

Chapter 3

Sustainable Agriculture Ensures Sustainable Rural Development: A Reality or a Myth

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Abstract Agriculture sector is a dominant driving force for the growth and development of the national economy of Pakistan, making the country predominantly an agrarian state. Agriculture is the source of livelihood for 44.7% of the country's total employed labour force. Its present share in GDP is 21.8%, and this contributes to over 79% to the foreign exchange earnings of the country by exporting raw material and semi-processed and processed agricultural products. Pakistan has been ranked the sixth most populous country in the world with the total population of 167 million in 2010. About 67% of the total population resides in the rural areas and directly or indirectly depends on agriculture. Based on these facts and figures, the sector is viewed as the lifeline of country's economy. Nevertheless, poverty in Pakistan is largely a rural phenomenon; therefore, the development of agriculture must be a principal vehicle for alleviating rural poverty. Unfortunately, the country's agriculture is negatively affected by various issues and constraints which have been enlisted in this chapter. These issues, in turn, influence Pakistan's developmental activities, particularly in the rural areas. It is believed that the revitalization of rural development will provide a sound foundation for broad-based accelerated economic growth. In this chapter, an effort is made to demonstrate that sustainable agriculture and holistic approach are imperative to achieve rural development. The analysis leads to the conclusion that sustainable agriculture results in sustainable rural development, and that this is a reality, not a myth.

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1 Introduction

Pakistan is basically an agricultural country, and its agricultural sector has been named the lifeline of the country's economy (Hanif et al. 2005). A major portion (about 67%) of the population lives in the rural areas. Rural people are directly or indirectly dependent on agriculture for their livelihoods (Baig and Khan 2006). Agriculture is a dominant driving force of livelihood for the rural population. In the Economic Survey of Pakistan (2008–2009), it has been noted that although a structural shifts towards industrialization is happening, the agricultural sector continues to be the largest sector of the economy with deep impact on the socio-economic set up. Agriculture is the source of the livelihood of almost 44.7% of the total employed labour force in the country. Also, the World Bank (2007) views agriculture as the largest source of household income for 38 million Pakistanis, including 13 million of the poorest 40% of rural households. With its present contribution to GDP at 21.8%, the agriculture sector is the mainstay of the rural economy (Economic Survey of Pakistan 2008–2009). Further, it was revealed by the Survey that major crops, such as wheat, rice, cotton and sugarcane account for 89.1% of the value added in the major crops.

The value added in major crops accounts for 33.4% of the value added in overall agriculture. Thus, the four major crops (wheat, rice, cotton and sugarcane), on average, contribute 29.8% to the value added in overall agriculture and 6.5% to GDP. The minor crops account for 12.0% of the value added in overall agriculture. Livestock contributes 51.8% to agricultural value added – much more than the combined contribution of major and minor crops (45.4%). Despite all of its positive contributions towards economy, GDP, export earnings, livelihood and labour force engagement, the sector also faces many issues and constraints, and in turn influences the pace of rural development endeavours in rural Pakistan. The country is facing the problems of low and stagnant yields in cereal crops and above all a wide yield gap exists between the potential and the yields realized at the farms (PSPB 2005; Hanif et al. 2005). The agriculture sector and rural development initiatives are constrained by several factors (discussed below). This chapter attempts to identify threats and challenges, and outline remedies to realize sustainable agriculture. However, substantial scope exists for increasing productivity and overall economic efficiency in the sector. It argues that sustainable agriculture has a tremendous potential for sustainable rural development.

