

The State of Food Security in Pakistan: Future Challenges and Coping Strategies

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1. Introduction

Pakistan is a low income developing country. Agriculture is its most important sector due to its primary commitment of providing healthy food to her fast growing population. Although the rate of population increase has considerably slowed down from over 3% in 1980s to 2.09% in 2009-10, it is still considered high¹. With the current rate of population growth, the population is expected to get doubled by 2050—making Pakistan 4th largest nation by 2050 from current status of 6th most populous state of the world (Government of Pakistan, 2010).

As regards the land resources in Pakistan, the total cultivated area has increased by just 40% during past 60 years, while there was more than 4 times increase in population with urban expansion of over seven-fold—resulting into mega-cities² as well as rising population pressure on cultivated land. Despite that wheat production—a major food crop, has increased by five-fold—the country is still marginal importer of wheat. Tremendous efforts are needed to narrow the gap between population growth and domestic food production.

Reducing poverty, hunger and food insecurity are essential part of Millennium Development Goals³ and are prerequisites for economic development. Food security and economic growth mutually interact and reinforce each other during the development process (Timmer, 2004). A country which cannot produce the needed food quantity and has no resources or afford to buy food from the international market to meeting its needs is not food sovereign state (Pinstrup-Andersen, 2009). Food security, thus, becomes a fundamental component of national security that which is generally ignored (Fullbrook, 2010). The extra-ordinary rise in food prices in later part of the first decade of 21st century raised an alarm bell about food security, particularly for the developing countries of the world—where majority of globe's population dwells. Pakistan is no exception. In order to achieve food-secure and pro-poor agricultural growth, Pakistan needs to adopt a comprehensive approach towards increasing productivity of all food crops and livestock sector rather than merely concentrating upon achieving just wheat-based food security. In order to benefit from adoption of new agricultural technologies, the farm households should be able to finance expensive inputs and diversify their livelihoods through optimum mix of farm and non-farm sectors' employment.

¹ At the time of independence, Pakistan's population was only 32.5 million. It is around 170 million presently. Pakistan is still counted among the high fertility countries having a large proportion of young adults and children. The median age of population has increased from about 18 years in 1998 to 22 years in 2008.

² Currently, Pakistan is most urbanized nation in South Asia where 36% of country population is living in cities. The rate of urbanization in Pakistan during 2005-2010 was 3% per annum. In 2005, more than half of the total urban population was living in urban areas of 8 big cities, i.e. Karachi, Lahore, Faisalabad, Rawalpindi, Multan, Hyderabad, Gujranwala and Peshawar. It is expected that by 2030, the rural-urban population ratio shall be 50:50 (Government of Pakistan, 2010).

³ MDG-1 calls for halving hunger and poverty by 2015 in relation to 1990.

Managing food security in Pakistan requires an understanding about the dimensions of food insecurity, what are the future challenges, and how agricultural policies affect food supply and incomes, the poor vulnerable in rural and urban areas, and what is required to be done. The main focus of this paper is to trace the pathways to achieve food and nutritional security for a growing population in Pakistan.

This paper is organized into seven sections. Section 2 discusses the concept of food security. Section 3 analyzes food security situation in Pakistan in terms of food availability trends, its factors and nature of food security in the future. Section 4 critically evaluates Pakistan's food policy. Future challenges are discussed in Section 5. The ways forward are described in Section 6. Section 7 concludes the paper.

2. What is Food Security?

*Food security is the peoples right to define their own policies and strategies for the sustainable production, distribution and consumption of food that guarantees the right to food for the entire population, on the basis of small and medium-sized production, respecting their own cultures and the diversity of peasant, fishing and indigenous forms of agricultural production, marketing and management of rural areas, in which women play a fundamental role.*⁴

The history of food security dates back to the Universal Declaration of Human Rights in 1948 in which the right to food was recognized as a core element of standard of living and also to the world food crisis of 1972-1974. The food security concept continued to develop overtime and approximately 200 definitions and 450 food security indicators are now available in the literature⁵.

The term “food security” used to refer the access to adequate amount of food for meeting dietary energy needs that implied for many as self-sufficiency at the national level—producing required food domestically (Pinstrup-Andersen, 2009). A country is self-sufficient in food when it is able to manage supply and demand balance by producing domestically—irrespective of what the equilibrium price would be which may not be affordable to majority of the population in a developing economy.

The focus of national and global food security is generally on the supply side of the food equation—whether sufficient food is available (Pinstrup-Andersen, 2009)⁶. The availability of food however cannot assure the access of the people to food. To ensure food security at the household or individual level, the access part needs to be addressed. This led the World Food Summit in 1996 to redefine the term as ‘*food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life*’. This definition encompasses five fundamental aspects: availability, access, stability, nutritional status and preferences of food. All of these components are influenced by

⁴ Final Declaration of World Forum on Food Sovereignty, 2001

⁵ Maxwell and Frankenberger (1992) listed 25 broadly defined indicators. Riely and Mook (1995) listed 73 indicators, somewhat more disaggregated than those mentioned in Maxwell and Frankenberger (1992). Chung et al. (1997) note that even a simple indicator such as a dependency ratio can be used with many different permutations. They list some 450 indicators (Hoddinott, 1999).

⁶The term food is meant as dietary energy.

physical, economic, political and other conditions within communities and even within households, and are often destabilized by shocks such as natural disasters and conflicts (UK Parliament, 2006).

The *availability and access* are two important dimensions of food security. The *availability* refers to sufficient quantities of quality/nutritious food available to all individuals within a country—through domestic production or imports, or donors. However, even with sufficient availability of food at the country level, food availability is a serious concern in areas having armed conflicts, non-availability of arable lands, and existence of prolonged droughts—this is true for many areas in Pakistan. The distribution of food stuff in these areas is also faulty.

The *access* refers to the capacity to produce, buy and/or acquire appropriate nutritious food by the households and the individuals (Timmer, 2000). Having access requires that sufficient food is consistently available in the market. But, the availability of sufficient food at the country or local level does not guarantee that all people are food secure, since low incomes, lack of roads and infrastructure could deny access to desired quantities of quality food (UK Parliament, 2006). The primary cause however is poverty that people lack sufficient purchasing power to acquire necessary quantities of quality food. Therefore, both availability and access parts of food security are inseparably linked to each other (Pinstrup-Andersen, 2009).

The access entails both physical access and economic access—the former refers to a place where food is available and the latter denotes ‘entitlement’ to food (Sen, 1982). The former requires efficient market infrastructure to have access of people at low cost. The *entitlement* can ensue through own production or having food buying capacity from the market or having access/right to other sources of getting desired food (Staa *et al.*, 2009). Therefore, there is a direct relationship between poverty and food insecurity since the very poor cannot take precautionary measures against food insecurity and thus they are the first to be vulnerable to it (Cullet, 2003; Herrmann, 2006).

Stability refers to consistent supply of nutritious food at the national level as well as stability in access to food at the household and individuals levels. It is therefore directly affected by the performance of the agriculture sector. Only a small proportion of consumers in developing countries can afford to store food for the whole year. Therefore, besides production, stability requires better management of domestic production, food markets integration, and rational and effective use of buffer stocks and trade (FAO, 2002).

Pakistan has faced severe floods during 1973, 1992 and 2010 and droughts in 1998, 2000, and 2001. Fluctuations/shortages in food grains production have therefore been very common in Pakistan. At times, the government has had to import significant quantities of food items to meet the shortages. In order to meet the shortages in deficit/urban areas and save consumers from high food prices, the government has been actively pursuing the policies of support/procurement prices, storage and distribution though at a very high cost. Therefore, market infrastructure has a much more role to play.

The definition of food security also alludes to ‘*safe and nutritious food*’ that is required for an active and healthy life. For an active and healthy life, the human body has to effectively utilize the available nutrients in the food consumed (Staa *et al.*, 2009).

