currently being implemented. Besides providing a massive budget increase for agricultural research, the pay structure of agricultural scientists has also been revised to avoid any further brain drain.

Table 2. Agricultural research expenditure and agricultural percentage of GDP

Country	Expenditure per scientist (\$000)*	% of Agricultural GDP
Pakistan	54	0.31
Nepal	61	0.22
Philippines	66	0.44
Bangladesh	98	0.36
Sri Lanka	101	0.49
Malaysia	345	1.92

*International dollars (PPP basis).

The role of agriculture in poverty reduction

Agriculture plays an important role in the country's development. According to a recent FAO publication some active roles that the agricultural sector performs throughout the development path are: i) agriculture provides food necessary for a growing economy; ii) agricultural exports generate the foreign exchange necessary to import capital goods; iii) this sector is capable of generating savings; and iv) a growing agricultural sector creates a larger local market for non-agricultural sectors.

Unemployment is directly linked with poverty. Like in many other developing countries, the employment situation in Pakistan has also worsened in recent years. The Government realizes that the promotion of the rural economy in a sustainable way has the potential of increasing employment opportunities, reducing regional income disparities, stemming premature rural-urban migration and ultimately reducing poverty. A major example of such sustainable development could be quoted as the promotion of backward industries consisting of a large number of small firms (fertilizer mixing, small-scale transport, agricultural implement manufacturers and repairs workshops) largely labour intensive and vital for rural economies.

Current research priorities for agriculture poverty reduction

Pakistan planners and policymakers recognized the significance of agriculture as far back as the early 1960s. Encouraged by the achievement of food self-sufficiency in wheat and rice through the Green Revolution of the 1960s, the agricultural policymakers in Pakistan implemented a public policy with a dual function: firstly, removing bottlenecks that caused wastage of resources and improving productivity not only per unit of land but also per worker. Secondly, reaching target groups especially in rural Pakistan.

Today the most promising strategy for raising agricultural crop incomes remains in diversification into higher value crops. Pakistan is also well positioned to compete in expanding export markets for citrus, dates and other fruits, particularly to the Middle East. Faster growth in non-traditional agricultural exports (fruits and vegetables, meat, fish) requires improved national capacity to meet sanitary and phytosanitary standards (SPS) imposed in the WTO regime.

The livestock sub-sector (cattle, dairy, sheep, goats and poultry), which is dominated by smallholders, accounts for half of agricultural GDP (11 per cent of total GDP), and is fastest growing component of the agricultural sector. Milk production is expanding but most of the milk continues to be marketed through traditional channels. There is a need to educate farmers to sell the byproducts for increased profits. Significant productivity gains are feasible through use of improved feeds, better veterinary services and more efficient marketing channels to ensure higher prices for farmers. In the susceptible poultry sector, Pakistan needs to be well prepared to contain outbreaks of poultry diseases, such as avian flu, through the timely flow of information regarding such outbreaks.

To conclude this section, PARC has prepared a new strategy to enhance its capabilities to help farmers benefit from agricultural research. This includes:

- diversification into high-value agriculture
- value addition and market connectivity
- application of biotechnology for genetic improvement of crops, livestock and fisheries
- integrated farming systems approach for smallholders
- participatory research, knowledge management and utilization
- linking farmers with markets
- biosafety and biosecurity
- strong agricultural research and extension linkages
- development of resource conservation technologies
- enhanced partnership with national and international stakeholder.

Agricultural credit

Total formal-sector rural credit has expanded rapidly since the Zari Taraqiati Bank Limited (ZBTL) reformed its policies in the late 1990s to simplify lending procedures and make credit more accessible to small landowners. As a result total rural credit grew by an average annual rate of 12 per cent in real terms between 1999-2000 and 2005-2006. Commercial credit more than quadrupled in real terms over the same period, increasing its share of total formal credit from an average of only 23 per cent in 1990s to over half of all credit in 2005-2006. According to data nearly 80 per cent of cultivator households participate in the credit market, with two thirds of total rural credit coming from the informal sector.

Because of uncertainties about land titles in the prevailing land-record system banks are usually reluctant to lend money on the basis of these titles. Thus, improvements in land administration and land titling could improve access to credit, as well as facilitate more efficient use of land, as well as increase security of tenure. Crop insurance measures and a policy to link loans with insurance policies can also generate Commercial Banks' interest in granting loans to farmers.

Alternative secondary crops for increased farmers' income

Due to ever increasing oil prices in the international market (over 80 US\$ per barrel) alternative fuels are getting due priority in Pakistan as well. The Government has established an Alternative Energy Development Board (AEDB) right in the Prime Minister's Secretariat in Islamabad. It has identified the following crops for producing 'biodiesel':

Jatropha (*Jatropha curcas*)

- Suitable for drier land – widely grown in Asia
- Stable and economic price – oil price is stable and low compared to other sources
- Attractive yield time – only 1 to 2 years are needed for the first yield and it lasts 50 years for the harvest, yields 2.5 to 5 mt/ha oil content 25-30%
- Environment friendly, Jatropha BDF is suitable for the Clean Development Mechanism
- Reported area under cultivation 1.5 million ha, projected 10.0 million ha by 2010

Caster bean (*Ricinus communis*)

- Suitable for arid zone climate and rainfed conditions
- Average yield ranges 1.0 to 3.0 mt/ha
- Oil contents range from 40 to 50 per cent depending on the variety
- Suitable for biodiesel production
- Cake used as organic manure
- Pulp used for cardboard and newspaper industry

Salicornia (*Salicornia bigelovii*)

- Leafless annual plant with green, jointed, succulent stems suitable for salt-affected soils
- Grown in the arid, semi-arid sub-tropics (India, Pakistan, Saudi Arabia, UAE, Egypt and Mexico)
- Achieves a biomass of about 15 to 25 tons/ha
- 30 per cent oil content

Sukh Chayn (*Pongamia pinnata*)

- Similar to Jatropha, suitable for drier land – widely grown throughout Asia
- Stable and economical price – oil price is stable and low compared to other sources
- 2–3 years are needed for the first yield and it lasts up to 50 years for the harvest, yields 1.5 to 3 mt/ha; oil content 25 to 30 per cent
- Eco-friendly Sukh Chayn is suitable for the Clean Development Mechanism.

It is significant to point out that the non-edible vegetable oils of jatropha and caster bean have potential for providing commercially viable alternatives to diesel oil. However, more research and economic feasibility studies, as well as support from the Government, is needed to popularize these crops.

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