2 Overview of Pakistan's Agricultural Sector

Pakistan produces all the major food grain crops, vegetables and fruits due to its various ecological regions, soil types, climatic variations and abundant water supplies. There are two main crop seasons, i.e. Kharif and Rabi. Crops of the Kharif season are sown during April to June, and are harvested during October to

December; whereas Rabi crops are sown during October to December, and are harvested during April to June. The country has the biggest canal system in the world, and due to water availability in all the four seasons, about 25 million tons of cereal crops are produced per annum. Major crops include wheat, rice, cotton, sugarcane, maize, tobacco, barely and rapeseed. Important fruits are mango, citrus, banana, guava, dates, apple, apricot, pear, plum and peach (PSPB 2005). Among these crops, wheat is the most important and major staple food. Rice occupies a very prominent position in the dietary menu of the nation. Export of rice is a decent source of foreign exchange earnings and the country maintains its supremacy and monopoly in long grain, aromatic Basmati rice production on the international market. Cotton is the lifeline of Pakistan's economy. The quantum of cotton production has moved up sizably to over ten million bales (Hanif et al. 2005). The area under cotton cultivation has also increased considerably to about three million hectares. Currently, Pakistan is the third largest cotton producing country in the world. Coarse grains as maize, millets and barley are important crops, especially in harsh areas of arid climate. The country has been blessed with the finest breeds of farm animals (Hanif et al. 2005), and is the fifth largest milk producer in the world (Economic Survey of Pakistan 2005–2006). Based on the roles of the crops and livestock sector in the economy, agriculture remains a priority area for addressing problems of unemployment, poverty alleviation and for fostering economic development. Significantly, the country is focusing primarily on sustainable food security, increasing productivity, commercial agriculture, imports substitution, income diversification and export orientation.

3 Constraints Associated with Pakistan Agriculture

Despite of the very significant role of the agricultural sector in the economy, employment, food self-sufficiency, this sector is constrained by many issues that create unfavourable environments for growth and increased yields. This is due to many factors, including inadequate use of quality seeds particularly hybrids, occurrence of insect pests and diseases, slow down of breeding programs, failures to cope with increasing demands for water for crops, deteriorating soil quality and above all, withdrawal of domestic support policies. In addition, the productivity levels of crops in Pakistan are generally low. Even within Pakistan, there are wide variations in productivity of crops at the farm of progressive growers and the subsistent growers. In wheat, the progressive growers are harvesting yield of 5.5 tons/ha and the national level yield is 2.3 tons/ha (Hanif et al. 2005). However, to improve production levels, the problems of water scarcity, water and wind erosion, salinity and sodicity, water logging, flooding and loss of organic matter from the soil must be addressed. Water is a limiting factor and is used inefficiently as only 30% of the water diverted from the river system actually reaches crops. On the other hand, there are significant natural limitations to increase the quantity of arable land. The continuing demand for more food crops has led to an expansion of dry land farming on fragile marginal lands. Some prime issues have been identified and enlisted in Box 3.1; however, some of the constraints of paramount importance are discussed below:

Box 3.1 Constraints and Threats Associated with the Agricultural Sector and Rural Development in Pakistan

- Stagnant, flat and low yields and big yield gaps;
- Use of old and poor quality seed; and absence of seed technology/testing Labs;
- Under-investment in research and technology development;
- Unreliability of water services; water shortage; low storage capacities of dams; and high conveying losses of irrigation water during delivery;
- Unreliability of water services; water shortage; low storage capacities of dams; and high conveying losses of irrigation water during delivery;
- Small, uneconomic, and fragmented land-holdings;
- Ignorance on scaling up of diversification into new higher value crops and the use of new and more efficient farming technologies;
- Insufficient funds to purchase improved varieties of seeds, fertilizers, pesticides, and machinery etc., to practice modern farming practices and adopt high-tech agriculture;
- Low re-payment capacity and inability to pay back loans;
- Selling of produce at a very low price immediately after the harvest in hurry;
- Weak Extension delivery and lack of extension services;
- Land issues like low fertility status, erosion, water logging and salinity;
- Backward local institutions (Research, Extension, Local bodies, Cooperatives);
- Lack of effective pest management programs and high yield losses due to weeds, pests, and diseases;
- Inadequate credit; poor co-operatives, storage, transport and marketing facilities;
- Lack of knowledge and availability of agricultural machinery etc.;
- Un-expected exposure to natural hazards such as rains, floods, droughts etc.;
- Under performance of rural sector markets;
- Poor communication facilities; undeveloped poor rural infrastructure (lack of roads to markets);
- Low educational levels and literacy rate; and lack of educational facilities;
- Poor and ill health conditions; insufficient basic health and lack of medical facilities;
- Poverty, lack of sanitation, poor health facilities, lower quality of social services and
- Limited employment and income opportunities in agriculture and rural areas.