Therefore, effective biological absorption of food in the body is as important for food security as the availability, accessibility and stability. Biological food absorption is affected by food preparation and health condition of an individual—influenced by sanitation, clean drinking water, and knowledge of the households regarding proper food storage, processing and basic nutrition⁷. Furthermore, the *preferences for food* add another dimension to food security that relate to the social and religious norms. People with equal access to food but having different food preferences based on religion, society norms, taste *etc* could show entirely different levels of food security. The foods are to be socially and culturally acceptable and consistent with religious and ethical values (Pinstrup-Andersen, 2009).

The above discussion wrapped around various dimensions of food security—availability, accessibility, stability, nutritional status and preferences, in general and in Pakistan in particular, highlights the fact that achieving food security is difficult, complex and challenging phenomenon. In view of the recent surges in food prices and policy shifts in response by various countries in panic further sparked off uncertainty that even led to the developed nations to think of “whether their own food security is in peril” (Fullbrook, 2010; P.5). Moreover, the countries who lack the food production potential and however afford to import their food needs started looking for chunk of agricultural lands across the borders to ensure uninterrupted food supply—overlooking a fundamental reality that when the locals of the host country are short of food who would guard the supply off to them. The considerations of the world are mainly confined to assuring steady supply of affordable nutritious food, but are missing the fundamental issue of ‘security’—food is basically energy for humans without which “we are all dead” and thus should be viewed as a “security good” (Fullbrook, 2010; P.6).

3. Food Security Situation in Pakistan

3.1 Trends in Food Production, Availability and Food Security

Agricultural production is the foundation of food availability, especially for calories and proteins. Adequate food supply at affordable prices is the cornerstone of food security policy of all nations of the world including Pakistan. Pakistan has made significant progress in terms of increasing supply of food items. Per capita availability of cereals increased from 120 kilograms in 1961 to 137 kilograms 1990-91 and further increased to 154 kilograms in 2008-9 (Ahmad *et al.* 2010, and Table 1), more than 80% of which is accounted for by wheat alone. The government of Pakistan has tried to maintain the availability at the level of 2400 calories per person per day availability since early 1990s—increased from a level of 1754 calories per person per day in 1961 (Table 2). However, daily average availability of calories per person in the country is substantially lower than the average of other developing and developed countries, by 10% and 26%, respectively. The changes overtime in the composition of food intake show a shrinking share of wheat in total calories available and a rising share from animals and other sources (Table 2): the share of wheat declined from 48% in 1990 to 38% in 2006, while the share of other cereals declined more prominently, from 20% in

⁷ For example, in Hyderabad, contaminated water took 10 lives and 1000 people were hospitalized over the course of two months in 2004. Khan *et al.* (2002) reported that 51% of the vegetable produce was unsuitable for human consumption due to excess chemical residues.

1970 to 6% in 2006. The share of livestock products in calorie intake increased from 12% in 1970 to 18% in 2002, which marginally declined to 15% in 2006. The share of other items (vegetable oils, vegetables, fruits and sweeteners) has substantially increased from 20% in 1970 to 37% in 2006.

Table 1. Per Capita Availability of Food in Pakistan

Years	Per capita annual availability (kg/person/annum)							Per capita daily avail.(kg)
	Food grains	Edible Oil /Veg.Ghee	Meat	Milk	Fruits	Vegetable	Total	
1990-91	137.44	9.99	13.90	60.93	47.73	23.49	293.48	804.06
1991-92	144.18	13.07	14.38	62.26	48.30	27.70	309.90	849.03
1992-93	149.93	12.50	15.48	63.09	49.06	24.45	314.51	861.68
1993-94	158.80	10.50	16.07	64.60	53.65	27.20	330.82	906.35
1994-95	138.20	12.19	16.51	66.07	55.63	28.84	317.45	869.72
1995-96	148.55	11.42	17.25	67.16	56.23	27.03	327.64	897.64
1996-97	153.95	10.46	17.87	68.58	55.34	29.98	336.19	921.06
1997-98	161.07	11.59	14.00	81.45	56.48	31.11	355.70	974.53
1998-99	167.25	12.38	14.13	81.72	56.07	29.04	360.59	987.93
1999-00	158.83	11.08	14.19	82.15	52.23	24.55	343.03	939.80
2000-01	136.51	11.48	14.42	82.92	51.31	28.65	325.29	891.20
2001-02	135.53	10.67	14.50	83.45	51.29	25.35	320.78	878.85
2002-03	142.38	10.77	14.65	84.28	50.36	26.65	329.09	901.61
2003-04	143.83	11.16	14.74	84.42	47.82	28.23	330.20	904.66
2004-05	142.58	12.35	15.19	85.50	52.64	26.17	334.42	916.23
2005-06	140.98	12.75	16.33	90.30	51.25	31.18	342.79	939.14
2006-07	144.79	12.81	16.70	94.54	50.04	29.79	348.67	955.26
2007-08	155.04	13.29	17.00	93.93	53.71	31.23	364.20	997.79
2008-09	153.99	13.45	17.50	94.81	52.88	24.06	356.69	977.22

Source: Farooq *et al.* (2009)

Domestic production, commercial imports, and food aid are the main constituents of food availability at the national level. The production of cereals and pulses increased more than 3.5-fold since the early 1960s. Nonetheless, Pakistan has been importing significant quantities of wheat, pulses and edible oil to meet the needs of its fast growing population. The share of imports in wheat consumption during the interval 1961-2006 has varied from 26% in 1961 to less than 1% in 2004 (Table 3). The huge deficit during the early 1960s was largely reduced during the 1970s as a result of the green revolution. The dependence on wheat imports, however, re-emerged later because of stagnation in wheat productivity. In contrast, Pakistan has been very successful in producing enough rice for domestic consumption and even generating a significant amount of exportable surplus (Ahmad, *et al.*, 2010).

One of the important indicators of economic access to food is the proportion of people below the poverty line (FAO, 1998). The historical evidences show that poverty increased during the 1960s despite rapid economic growth, it declined during 1970 through 1987-88 in spite of the growth being relatively slower, the declining poverty trends got reversed in 1990s albeit with reasonable rate of economic growth, and during 2000s poverty continued to rise in the face of uncertain economic growth. Nevertheless, the daily average availability of calories per person progressively increased over the last five decade—even though this availability has not been consistently reflected in declining poverty.

Table 2. Per Capita Availability of Calories and Shares of Various Sources

Year	Total		Wheat		Other Grains		Pulses		Animal		Others	
	Calories	%	Calories	%	Calories	%	Calories	%	Calories	%	Calories	%
1961	1754	100	742	42	342	19	114	6	260	15	296	17
1970	2203	100	984	45	438	20	77	3	257	12	447	20
1980	2124	100	967	46	304	14	49	2	261	12	543	26
1990	2410	100	1153	48	274	11	58	2	309	13	616	26
1995	2345	100	1048	45	212	9	59	3	353	15	673	29
2000	2447	100	1000	41	244	10	68	3	436	18	699	29
2001	2426	100	1000	41	256	11	58	2	436	18	676	28
2002	2419	100	999	41	275	11	59	2	437	18	649	27
2003	2320	100	945	41	108	5	61	3	322	14	886	37
2004	2231	100	897	40	107	5	62	3	321	14	844	38
2005	2271	100	914	40	108	5	63	3	325	14	861	38
2006	2423	100	930	38	110	6	65	3	330	15	888	37

Source: Ahmad *et al.* (2010) (Table 5.7 updated)

Despite significant improvement in food supply in the aggregate, malnutrition is a widespread phenomenon in Pakistan (Ahmad *et al.*, 2010). Rather, it has been argued that per capita food intake in the country has been higher than the recommended average at the national level (Khan, 2003). Nevertheless, one third of all pregnant women were malnourished and over 25% babies had low birth weight in 2001-2. Malnutrition was a major problem, responsible for more than 30% of all infant and child deaths in the country in 2001-02. The incidence of moderate to severe underweight, stunting, and wasting among children of less than 5 years of age was about 38%, 37% and 13% respectively in 2001-02 (Planning Commission and UNICEF, 2004). Malnourishment among mothers (as reflected in body mass index) was 21% in 2001-02 (Khan, 2003), while overall undernourishment was about 24% in 2004—which is not only worst in South Asia after Bangladesh, but this has been increasing over time (FAO, 2008). Micronutrient deficiency in Pakistan is pervasive in the country, which is regarded as ‘*hidden hunger*’ reflecting a combination of dietary deficiency, poor maternal health and nutrition, high burden of morbidity and low micronutrient content of the soil especially for iodine and zinc (Government of Pakistan, 2010). The deficiency in most of these micronutrients affects the immunity, growth and mental development and may underlie the high burden of morbidity and mortality among women and children in Pakistan. This indicates that despite having sufficient food available at the national level, a large chunk of our population mostly the children and the women lack access to nutritiously balanced food.

