

Rehabilitating Agriculture and Promoting Food Security After the 2010 Pakistan Floods: Insights from the South Asian Experience

PAUL DOROSH, SOHAIL J. MALIK, and MARIKA KRAUSOVA

The 2010 floods in Pakistan had a devastating effect on the Pakistani population. This paper summarises recovery experiences from previous natural disasters in South Asia, including the 2005 earthquake in Pakistan and the 1998 flood in Bangladesh, and suggests several lessons relevant for recovery efforts following the 2010 Pakistan flood. First, market and trade policies should maintain adequate price incentives so that private trade and imports can contribute to post-disaster recovery. Second, a strong institutional framework is needed to coordinate the large-scale disaster response. Third, recovery efforts should also include support for livelihood security and restoration, ensuring inclusion of the stakeholders. Fourth, restoring and upgrading infrastructure facilities can lead to enhanced flood resistance as well as a reduction in future disaster loss. Two alternative institutions may be possible vehicles for poverty-alleviation—the Pakistan Poverty Alleviation Fund (PPAF) and the Benazir Income Support Programme (BISP). To address future disasters, however, it is important to establish and strengthen disaster response capability, including applying lessons learned from the relief and rehabilitation response to the 2010 floods.

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1. INTRODUCTION

The 2010 floods in Pakistan, which began in the northern part of the country in late July and gradually spread south along the Indus River basin in August, were devastating in terms of the loss of life and other damage. As of early September, 1,677 flood-related deaths had occurred, and by one estimate, \$6.5 billion worth of damage to crops, housing, other buildings, roads, and irrigation infrastructure had been incurred [OCHA (2010)]. Moreover, there remain serious concerns about rural livelihoods in heavily flooded areas with damaged infrastructure, potential problems with planting of the *rabi* (winter) crop if flood waters are slow to recede, the spread of water-borne disease, and absence of food security for the poor.

There is an increasing consensus that flood recovery and rehabilitation efforts have to take a multi-sector development approach. Severe floods affect not only the country's infrastructure but also the education, health, water and sanitation, transportation, communications, agricultural, trade, and industrial sectors. Though the differences between the current Pakistan flood and other floods in Pakistan and elsewhere in South Asia are many, one can nevertheless glean important insights from other experiences, particularly the massive flood in Bangladesh in 1998. The designs and evaluations of past flood prevention and rehabilitation projects in Pakistan and elsewhere in South Asia can also suggest useful approaches to an effective response to the 2010 floods.

Paul Dorosh <p.dorosh@cgiar.org> is Director, Development Strategy and Governance Division, International Food Policy Research Institute, Washington, DC. Sohail J. Malik <sjmalik@aol.com> is Chairman, Innovative Development Strategies (Pvt.) Ltd. Islamabad. Marika Krausova <m.krausova@cgiar.org> is Research Analyst at the Development Strategy and Governance Division, International Food Policy Research Institute, Washington, DC.

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In this paper, we group these lessons into four broad categories: market and trade policies; institutional framework and sources of financing; livelihood support programmes and welfare transfers; and rehabilitation of agriculture and infrastructure. We summarise the major insights that may be relevant to Pakistan's post-flood rehabilitation efforts. We also look at the existing national and sub-national authorities involved in disaster management as well as other possible mechanisms by which disaster rehabilitation funds and efforts can be channelled. We discuss their possible roles in the delivery of poverty-alleviating interventions and resources. In the final part of the paper, we address the implementation challenges that can hinder the stakeholders' ability to undertake the reconstruction and rehabilitation efforts.

The following section presents a brief overview of the 2010 Pakistan flood, highlighting the effects of the flood on agriculture and food security. Section 3 discusses other floods in South Asia, focusing on research and policy insights, as well as lessons from the experience of other flood relief and rehabilitation projects. Section 4 provides a brief description of Pakistani institutions that may play a key role in flood rehabilitation. The last section gives a brief summary of the findings.