Modified after IMF (2004); Hanif et al. (2005); Mahmood and Malik (2007).

3.1 Water Shortage

Among all other constraints, water shortage remains the most critical challenge faced by the agriculture sector. The capacity of existing reservoirs is shrinking because of silting. Shortage of water at critical times creates controversies over its sharing and adds to poverty. According to Economic Survey (2005–2006), Pakistan's agriculture has been suffering, off and on, from severe shortage of irrigation water in recent years. The recent drought exposed the vulnerability of the vast Indus Basin irrigation, the need for additional storage to improve and increase supply and to provide greater operating flexibility and insurance. The projected water shortage is estimated to be 23–25 MAF to meet the incremental demand of irrigation for sustained agriculture growth (IMF 2004). On the other hand, precipitations tend to be unevenly distributed throughout the year on much of the rainfed areas. Water is the key engine of agricultural growth and is thought to be the most critical and important input into crop production. Unfortunately, it remains the most limiting factor on both the irrigated and rainfed areas, which are suitable for crop production.

3.2 Smaller Land Holdings and Neglect of Small Farmers

According to PSPB (2005), the country comprises the 48,363 rural localities (villages) where, in addition to crop production, livestock and non-farm activities are also the major sources of employment and income. In the past, agricultural policy was biased in favour of medium-to large-scale farmers. In recent years, however, the Government has come to realize the comparative advantage of smallholder agriculture, and is now reorienting its policies in support of smallholders (IFAD 2007). Because of the law of inheritance, holdings are subdivided and continue to become smaller up to a level that frequently becomes uneconomic under the present conditions, and owners of small farms do frequently not have enough resources to invest into improved production methods. As depicted in Table 3.1, about 75% of

Table 3.1 Numbers of private farms in Pakistan

Size of farm in hectare	Percent of the total number of farms	Percent of the total farm area	Percent of farm area cultivated
<2	47.5	11.2	92
2–<5	33.4	27.5	91
Sub-total	80.9	38.7	–
5–<10	12.2	21.5	80
10–<10	4.7	15.8	79
20–<60	1.8	13.9	70
> 60	0.3	10.1	54
Sub-total	6.8	39.8	–
Total	100	100	–

Source: PSPB 2005

farms have less than 5 ha of land, which, however, covers only 35% of the total area. Similarly, only 9% of farms, with an area of 10 ha and above, expand over 40% of the cultivated area (PSPB 2005).

While citing the Agriculture Census of 1990, Hanif et al. (2005) reported that there are 5.07 million farms in the country, and 81% of them are small farms that account for 39% of total cultivated area. Middle size farms (5–10 ha) are 12% and account for 22% of cultivated area. Large farms (10 ha and above) are 7% of total farms, but account for 40% of total cultivated area. The average size of small, medium and large farms is 1.8, 6.6 and 21.6 ha respectively (Hanif et al. 2005). Great inequality and land concentration exist between small and big farmers. The agriculture sector is characterized by strong inequality in the distribution of assets, particularly land and water. About 2% of farm households control more than 45% of the land area. Also, large farmers have captured the subsidies in water and agriculture, as well as the benefits of agricultural growth (World Bank 2007).

3.3 Gaps in Productivity

Productivity levels of crops in Pakistan are generally low. Even within Pakistan there are wide variations in productivity of crops at the farm of progressive growers and the subsistent growers. In wheat, progressive growers are harvesting yield of 5.5 tons/ha and the national level yield is 2.3 tons/ha. In cotton, the yield of progressive growers is 3.5 tons/ha and the national average yield is almost half of that as shown in Table 3.2. Similar findings have been reported by the (PSPB 2005; Hanif et al. 2005).