The foregoing discussion highlights the fact that enhanced food security on its own cannot guarantee good nutrition status at the household level (Fullbrokk, 2010). Thus, greater food availability in Pakistan at the national level has not translated into actual increased consumption of calorie-rich food at the regional or household level reflecting reduced access to nutritious food—this could be due to worsening income and landholdings inequality in the country. A rising calorie-based poverty implies that most people had declining access to nutritious food. In addition, disparities in access to

education and health may also be crucial. Therefore, simply emphasizing on increasing food supply cannot assure food security. In such circumstances the stable nutritious food supply and its distribution is considered to be crucial issue (Pinstrup-Andersen, 2009).

Table 3. Food Balance-Sheet for Wheat (Quantity in '000' Tonnes)

Year	Production	Imports	Stock change	Exports	Total	Feed, seed and others @ 10% of production	Availability	Import share
1961	3814	1080	-308	0	4586	385	4205	25.69
1970	7294	229	336	108	7751	729	7022	3.26
1980	10856	604	-1217	3	10240	1086	9154	6.60
1990	14316	2047	-691	2	15670	1432	14238	14.38
1995	17002	2500	-1399	0	18103	1700	16403	15.24
1996	16907	2500	-2539	0	16868	1691	15177	16.47
1997	16650	4088	-3487	0	17251	1665	15586	26.23
1998	18694	2023	-2181	0	18536	1869	16667	12.14
1999	17856	2006	-2061	0	17801	1786	16015	12.53
2000	21079	80	3045	80	24124	2108	22016	0.36
2001	19024	267	705	643	19353	1902	17451	1.53
2002	18227	148	-1093	1338	15944	1823	14121	1.05
2003	19183	94	-590	43	18644	1918	16726	0.56
2004	19500	374	-1050	20	18804	1950	16854	2.22
2005	21612	535	851	471	22527	2161	20366	2.63
2006	21277	133	-1411	976	19023	2128	16895	0.79
2007	23295	1820	-936	530	23649	2330	21320	8.54
2008	20959	3188	-1867	142	22138	2096	20042	15.91
2009	24033	0	5000	0	29033	2403	26630	0.00

Source: Ahmad *et al.* (2010) (Table 5.8 updated)

3.2. Nature of Future Food Insecurity

In view of continuously rising population of Pakistan, the food demands of the country shall naturally increase. However, it is worth mentioning that future food demands would be different from today because of the factors like: a) increased proportion of older people due to age longevity; b) greater urbanization and emergence of big cities; c) changes in family composition and structure; d) changes in food consumption patterns and habits; e) prevalence of serious diseases like Cardiac, Diabetic and Hepatitis etc. and their special foods requirements; and f) rapid penetration of Super Markets and international Food Chains in developing countries. To target such future diversions in food requirements, the major focus of the planners is to incentivize the agricultural production to future needs. Thus, production system needs to be channelized towards higher production of fruits, vegetables and other high value agricultural commodities.

In Pakistan, 68% of the population earns their livelihood from agriculture sector. Livestock and crops sub-sectors contribute up to 28% and 24% towards rural households overall income, respectively. The non-farm enterprises, wages and services, remittances and other sources contribute 20%, 18%, 7%, and 3%, respectively. In rural Pakistan the

economic access to food is mainly influenced by household level differences in land holding, education and employments. Decreasing size of land holdings (32% less than 1 ha and 24% less than 2 ha) besides inability of the economy to generate new employment and reduced additional employment capacity in the agriculture sector is not permitting to enhance productivity or incomes beyond a certain limits in future.

Even though food in Pakistan is predominantly produced in rural areas like other most of the developing countries, a majority of poor who are food insecure as well live in these areas—having lower economic access to food as compared to urban areas (World Bank, 2008; Staatz *et al.*, 2009). Reliance on markets to obtain food for most of the food insecure people both in urban and rural areas is a common feature. The dependence of the urban poor on food markets is very well-known and documented, while reliance of the most of the rural food insecure has rarely been acknowledge—including landless, marginal farmers and majority of small farmers (Staatz *et al.*, 2009). In addition to landless rural inhabitant (i.e. 45%), more than 30% of the cultivators are net buyers of food staples—accounting 62% of the overall rural population; who are partially or totally dependent on market for food needs (Ahmad, 2010).

Unfortunately, the government efforts in providing relief to consumers and the subsidy involved in food staples are rarely meant for these rural households. Furthermore, the access to the factors affecting the biological food absorption including sanitation, clean drinking water, and knowledge of the households regarding proper food storage, processing and basic nutrition, and health facilities, infrastructure etc. is very poor in rural areas. Particularly, the access to these indicators in food insecure rural areas is overwhelming shocking. Therefore, improving market infrastructure, arranging safety net programs, provision of better education and health facilities could be the central elements of any strategy to reduce chronic food insecurity in both the rural and urban areas in future.

3.3 Recent Nationwide Crop Damages by Floods and Food Security Issues

Pakistan has suffered from unprecedented nationwide floods—flash, riverine and riverine delta type floods⁸, spread over 160 thousand Km² directly affecting more than 20 million people (UN-OCHA Satellite pictures, 2010⁹); of which, 80% were directly dependent on agriculture. More than one million houses have been destroyed—about half of them are not even livable. More than 2 million ha of standing crops are affected to a varying degrees worth Rs.250 billion cash crops¹⁰ (Tables 4). More than 1.2 million livestock and 6 million poultry heads worth billions of rupees have also been lost (MinLDD, 2010). About 0.5 million tons of wheat seed for coming *rabi* season stored at the farm households' level has been completely destroyed. The loss of cash crops, particularly cotton, will severely affect the textile/agro-based industry and the employment and export.

⁸ Flash floods had rapid onset and were highly destructive; riverine floods were slow in their onset but more people affected and it prolonged in time; the riverine delta floods are still persistence and water may stay there for months.

⁹ UN-OCHA --- United Nation's Office for the Coordination of Humanitarian Affairs.

¹⁰ In monetary terms, the largest loss took place to cotton crop followed by paddy and sugarcane. It is worth mentioning here that this damage of cash crops shall directly affect financing land preparation and other purchased inputs costs.

Table 4. Preliminary Estimates o Crops Damages by Floods Across Provinces (Mln Rs)

Crops	Punjab	Sindh	KPK	Balochistan	All Pakistan
Sugarcane	12.515	7.786	2.899	-	23.200
Paddy	3.695	31.253	1.364	15.070	51.383
Cotton	50.000	25.000	-	1.921	76.921
Other crops	37.475	15.587	21.059	24.376	98.497
Total	103.685	79.626	25.322	41.367	250.001

Source: Presentation by FAO Representative at Pakistan, dated 8th September 2010

The majority of the districts affected by the floods were already food insecure, and underdeveloped (Table 5 and 6). Most of the schools and health facilities were either severely damaged or destroyed completely—limiting the provision of health services in flood affected areas for a longer time. Roads and market infrastructure have been severely damaged affecting the supply of essential items. The people most severely affected were predominantly marginal farmers, small and unskilled workers (WFP, 2010). Most of the flood affected people lost their entire livelihood and currently dependent on food support—the majority of them will take long time to stand on their own feet. They are currently facing high food prices (Table 7) and are forced to unintended distress sale of animals at low prices. Loss in assets and infrastructure is resulting into un-acceptably low food intake, and inadequate diet and malnourishment of children. There are fears of rampant spread of human and animal diseases.