2. THE 2010 PAKISTAN FLOODS: DAMAGE AND THREATS TO AGRICULTURE AND FOOD SECURITY

The 2010 Pakistan floods are the direct result of extraordinarily heavy monsoon rains in July and August, though other factors, including deforestation in upland areas and inadequate drainage, have played a role as well. The floods have affected far more people (18.7 million) than other recent natural disasters in Pakistan such as the October 2005 Pakistan earthquake (3.5 million), the Nargis cyclone of May 2008 (2.4 million), or the December 2004 Indian Ocean tsunami (2.3 million) (Table 1). The number of deaths (about 1,700 people), however, was far lower than from the 2005 earthquake (about 73,300 people) or the tsunami (about 230,000 people).

In comparison with other recent floods, the 2010 flood has displaced far more people, about 18 million; this is more than four times the number of people displaced by the 1992 flood (about 4 million), which was the next largest Pakistan flood since 1985 (Figure 1).¹ Floods in other parts of South Asia, especially in Bangladesh and India, often displace far greater numbers of people. The total number of displaced people due to floods in South Asia has exceeded 20 million people in six of the past 25 years. Moreover, as Table 2 shows, the floods have caused very substantial economic losses. Those include losses of nonagricultural businesses (\$0.3 billion) and housing (\$3.6 billion) in both rural and urban areas as well as damage to agricultural and nonagricultural infrastructure (not included in the table).

Other recent floods in Pakistan affected wider areas than did the 2010 flood even though they displaced fewer people. As Figure 2 shows, floods in 1992, 2003, and 2005 each affected more than 400,000 square kilometers, as compared to less than 200,000 square kilometers for the Pakistan flood of 2010.²

¹See Appendix A for a summary of major floods in Pakistan from 1985 to 2010.

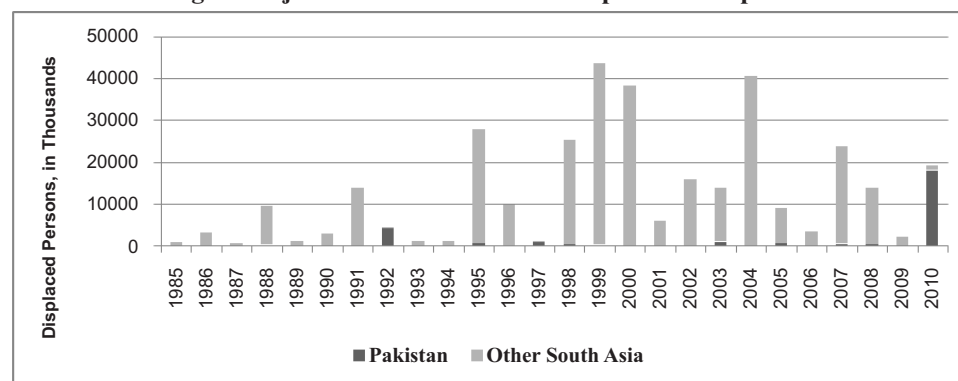
²One reason for the greater number of displaced people in 2010 is that heavy floods this year have inundated urban areas. The increase over time in the number of people who have settled in the katcha areas (areas alongside the banks of canals and rivers) is another factor.

Table 1
Pakistan 2010 Flood Comparison with Other Recent Natural Disasters

	Flood Pakistan	Earthquake Pakistan	Katrina Cyclone USA	Nargis Cyclone Myanmar	Tsunami Indian Ocean
	(Aug. 2010)	(Oct. 2005)	(Aug. 2005)	(May 2008)	(Dec. 2004)
Population Affected (Million)	18.7*	3.5	0.5	2.4	2.3
Area Affected (Thousand sq. km.)	132*	30		23	
Deaths	1,677*	73,338	1,836	84,537	230,000
Injured	2,605*	128,309		19,359	125,000
Households Damaged (Million)	1.25*	0.60		0.45	
Estimated Economic Damage (Billion US\$)	6.5**	5.2	125.0	4.0	7.8

Sources: * Relief Web (2010): Information as of September 4, 2010; ** Authors' estimates based on area data from OCHA (2010).

Fig. 1. Major Floods in South Asia: Population Displaced



Source: Dartmouth Flood Observatory (2010).