3.4 Women Farmers Working in Agriculture and Their Status

In Pakistan, the women farmers are viewed generally as unproductive and deprived in many ways, due to early marriages, lack of schooling and employment, menial tasks and social isolations (Mahmood and Malik 2007). Women in poor families and in rural areas who account for 70% of the female population are forced to live inferior lives due to the double discrimination of poverty and discrimination against women (Maria 2001). Women constitute one of Pakistan's most disadvantaged

Table 3.2 Potential yield and yield gaps of various crops (tons/ha)

Crops	Potential yield	National average	Yield gaps
Wheat	6.4	2.2	4.2
Rice	9.5	2.0	7.5
Maize	6.9	1.5	5.4
Sugarcane	160.0	46.0	114.0

Source: PSPB 2005

groups. Almost all of the women in rural areas engage in agriculture as unpaid family workers, and their participation rate in wage work is extremely limited. Many women seasonal workers are engaged in cotton agriculture in the Southern region. Often, men are obliged to migrate to the Northern region looking for employment opportunities in the non-agricultural sectors for the reason that cotton production alone is not sufficient to earn a living. Because of this, women workers' responsibilities in agriculture have increased as a result. Since migration work in the Gulf countries has increased lately, the labour force participation rate of women in the agricultural sector has further increased. Furthermore, the delay in the modernization of farm work is also one of the reasons for needing women in the labour force (JICA 1999).

4 Pakistani Rural Development

Recently, the subject of “rural development in Pakistan” has received great attention and considerable importance. Since independence, Pakistan has tried many programs for Agriculture and rural development (GoP 2008). The first formal attempt to reconstruct and improve the rural areas was made in 1953, when the Village Agricultural and Industrial Development Programme (or V-Aid programme) was introduced with American assistance (Ahmed 2005). As reported by Malik (2003b) and Ahmed (2005), many programs and initiatives were undertaken in the country, the important of them include: Village Aid Programme (1952–1961); Integrated Rural Development Programme (1952–1961); Basic Democracies (1959–1970); Integrated Rural Development Programme-IRDP (1972–80); People's Works Programme (1972–1977); Local Government. and Rural Development Programme (1979–1985); Prime Minister's Five Point Programme (1985–1988); People's Programme (1989–1990 and 1994–1997); Tameer-e-Watan Programme (1991–1993 and 1996–1998); Social Action Programme SAP-I (1993–1996); Social Action Programme SAPP-II (1997–2002); Khushhal Pakistan Programme (1999–2000); Tameer-e-Pakistan Programme (1991–1993 and 1998–2000); and Khushal Pakistan Programme (KPP)-II (2003–2007).

All these programs could not contribute substantially to the development of the rural areas on a long term; rather they remained confined only to the visible physical structures (roads and buildings for schools and hospitals, etc.). Several approaches designed primarily to improve the living standard of rural people, through increased agricultural production and improved farm income, have been tried, however, it remained un-successful. In rural areas, socioeconomic development is low, with high levels of poverty and low levels of literacy, especially among women (Baig et al. 2009; WHO 2010). Some development indicators and their implications for rural development in Pakistan are presented in Table 3.3. Prime threats and challenges have been identified and discussed in the preceding paragraphs. Because women play a very productive role in the agriculture sector and rural development as well, their role deserves further discussion.