This implies that in the near future, food security issues shall be more serious in flood affected areas in general and in poor food insecure districts in particular. That may result into further rise in food prices. Maplecroft (2010) has recently computed food security risk index and ranked Pakistan at number 30—high risk among 163 countries, rank 1 being at the extreme risk which is Afghanistan. Security, high inflation, high food prices and poverty have played a dominant role in Pakistan’s ranking. The country will face a long term effects of such a devastating flood in the history of Pakistan on food security. The present situation justifies the introduction of effective measures for not only food distribution and marketing system in these areas but also needs urgent help in rehabilitation of farm lands and houses, provision of seed and implements, human and livestock health care with close monitoring not to let the poor suffer much from the after shocks of the flood till their own food production capacities and/or other livelihood are revived.

Table 5. Agricultural Damages Caused by Floods

Province	Severe affected (>60%)	Moderate affected (30–60%)
KPK	Swat, Charsadda, Nowshera, Upper Dir, Kohistan, Shangla, Tank and D.I. Khan	Rest of Khyber Pakhtunkhwa
Punjab	Muzaffargarh, Mianwali, Rajanpur, D.G. Khan and Layyah	Bhakkar, Khushab and Multan
Sindh	Khairpur, Shikarpur, Dadu, Larkana, Thatta, Jacob abad, Kashmore, Sukkur, Ghotki and Noshero Feroz	Qambar Shahdadkot, Sukkur, Jamshoro, Tando Allahyar and Hyderabad
Balochistan	Kohlu, Sibbi, Jafar abad, Nasir abad, Barkhan	Rest of Balochistan

Source: Presentation by FAO Representative at Pakistan, dated 8th September 2010

Table 6. Food Security Situation in Severely and Moderately Flood Affected Areas

Provinces	Overall (% population)	Severely affected (% population)	Moderate affected (% population)
Punjab	37.10	30.17	17.20
Sindh	33.42	34.36	11.49
Kyber Pakhtunkhwa	45.16	57.63	40.10
Balochistan	43.35	47.41	59.49
Total	38.45	37.18	29.05

Source: Estimates using district level population projections for 2008 and food security situation data from report on “Food Insecurity in Pakistan” by SDC/SDPI/WFP (2009).

Table 7. Increases in Prices after Floods in Percent (August compared with July 2010)

Commodity/ District	Kohistan	Lower Dir	Manshra	Swat	Kamber	Hyderabad
Wheat Flour	82	33	10	26	7	6
Broken Basmati Rice	87	--	7	33	-10	10
IRRI6-Rice .	--	25	6	38	12	19
Split peas	22	18	22	31	--	--
Edible oil	--	11	22	17	--	--
Pakwan Ghee	9	16	17	18	--	--
Dalda Ghee	--	9	5	--	--	--
Sugar	43	16	8	14	13	22
Onion	--	--	--	--	41	25
Chicken	--	--	--	--	65	69
Beef	--	--	--	--	9	25
Mutton	--	--	--	--	8	13

Source: WFP (2010)

4. Food Security Policies and their Implications

It is generally believed that there are *two major policy failures* that lead to uncertainty in food security and increase in poverty in the developing countries including Pakistan. These policy failures include hasty state withdrawal from the agriculture sector under the structural adjustment programs and paying no heed to setting up essential institutional infrastructure to exploit farm-nonfarm sectors’ nexus. This chaotic move resulted into reduced investment in research and development not only by the national governments of the developing countries but international donor agencies also withdrew their support to the rural sector in general and agriculture in particular (Zezza, *et al.*, 2007). As a result of non realization of intrinsically interlinked sectors and simultaneous policy moves—retreating from support without providing alternative pathways, agricultural productivity declined and incidence of rural poverty increased leading to greater reduction in access to food. That perpetuated further into poverty-food insecurity helix. Pakistan never had any national food policy except for a few food security programs at the regional levels. However, there are various food laws mainly dealing with quality standards that are too not properly defined (Mittal and Sethi, 2009).

Despite modest economic growth and reasonably enough food available at the national level, a large proportion of people are extremely poor and suffer from lack of food security in Pakistan due mainly to lack of purchasing power. Physical availability of staple and non-staple foods is influenced by the agricultural and trade policies, while economic access is determined by prices of food and non-food items as well as the level

and the sources of income. And, therefore, economic growth and social security policies are crucial in ensuring the entitlements to food and health, sanitation, and water (Bouis and Hunt, 1999).

Social protection covers both the safety nets and social security programs. World Bank¹¹ in its recent publication has classified the total spending on social protection in Pakistan in two broad groups: i) Safety nets which include cash transfers, social welfare services, human capital accumulation and wheat subsidies; and ii) Social security comprising public sector spending on civil services pensions, and private sector sponsored welfare fund and cost of employees social security institutions. Asian Development Bank¹² decomposed the social protection spending in Pakistan into much broader categories: i) labor market programs; ii) social insurance programs; iii) social assistance and welfare programs; iv) micro and area based schemes (community based); and child protection programs. Detailed discussion regarding these programmes in Pakistan is beyond the scope of this paper. However, we would touch upon briefly the safety nets in Pakistan.

Pakistan has a number of safety net programs implemented by various ministries. The main two cash transfer programs are: i) Pakistan Bait-ul-Mal¹³ implemented by Ministry of Social Welfare and Special Education. In July-March period, Pakistan incurred Rs.2.7 billion to 1.438 million beneficiaries in 2008-09, Rs.1.65 billion to 1.11 million beneficiaries in 2009-10 financial year and allocated Rs.2 billion for 2010-11 (Government of Pakistan, 2010ab¹⁴); ii) *Zakat*¹⁵ and Usher scheme administered by Ministry of Religious Affairs. In July-March period, Pakistan disbursed Rs.1.421 million to 0.538 million beneficiaries during 2008-09, Rs.0.404 million to 0.538 million beneficiaries in 2009-10 financial year. More than half of the *Zakat* fund is disbursed through regular *Zakat* programs (Government of Pakistan, 2010ab). In addition to this, other programs that are implemented include school feeding, safe motherhood and child nutrition, etc. These are implemented by provincial education and health departments, with the assistance of WFP, WHO, UNICEF and UNESCO. These programs provide assistance to about 2 million households. Recently, Government of Pakistan has introduced Benazir Income Support Program to cater the needs of the “poorest of the poor” sections of the society. Rs.46 billion were disbursed under this program during

¹¹Social Protection in Pakistan: Managing Household Risks and Vulnerability. World Bank, October 2007.

¹²Scaling Up of the Social Protection Index for Committed Poverty Reduction. Final Report. Volume 1. Multi Country Report, Halcrow China Limited. Prepared for Asian Development Bank, November 2007.

¹³Pakistan Bait-ul-Mal (PBM) disburses to the destitute, needy, widows, orphans, invalids and infirm irrespective of their gender, caste, creed or race. PBM provide assistance under different programs and schemes, such as Food Support Program (FSP) carrying major share followed by Individual Financial Assistance (IFA), International Rehabilitation through civil society wing, National Center for Rehabilitation of Child Labour (NCRCL), Vocational Training Institutes/Dastkari Schools (VTIs) (Government of Pakistan, 2010).

¹⁴Government of Pakistan, 2010a. “Pakistan Economic Survey 2009-10”, Economic Advisor’s Wing, Finance Division, Government of Pakistan, Islamabad.

Government of Pakistan, 2010b. “Budget Speech 2010-11”, Federal Budget Speech of Dr. Abdul Hafeez Sheikh, Minister for Finance, Finance Division, Government of Pakistan, Islamabad.

¹⁵*Zakat* provides financial assistance such as *Guzara* allowance, educational stipends, health care, social welfare/rehabilitation, Eid grants and marriage assistance through regular and other *Zakat* programs and national level schemes (Government of Pakistan, 2010).

2009-10, while Rs.50 billion are allocated under this scheme for the year 2010-11 (Government of Pakistan, 2010b).

The above mentioned cash transfer programs follow different modalities for identification of beneficiaries, targeting mechanism, coverage and outreach, due diligence and monitoring mechanism. A number of issues are worth noting in these programs: i) most programs are fragmented, duplicative and disjoint with no coordination mechanism; ii) they are thinly spread and have poor coverage, and often exclude marginal and people in remote areas; iii) at present, the main criterion used for identification of recipients is poverty which exclude transient poverty and vulnerable shocks particularly people with low human capital and access to productive assets; iv) absence of standardized eligibility criteria (operational definition) and lack of transparency in identification has lead to inclusion to ineligible and exclusion of needy and deserving; v) the payments are small, as they represent 10% to 20% of the consumption need to the household; vi) the disbursements are irregular and lumpy; and vii) the annual payments are not adjusted to inflation or cost of living (FAO, 2008).

On the supply side, various agricultural projects have been undertaken by the government of Pakistan and the productivity of food crops increased significantly as a result. These programs include development of irrigation, roads, market infrastructure, and investment in agricultural research and extension. The empirical studies has shown that investment in research and development has paid off in terms increasing agricultural productivity, raising family earning, nutrition which in turn supported raise labour productivity, and resulted in better health and well being of people. Keeping in view the importance of agriculture and ensuring food security on sustainable basis, the government of Pakistan started a Special Program for Food Security (SPFS) with major support from FAO. The SPFS project was piloted initially in three localities including two sites in Punjab and one in NWFP with twin objectives of: 1) to ensure the adequacy and access to food supply; and 2) to maintain the stability of the agricultural production—with a special focus on enhancing productivity and profitability of the major food crops (i.e. wheat, rice maize and oilseeds) on a sustainable basis. The project was first up scaled to 109 villages in May 2002 under the name of Crop Maximization Program (CMP) and then extended to more than 1000 villages all over Pakistan in 2008 totally sponsored by the government of Pakistan. The results of the SPFS were encouraging at two sites in Punjab on the basis of which 109 villages brought under this net under the name of CMP. The performance however of the CMP was dismal (Ahmad and Iqbal, 2006). Despite that fact, the CMP-II was initiated in more than 1000 villages all over Pakistan with a target to extend it to 13000 villages. The success of this program is also being seriously questioned by the stakeholders and the professionals.

The major focus of Pakistan's food security however remained on supply side that too mainly revolved around maintaining wheat self-sufficiency only. The production and marketing of other food crops is left on market forces. As wheat is the main staple, the government procures and maintains operational as strategic reserves of wheat and resells through flour mills after covering the cost of storage, handling, and other incidentals. The cost of subsidizing wheat is huge per annum. The leakages in the procurement system, storage and the milling sector have significant hidden costs. Given these leakages, the benefits accrued to intended beneficiaries is not commensurate with the subsidy involved.

Various food related subsidies were also provided for addressing the food security of poor urban sections of the society. Particularly during the periods of high food prices, the government provides subsidy on various food items that are sold through Utility Stores Corporation (USC) at subsidized prices. For this purpose, Rs.36.9 billion were spend on various food related subsidies during 2009-10, while Rs.27.044 billion are allocated for this purpose during current fiscal year (Table 8).

Table 8. Food Associated Subsidies (Million Rs.)

Classification in the budget	Budget 2009-10	Revised 2009-10	Budget 2010-11
Trading Corporation Pakistan on import of sugar	4000	4000	4000
Trading corporation of Pakistan on wheat imports	25500	25500	12000
Utility Stored Corporation for sale of Atta	1200	1200	-
Utility Stored Corporation for sale for Ramzan Package	1500	1500	700
Utility Stored Corporation for Ghee package	1000	1000	-
Utility Stored Corporation for sale of pulses, rice, tea	500	500	-
Utility Stored Corporation for sale of sugar	-	-	3500
PASSCO/Wheat Export/Miscellaneous	320	599	600
PASSCO for paddy operation	2000	1721	2000
PASSCO for mung operation	1	1	300
Sale of wheat in FATA	216	216	233
Sale of wheat, sugar etc. in Gilgit Baltistan	664	664	711
Storage expenses of wheat reserve stocks	-	-	3,000
Total	36901	36901	27044

Source: Government of Pakistan, 2010. "Budget in Brief 2010-11", Finance Division, Government of Pakistan, Islamabad.

Ahmad *et al.* (2006) evaluated various seasonal phases of wheat marketing over the period 1996-97 to 1999-2000, they analyzed quantities—production, home consumption, feed, seed, and wastage; government procurement and open market sales; imports and marketed consumption; prices—government support, issue price, wholesale price, import parity price, government’s import price; and costs—government storage cost and private storage cost. This partial equilibrium analysis showed that the total producer welfare loss was Rs.37.96 billion including policy cost to government amounted to Rs.11.05 billion. The overall financial loss was about Rs.3.37 billion, reflecting mainly the difference between gain to the millers, and the subsidy provided by the government—a gap apparently unaccounted for in the system. The study also highlighted the fact that the consumers are subsidized at the expense of the farmers, and the millers absorb almost all the subsidy provided by the government to implement wheat policy. The same study also argued that eliminating government interventions in wheat marketing would result in too high wheat prices to be affordable to the consumers, increase in production may not compensate to lower consumer prices, the loss in consumer surplus will be more than the producer gain, and all household groups will face lower welfare except the urban non-poor—indicating that the latter may find cheaper food substitutes.

Ahmad *et al.* (2010) concluded that marketing costs incurred by government-owned departments are significantly higher than that of incurred by the private traders. Corruption is pervasive in commodity marketing, particularly in the public sector. Rent-seeking activities increase transaction costs and uncertainty, discourage marketing

investment and participation—ultimately leading to negative fiscal impact for the government.

To supplement the above conclusions, we analyze the current government intervention in food marketing where government tried to achieve wheat self-sufficiency in 2008-09. The support price for wheat was raised from Rs.650/40kg to Rs.950/40kg besides providing heavy subsidy on fertilizer. Bumper wheat production of over 24 million tons was the result this policy. The government procured over nine million tons of wheat grains—highest in the history. The half of which was consumed in the following year, while over 4 million tons still remained with the government's stocking departments at the time of next wheat harvest during 2010. The wheat growers' pressure resulted into government procurement of about 6.7 million tons of more grains during 2010 wheat harvest season at the last year support price, which was significantly higher than the international price of wheat. This strategy was bound to fail—due to greater supply in the market and lower wheat prices across the border; however, it proved a blessing for the influential farmers having required surplus grain lots to sell to the government procuring departments. The majority of the farmers could hardly get wheat prices in the range of Rs.750 to Rs.850/40 kg. The market intermediaries—commission agents and other dealers, were able to manipulate and succeeded in supplying wheat at government procurement centers through underhand deals with the government procurement agencies' staff.

Wheat procurement during 2010 had built total reserves of 10.7 million tons with the PASSCO and PFDs despite the fact that that public storage capacity for food grains is hardly over 4 million tons. The total incidental expenses including interest on bank borrowing, gunny bags, transport, fumigation, private storage, losses etc. came to Rs.50 billion at the rate of Rs.5000/ton/annum for the year 2010-11.¹⁶ Since government provides wheat at subsidized price of Rs.800/40kg (or a subsidy of Rs.150/40kg) against procurement price to flour mills, the total subsidy can directly be transferred to flour millers that accounts to Rs.40.125 billion overburdening the government by Rs.90 billion. Multiple subsidies on wheat procurement, wheat flour, Benazir Income Support Program are unprecedented burden on government exchequer and need immediate correction through expanding targeted subsidies to poorest segment of the society. On international scene, the current wheat prices (US HRW–Gulf) prevails from US\$227/ton to US\$250/ton (or Rs.860/40kg) and with the freight charges of around US\$55/ton, the c.i.f. price comes at Rs.24252 to Rs.26230/ton (Table 9). Hence, from export perspective, as export parity price at Karachi are much higher than the import parity price, it is not feasible to export it without heavily subsidizing it through Trading Corporation of Pakistan. The huge subsidy of around 36 billion was estimated for exporting 2 million tones of wheat from Pakistan.¹⁷

¹⁶ PASSCO procured around one million tons of wheat with 1650 employees by charging around Rs.3500/ton that comes to 15% of wheat procurement price of Rs.23750/ton. High incidentals of Rs.2.50 per kg are charged including organization costs.