Table 3.3 Summary implications for rural development in Pakistan**Shortage of:**

- | | |
|--------------------------|--|
| • Educational facilities | • Living space |
| • Health services | • Arable land |
| • Housing units | • Clean water |
| • Food | • Sanitation/waste water disposal facilities |

Increase in:

- | | |
|---------------------------------------|--------------------------------|
| • Unemployment | • Over crowding |
| • Land fragmentation | • Katchi abadies ^a |
| • Import of food and edible oil, etc. | • Poverty |
| • Environmental problems | • Unrest and unsafe conditions |
| • Congestion in households | • Crime rate |

Source: Modified after NIPS 2005

^aResidential areas developed by the poor segment of society where houses are built by the mud and sand. Usually these people encroach the state land occupy it illegally

4.1 Women and Their Role in Rural Development

In rural families, women's role is significant even economically as they help their men in farm activities. Women constitute a little less than half of the total population of Pakistan. They offer great help in the fields, in cottage and in business. On the other hand, Mahmood and Malik (2007) note that Pakistani women are generally viewed as unproductive and deprived in many ways, due to early marriages, lack of schooling and employment, unskilled tasks and social isolations. Maria (2001) notes that opportunities for women and girls in rural Pakistan are limited by strict observance of the customs and traditions practiced in different regions. Since empowerment is a necessary condition for women to improve their lives, establishment of small women groups can improve their lives. Innovative approaches to increasing women's economic opportunities, developing skills, literacy programmes, organization and mobilization within socially and culturally acceptable norms, have been and continue to be initiated in the country.

4.2 Poor Infrastructure and Lower Quality of Social Services

It is not possible to achieve any improvement endeavour without developing a good infrastructure. The country does not have the strong infrastructure and enough social services are not available to its rural poor. For example, over one third of adult females are literate, compared to nearly two thirds of adult men due to lack of proper educational set up and facilities. In 2004/2005, some 66% people had access to a tap or hand water pump, and 54% had access to a flush toilet. An overview of the services available to rural localities has been presented in Table 3.4.

Table 3.4 An overview of infrastructure and services available to rural society

Total estimated population of Pakistan in millions (2010) ⁶	167
Annual population growth rate ⁶	1.87
Percent population in rural areas (2009) ¹	65
Percent contribution of agriculture to GDP	21
Percent workforce employed in agriculture	44
Percent over all adult literacy rate in 2004–2005 (age 15 and above) ²	50
Percent male adult literacy rate in the country (age 15 and above) ²	63
Percent female adult literacy rate in the country (age 15 and above) ²	36
Percent rural male adult literacy rate (age 15 and above) ²	56
Percent rural female adult literacy rate (age 15 and above) ²	24
Percent GDP spent on health ²	0.6
Government expenditure on health as % of total government expenditure ²	6.4
Percent population with sustainable access to an improved water source ²	90
Percent rural localities where drinking water is either brackish or it is not available at all ²	21
Percent population with improved access to sanitation ⁷	62
Percent rural localities not having toilets and any sanitation system ³	46
Percent of rural localities not having pacca (metal led) streets and cemented drains ⁵	56
Percent localities with partial network of pacca (cemented/metalled) streets and drains ⁵	26
Only a few rural communities have wastewater treatment plants. Percent of the rural communities having water treatment facilities, but the current flows exceeded the designed capacity ³	70
Percent rural communities have partial availability of electricity ⁵	25
Percent population not having the electricity at all ⁵	25
Per capita real income in USD (2009) ⁶	1,046
Rural population density – persons per square kilometer (2001) ⁷	438
Percent rural population living below national poverty line (2004) ⁴	32.6

Sources: (1) United Nations Population Division; (2) Pakistan Social and Living Standard Measurement Survey (PSLM), 2004/2005; (3) World Health Report, 2006; (4) Human Development Report 2005; (5) World Development Indicators, 2005 (World Bank); (6) Economic Survey of Pakistan 2009; (7) CIRDAP 2005

5 Suggested Strategies to Achieve Sustainable Agriculture and Rural Development

The World Bank (2008) presumes that agriculture will continue to be a fundamental instrument for sustainable development and poverty reduction. Without developing agriculture and making sustained progress in these areas, rapid overall economic growth and poverty reduction targets are impossible to achieve (World Bank 2007). Many workers believe that Good Agricultural Practices (GAP) enhance crop yields, bring prosperity, elevate living standards and enhance livelihood of rural people. Hanif and his co-workers believe that the use of quality inputs in appropriate

proportion and quantity has a great bearing on productivity of crops. Important inputs include quality seeds, fertilizers and pesticides and an easy and timely access to agricultural credit facilitates are required to expand the capacity of the farmers to purchase these inputs. Whereas many workers (Memon 1993; Gill et al. 1999; Malik 2003a; Baig and Khan 2006; Mahmood and Malik 2007) maintain that sustainable agriculture is pre-requisite to make development initiatives in rural areas. Without addressing the issues associated with the agricultural sector of the country, it likely would be impossible to realize both the sustainable agriculture and resultant rural development.