¹⁷ The government has cancelled the plan of exporting wheat due to devastating floods in Pakistan resulting into loss of significant quantity of wheat stored for consumption as well as for seed purposes.

Table 9: Import parity price of wheat on the basis of No.2 Hard Red Winter (Gulf) port

Items	Unit	July 30 th , 2010	July 23 rd , 2010
FOB (Gulf) Price ¹	US\$/ton	250	227
Incidental charges	US\$/Ton	55	55
Open market exchange rate	Rs./US\$	86	86
FOB (Gulf) Price	Rs./Ton	21500	19522
Incidental charges	Rs./Ton	4730	4730
CIF (Karachi) Price	Rs./Ton	26230	24252
Domestic transport & handling charges	Rs./Ton	5000	5000
Import parity price (Lahore)	Rs./Ton	31230	29252
Import parity price (Lahore)	Rs./40-kg	1250	1170
Procurement at Lahore @ Rs.950/40-kg	Rs./Ton	23750	23750
Procurement expenditures	Rs./Ton	5000	5000
Domestic transport & handling charges	Rs./Ton	5000	5000
Export parity or FOB (Karachi) Price	Rs./Ton	33750	33750

¹ Source: International Grain Council

The above discussion clearly indicates the following major flaws in the existing wheat prices and procurement policies: a) producers hardly benefit from these policies both in terms of sustainable increase in production and marketing at announced support prices; b) benefits to consumers were also partial, as the major chunk of benefit is siphoned by the flour millers; c) serious distortions in wheat and wheat flour prices through undue government interventions in terms of un-targeted subsidies; d) considerable inefficiencies in managing wheat surpluses as the quantities procured were beyond the storage capacities of the government departments—hiring private storage facilities at a huge cost to the nation; e) exchequer being additionally burdened by providing highly subsidized wheat flour to the public and “cheap bread” scheme of the Government of Punjab; f) policy has crowded out private investment in storage infrastructure; g) generated massive inefficiency in flour milling sector; and h) the target population is generally not effectively being dealt with and in particular the rural poor lack access to most of the safety nets.

5. Future Challenges

As discussed above both supply-side and demand-side issues of food security are the future challenges in the developing countries. Therefore, both challenges need to be addressed to ease food insecurity. Pakistan faces both of these challenges—loosing out food production potential, and access to food is also becoming a serious threat because high incidence of poverty both in urban and in rural areas. Government of Pakistan is mainly focusing on urban areas from food security perspective. It is difficult to effectively address both of these challenges simultaneously (UNCTAD, 2009). Pakistan has enormous potential to further develop its agriculture sector to which about 2/3rd of country’s population is directly or indirectly depends for livelihood. However, Pakistan economy is experiencing structural transformation and the role agriculture in economic development is changing fast—its share in overall output of the country is declining but labour stays back, and a very small proportion of farms experiencing fast modernization, while majority of the farmers are resource poor and loosing out even the existing potential. Therefore, Pakistan has to adapt three-prong strategy—develop farm and non-farm sectors as well as reducing polarization from within the agriculture sector by either helping the inefficient farmer to approach the frontier or helping them to find alternative

livelihood in the non-farm sector if so developed. We however, touch mainly the production side challenges in this section.

Assuming population growth continues at the present rate, Pakistan needs to increase its food production to feed a growing population with some modest surpluses for export. The fact is that to achieve this substantial increase in crop productivity is to be targeted using lesser land and water resources than are available for agriculture today. One is not sure of achieving individual milestones in the fast changing dynamic world, but one thing is to be believed that agriculture must maintain a growth rate of more than 5% in order to ensure a rapid growth of national income, attaining macroeconomic stability, effective employment of growing labor force, securing improvement in distributive justice and a reduction in rural poverty in Pakistan.

“Food security is possible well into the future. Science provides the tools, agricultural research the modality, intellectual insight the design of the next revolutions that will help smallholder farmers improve their square yard of earth, and help the world to keep pace with population growth”(Austin, nd).

5.1 Sources of Growth in Agriculture

Three major factors that influence the supply side of food include: 1) the higher use of conventional inputs—this pertains to the economies of size and indicates the movement of the producer along the best practice production frontier; 2) increase in total factor productivity (TFP) that refers to shifting of the production frontier upwards by R&D efforts; and 3) the targeted transformations in the institutional setup that assist the agriculture sector. These sources of growth are interrelated like compartments of the train pushing forward one another. The contribution of one is dependent on the effectiveness of the other.

Higher Use of Inputs and Farm Size: Two major *inputs* in agriculture are land and water. The potential of allocating more of these towards agriculture is limited. Rather, both land and water resources are facing declining trend in supply caused either by land degradation¹⁸ or due to fast and unplanned expansion of cities. The chances for bringing unused or marginal lands under cultivation are remote and uncertain: 1) the amount of such land to be used is disputed (Evans, 2009; Fullbrook, 2010); and 2) the quality of such lands is poor and the investment to increase productivity in these lands may be uneconomical and unsustainable (Fullbrook, 2010). The intensive use of land (cropping intensity) is another source of increasing agricultural output that too has reached even in the vicinity of 200% in certain irrigated areas indicating no chance of going beyond that. Similarly, the use of inputs like fertilizers and pesticides cannot be increased beyond certain limits because of national health and environmental concerns. Furthermore, due to increasing prices of fertilizer, energy and declining water availability the already declining rate of growth in use of chemicals has turned into negative in recent years. Alternative sources of nutrients would have to be explored and popularized. The use of

¹⁸ Because of poor response towards inputs applied in such lands, the farmers use lower doses of inputs as compared to normal healthy lands. Reduced levels of inputs use on such lands vary from 12% to 80%, and as a result from slight to moderately affected patchy lands agricultural output declined by more than 30% (see Ahmad, 2003).

biocides is observed to be declining in a number of countries and a few of them are even returning to organic farming. The other inputs include farm machinery—tube-wells, tractors and implements, the supply of which once increased significantly is now facing the rate of change in growth on the decline. The available farm machinery is more suited to large farms, and thus the farm machinery research has to be redirected to explore and improvise mechanization suited to small farmers (or reverse mechanization favoring small farmers). The machines required for harvesting and post-harvest handling and small scale value addition are either not developed or faulty or if developed could not be passed on to the end users.

As regards the *farm size*, Pakistan has a highly skewed distribution of farm lands. In 2000, about 58% of total farms were smaller than 5 acres in size cultivating only 16% of total farm area. In contrast, only 6% farms having more than 25 acres of land were operating 32% of the total cultivated area. The situation in some provinces is rather more serious. Basically the ownership of this major factor of production determines the access to input and output markets. Therefore, the benefits of agricultural development are also shared rather more unequally. The poor small farmers use 30% to 50% less of various factors of production than the use at the rich farmers—leading to lower land productivity, greater poverty and food insecurity. All inputs combined have been contributing towards agricultural output growth ranging from 25-50% during 1990s in Punjab (see Ahmad, 2003 and Ali and Byerlee, 2000). The above discussion highlights that there are only limited chances to increase the use of inputs in future and as a result increase the agricultural output—approaching upper bound through these resources.

Pakistan would have to depend more heavily on technological change and improvement of technical efficiency for the desired rapid agricultural growth in future years. Thus the agriculture is to become more technology driven and the economies of scale is to be seen a big challenge for smallholder agriculture. Contract and corporate structures, small and large farmers' cooperatives, and other innovative marketing strategies are seen to be the answer in future. Given these facts of agricultural system in Pakistan and having lost the opportunity of land reforms—the latter is not possible even in future considering the feudalistic mindset developed in political, industrial, services and the agriculture circles and the power of their pursuance. The exit of inefficient marginal/small farmers from agriculture and their absorption in other sectors have to be facilitated through rural industrialization.

Increase in Total Factor Productivity (TFP): TFP refers to shifting of the production frontier upwards in case of progress, and downwards as a result of regress. Research and development (R&D) efforts, flow of information, better infrastructure, availability of funds and farmers' managerial capabilities are the prime movers of TFP. Empirical studies show that the TFP estimates differ widely and range from 0.37% to 2.3% dominating the share of TFP in output growth. The studies have also shown the signs of declining TFP growth rates because of deteriorating land and water resources (Ahmad, 2003; Ali and Byerlee, 2000). There is strong empirical evidence that high levels of research and development (R&D) investments lead to high productivity and eventually to increased economic performance. A strong relationship between

agricultural output and outlays on agricultural research and extension exists in Pakistan—about 32 percent rate of returns on such investment has been observed (Khan and Akbari, 1986). Another recent study by Kiani *et al.* (2008) found that investment in agricultural research resulted in attractive returns in Pakistan ranging from 49-78%—highest returns of 57-88% in Punjab province followed by that in Sindh (24-48%). While R&D activities are important, these must be supported by favorable policy instruments, human resource development, necessary physical and institutional infrastructure etc.

“No country has been able to sustain a rapid transition out of poverty without raising productivity in its agriculture sector” Timmer (2005)

Targeted Transformations and Institutional Setup Assisting the Agriculture Sector: The third major factor that could be instrumental for agricultural growth is the policy targeted institutional changes including agricultural extension, education and credit, and improvement in the functioning of input and output markets (Saris, 2001). The existing institutions have further deteriorated the disparity between the rich/large and the poor/small farmers in rural Pakistan by offering greater access to influential and well-off farmers. Moreover, the agricultural price policies in Pakistan remained anti-producers and tended to slow down the growth. Under the Structural Adjustment and Stabilization Programs (SAP) the government of Pakistan removed all the subsidies during the 1990s resulting into many fold increase in input prices and thus greater cost of production—squeezing the profitability of the a sector in general and of poor farmers in particular. While implementing the directives from IFIs the state’s role was quickly reduced/withdrawn without redirecting enhanced public sector focus on rural development to neutralize the policy effects on agriculture. The negative effects became more pronounced when the private sector investments lagged behind as well.

5.2. Constraints

The major hurdle to develop the agriculture sector of Pakistan in general and food grains production in particular is the lack of holistic policy approach—intervening in one or more commodities leaving others on the behest of market forces used to result in frequent supply and demand imbalances in other commodities—efforts in correcting these divergences turned often bad for the others. Such partial policy dynamics reduced the process of commercialization and specialization in agriculture by exploring the comparative advantage influenced by the market forces. All this resulted into slower growth in agricultural productivity, particularly in food grains. The analysis of a recently published study by Falkenmark, Rockström and Karlberg (2009) presents a very bleak picture for Pakistan in terms of water shortage and potential of increasing food production through expansion in area by 2050. In terms of area, very low potential left since most arable land is already in use, while the freshwater will be the most fundamental constraint in food production in coming decades—Figure 1 shows Pakistan in dark red. The study further concludes that Pakistan is among those countries that are *“approaching the end of the road unless income growth in the meantime allows them to import the food required”* (P65).

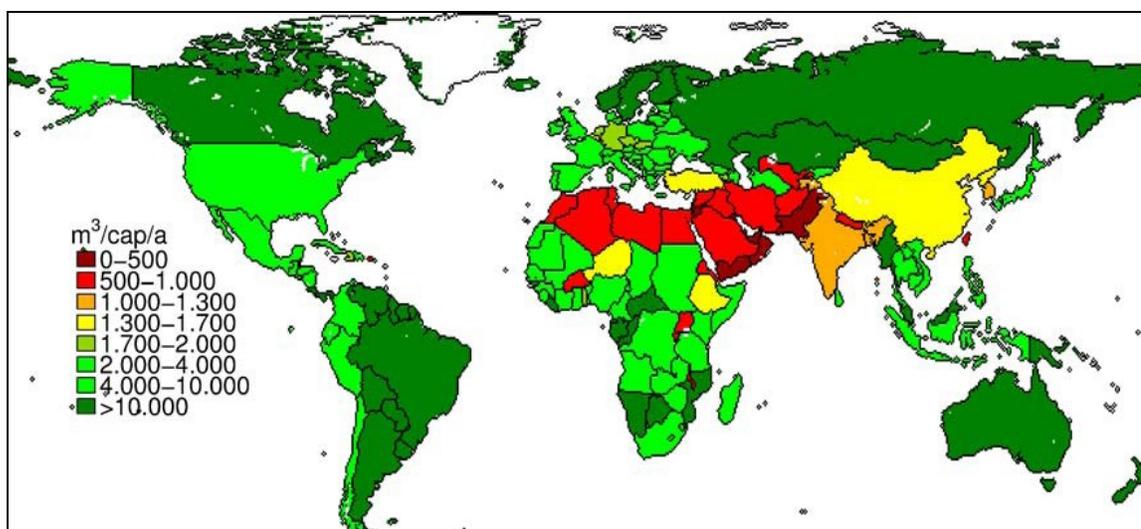


Figure 1 Countries colour coded according to water availability for food self-sufficiency. Those with <1,300 m³/capita/year are in deficit. Details can be seen from Rockström et al. (2008) cites in Falkenmark, *etc* (2009)

Other constraints/factors influencing food security in Pakistan—that are the outcomes of both partial policies and the neglect of R&D activities, include: a) fluctuating food grains production—generally below the domestic requirements; b) the slow pace of varietal development in pulses, oilseeds and fodder crops with non-existence of seed marketing system of these crop groups; c) the almost dependence of vegetables sector on imported seed; d) poor marketing infrastructure unable to insure timely availability of quality inputs—majority of the farmers ended up operating in low input–low output syndrome;¹⁹ e) low genetic potential of available varieties and slow varietal replacement because of unaffordable high prices of certified seed; f) presence of serious governance issues in food procurement and distribution system; g) inability of poor farmers to respond to food price hikes due to simultaneous rise in input prices and having no or very small marketable surplus available with them on output side to finance to²⁰; and h) the diversion of food items to producing bio-fuel is adding another dimension to food security.

6. Way Forward

“A precautionary approach would put food first because if it is not secure, even sovereign, then the security of society is put at risk. Putting food first,

¹⁹ Major area of wheat now falls in rotation of various *kharif* crops like cotton, rice, sugarcane. A period of 1-4 weeks is available to the farmers between harvesting *kharif* crops and wheat planting. During this period farmer is pretty busy in disposing off previous crops as well as struggling for procuring inputs for wheat while market intermediaries (commission agents) do not clear their accounts on previous crops or delay the payments of their sale proceeds. Shortages in the availability of inputs like seed and phosphatic fertilizer finally converge at using low quality and levels of these vital inputs.

²⁰ Most of the food marketable surplus is generated by medium and large farmers. This is because 58% of farming population operates <5 acres of land and they are cultivating only 18% of total cultivated area. The farmers having 5 to 12.5 acres represent 28% of farming population and operate 30% of total cultivated area. In this way, farmers operating <12.5 acres represent 86% farmers and are cultivating 48% of total cultivated area in the country.

will require the reordering of priorities and recognition of the fundamental value of food in securing life and supporting society. As food secures life and the mission of national security is to secure society and defend its existence, it follows that food forms an intrinsic element of national security but one that is generally overlooked.....Putting food first will strengthen the security in food security, thereby contributing to the comprehensive, sustainable security and well-being of citizens and society” (Fullbrook, 2010; P.7).