In the scenario, to realize both the sustainable agriculture and rural development, a two-step strategy is proposed. As a first step, the most important task must be to make dedicated efforts to address the issues and constraints associated with the agricultural sector. The second part of the strategy should be to improve agriculture through the combination of modern scientific technologies and indigenous knowledge. Diversification within agriculture will enhance agriculture role in the economy and society and it will ultimately result in sustainable rural development. An improved and sound infrastructure with the suitable facilities can further strengthen the rural sector. In addition, a small and medium enterprises (SMEs) sector may have a great potential for generating employment, especially for the low-income groups. Additionally, creating a business environment that is supportive of SMEs is also an important strand of the poverty reduction strategy. For example, the development of an agro-processing sector consisting primarily of fruits, vegetables, dairy and livestock is proving quite promising (PRSP 2004), and can help improving rural economies and livelihoods. There was neglect of the rural non-farm sector, which is of particular importance in the livelihood of small farmers and the landless; this had led to unemployment and migration. It may not have happened if different rural development policy could have been in place and implemented.

It seems imperative to devise an integrated approach and a comprehensive strategy (by incorporating the above-mentioned points) that could cater the needs of rural people, and address the threats and challenges faced by the rural development institutions, involving all the stake-holders: including academia, researchers, rural communities, members of the civil societies, NGOs, donors, planners, policy makers and local institutions. All the key players and stakeholders involved in both the development of agriculture and rural development sectors must play their roles in order to realize sustainable development. Aga Khan Rural Support Program (AKRSP 2005) can be presented as a unique example. It was launched in various parts of Pakistan and proved very successful in bringing development and enhanced income levels and livelihood, as its practitioners enjoyed the sense of ownership. The model was replicated in many parts of the world and proved successful in each and every place it was implemented. Based on its successful working, many prestigious organizations (like United Nations and World Bank) appreciated it, presented it as a role model and endorsed it to realize rural development (AKRSP 2005).

6 Conclusions and Recommendations

Agriculture is the prime sector of the national economy of Pakistan. Two-thirds of the country's population and 80% of the poor live in rural areas, and a significant segment is involved in farming. Agriculture is an effective engine for growth, and an important basis for prosperous livelihood for most agriculture-based countries. The constraints in the rural areas include: unequal distribution of land and access to water, water shortage and big conveyance losses, poor quality seed, soil problems (like the declining of soil fertility and land degradation), low productivity of crop agriculture, inadequate infrastructure, ineffective public-service delivery and insufficient participation by rural people in most public-sector development programs. Moving ahead towards sustainable development will remain impossible without addressing these issues through sustainable farming practices. Dedicated efforts are needed to strengthen the agriculture sector and achieve higher growth. Potentially efficient and equitable solutions for increased agricultural growth and poverty reduction includes increasing current yields as well as promoting diversification to high value-added crops (including mushrooms, flowers, medicinal plants and spices) and activities, especially by the small-farm sector. In addition, non-farm income sources (like cottage industries) deserve due attention. Small and medium enterprises (SME) have great potential to elevate rural economies. To realize sustainable growth and development, it is also imperative that all key actors are allowed to play their productive and constructive roles. All the stake-holders (including youth and women, academia, researchers, rural communities, planners, policy makers and local institutions) should join hands towards a sustainable future. Among all the contributing factors, sustainable agriculture has the greater share in the development initiatives. It clearly indicates that sustainable agriculture means sustainable rural communities. It is a reality – not a myth.

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