The major hindrance in the way of achieving food security in the developing countries including Pakistan is the high levels of poverty, and thus reduction in poverty is a most powerful tool to improve food security that can be achieved through equitable economic growth (Smith, et al, 2000). Smith *et al.* (2000) further suggests various ways to achieve pro-poor growth: 1) by enabling the poor to participate in the growth process and increasing their access financial and productive resources and providing them physical and market infrastructure; 2) investing in the human capital of the poor—provision of health and education that enables them to take advantage of new opportunities; and 3) investing in the social capital of the poor—network, norms, and trust among members of communities that help coordinate and cooperate for members’ mutual benefit in the community (Moser, 1996). In Pakistan most of the poor live in rural areas and are directly or indirectly dependent on performance of the agriculture sector. Besides improving food security of urban population, food security of rural households can be improved by increasing agricultural productivity.

In order to do so, a number of services and support institutions need to be strengthened or to be created including developing IPRs for promoting R&D in private sector. The goals and priorities of the central research have to be changed—both at the federal and provincial levels. An infrastructure of experiment stations in various ecological zones in partnership with the progressive farmers—small, medium and large, to evaluate the adaptability/applicability of the innovations under local conditions need to be developed. And the same stations should be used as hub of trainings of extension people and farmers. The focus of commodity research needs to be shifted to system perspectives in order to enhance research impacts and income of the farming community.

Research policies have to be focused on cropping zones and their development to increase systems profitability—no egalitarian approach of one-size-fits-all. Basic and applied research including social sciences has to be focused on cropping systems/zones, since the zones are very heterogeneous in characteristics and the issues/problems differ significantly from each other. Moreover, the focus of commodity research needs to be shifted to system perspectives in order to enhance research impacts and income of the farming communities. In order to adopt this model, we have to reassess human resource requirements, research and extension infrastructure, and more importantly the academic curricula in the universities.

New program interventions particularly in remote areas for training technicians in agriculture and non-agriculture enterprises need to be initiated. Training of technicians can bring revolution in agriculture as well as in non-agriculture sectors. This is expected to increase access to food and help reduce food insecurity. In addition to human development, a well organized food assistance program in food insecure and low

agricultural potential areas would enormously help reduce poverty and enhance access to food (Smith *et al.*, 2000).

For all this to happen, the federal and provincial ministries have to redefine their boundaries since these issues are provincial subject. The policy-makers need to think and establish system perspectives linking agriculture and non-agriculture sectors. This requires a close cooperation in policy and program formulation and implementation between Agriculture and other Ministries to foster rural and agriculture development in general and food sector in particular. For example, for proper program planning, formulation and implementation the ministries of agriculture, local government, water and power, and the environment cannot work in isolation.

All national policy initiatives must be scrutinized for their impacts on private sector investment as well as on rural wellbeing including farm and non-farm sectors.²¹ Realizing the farm-nonfarm nexus, appropriate institutional set up for coordination has to be set in place. Further, the financial institutions providing agricultural credit and microfinance need to be geared in favour of resource poor farmers and landless dominating not only the agricultural production system but also most of them are extremely poor and food insecure.

Socio-economic research could play a vital role in putting research on track for delivering specific outputs that are expected from the agricultural research system. For this purpose social sciences may be strengthened to assess research outputs in terms of sustainability, relevance/equity, quality, comparative advantage, competitiveness, value addition, resource conservation and profitability. Agricultural research system is still deficient in quickly aligning itself to the changing market situations and achieving sustainable higher quality production levels—particularly food commodities. Research planning lacks focuses on prioritizing research, strategic planning, implementing demand driven research, independent assessment of research outcomes, planned promotion of viable research outcomes and developing public-private partnerships to promote/upscale technologies. Following are the priority research areas to be focused on:

- developing technologies both in terms of genetic modifications of crops that improve water productivity and bring breakthroughs in the use of saline water;
- improving farming systems productivity by adopting practices such as conservation tillage, soil fertility management, soil and water conservation, water harvesting, and integrated pest management, etc;
- cropping system based research to adjust to the climate change processes and combating natural resources degradation and improving system productivity;
- identification of factors responsible behind yield gaps and finding solutions to resolve stagnating productivity in different production systems;
- research in human food-safety issues in plant and animal origin food chain;
- developing technological packages to achieve low-cost and high quality products;

²¹ This is called rural lens approach in Canada and in UK rural proofing (OECD, 2007)

- enhancing balanced use of fertilizer and increasing organic matter availabilities;
- encouraging small farmers' oriented corporate farming; and
- evolving new production packages and technologies that not only to enhance plants nutrient management but also create a balance of nutrients required for better human health.

A few institutional initiatives may be undertaken immediately including:

- strengthening and reorganizing Agricultural Policy Institute (API) so that this can handle macro level research issues, particularly trade and policy analysis, besides farm economic analysis;
- strengthening the existing Economic Research Institutes at the provincial levels with additional mandate of food policy analysis—establishing the new ones where they do not exist.
- establishing a Centre of Excellence in Food Security and Policy Research (CEFSPR) with an additional mandate of initiating degree programs in Food and Agricultural Policy; and
- establishing a "National Commission on Farmers (NCF).

Role of the Government

- Government should be proactive to the commodity crisis rather than act when the crisis already happened.
- There should be systematic commodity forecasting mechanism so that food demand-supply mechanism could more effectively be managed.
- A separate food security fund should be created, rather than diverting development resources in case the food production is below the national demands.
- Government may protect price bands in between import and export parity prices, rather than pan-territorial pricing that crowded out private sector.

7. Concluding Remarks

Reducing poverty, hunger and food insecurity are essential part of Millennium Development Goals. Pakistan is a low income developing country and agriculture is its most important sector due to its primary commitment of providing healthy food to her fast growing population. In Pakistan, the total cultivated area has increased by just 40% during past 60 years, while there was more than 4 times increase in population with urban expansion of over seven-fold—resulting into mega-cities as well as rising population pressure on cultivated land. Despite that wheat production has increased by five-fold, the country is still marginal importer of wheat. Tremendous efforts are needed to narrow the gap between population growth and domestic food production. Managing food security in Pakistan requires an understanding about how agricultural policies affect food supply and incomes, the poor vulnerable in rural and urban areas, and how this burden is transferred to other sectors. The main focus of this paper is to trace the pathways to achieve food and nutritional security for a growing population in Pakistan.

Unfortunately, the policy makers are only concentrating on attaining and maintaining self sufficiency in wheat production. Periodically, strong interventions are made in terms of significant increase in wheat support prices along with subsidizing fertilizer prices to achieve bumper wheat crop. Such interventions seriously distort relatively profitability of cultivation of other food crops of *rabi* season, e.g. other coarse grains, pulses and oilseeds. This paper discusses the nature of Pakistan's future food security in detail.

The recent incidence of country wide floods has not only caused more than Rs.250 billion worth loss to cash crops of the kharif season (maize, rice, sugarcane and cotton) costing to the nation, it has also seriously affected overall food security of the country as rural households' food reserves were either seriously spoiled or destroyed. It is worth mentioning here that the incidence of flood took place in the areas where overall food insecurity was relatively more serious.

On the other hand, the way government is managing procurement and distribution of food crops for low prices of wheat flour like offering wheat flour at subsidized prices, income support, cheap bread on *tandurs* etc., which has heavily burdened the national exchequer as well as encouraged development of different cartels and mafias, e.g. wheat flour industry, poultry hatchery and feed industry, etc.

A number of real world challenges and constraints have been highlighted for facilitating policy makers in designing a comprehensive food security policy for this country. In the way forward, some recommendations are made along with highlighting the need of new institutions for developing a R&D based infrastructure as well as defining the role of the government in food sector of Pakistan.

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