As Table 2 shows, the damage to agricultural crops, livestock, irrigation systems, and infrastructure has been substantial, though it has varied across regions due to differences in agroecology and other factors. Most of Pakistan's agriculture is concentrated in the Indus River basin, the world's largest irrigation network, and is irrigated through an extensive canal system, often supplemented with groundwater (typically pumped with small-scale tube wells).³ The floods have caused extensive damage in these regions to the major monsoon season (*kharif*) crops: *basmati* rice in northern Punjab and cotton in southern Punjab and northern Sindh. In the generally hilly and mountainous regions of the northern province of Khyber Pakhtunkhwa (formerly North-West Frontier Province) and similar non-

³See World Bank (2007) for a recent succinct review of Pakistan's agricultural sector.

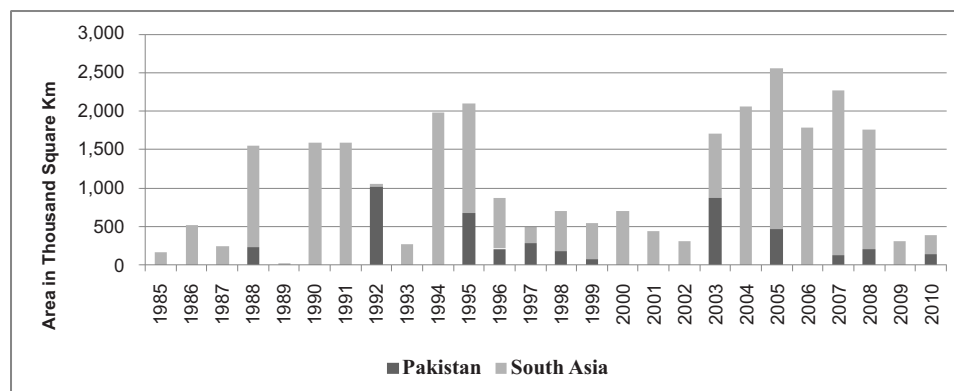
Table 2
Impact of the 2010 Floods

	Khyber Pakhtunkhwa Rural	Punjab Rural	Sindh Rural	Balochistan Rural	All Pakistan Urban	All Pakistan Total
Agroecology	<i>Barani</i>	<i>Barani</i> (Mainly in North) and Canal Irrigated	Canal Irrigated	<i>Barani</i>		
Major Crops	Wheat, Maize	Wheat, Rice, Sugarcane, Cotton	Wheat, Rice, Sugarcane, Cotton	Wheat, Rice		
Impact of Floods*						
Deaths	1,121	103	151	48	—	1,677
Injured	1,165	350	845	98	—	2,605
Houses Damaged (Thousands)	192	500	470	75	—	1,248
Population Affected (Million)*	4.3	8.2	4.7	1.0	—	18.3
Crop Area Affected (Thousands Ha)	443	1,516	998	627	—	3,676
Flood Damage by Type (Million US\$)**						
Crops	192	1,658	838	233 269	—	2,957
Livestock	65	—	233	144	—	441
Residential Property	1,151	828	84	81	1,491	3,634
Nonagricultural Establishments	—	—	—	13	220	233
Nonagricultural Equipment	—	—	—	2	60	62
Total Damages	1,371	2,031	873	509	1,771	6,555

Source: * OCHA (2010) as of September 4, 2010; ** Authors' estimates based on area data from OCHA (2010).

Notes: Crop area is defined as land of which at least 60 percent is cultivated. *Barani*: nonirrigated. Totals for Pakistan include Azad Jammu and Kashmir, and Gilgit-Baltistan.

Fig. 2. South Asia Major Floods: Area Affected



Source: Dartmouth Flood Observatory (2010).

irrigated (*barani*) areas of northern Punjab, most of the agricultural land is not irrigated. Here, the floods have also caused substantial damage to maize and other crops.

Pakistan's most important food staple, wheat, is cultivated in the winter season (*rabi*), in the *barani* areas of Khyber Pakhtunkhwa and northern Punjab as well as in the irrigated Indus River basin areas of northern Sindh. How the floods will affect the *rabi* wheat crop, to be planted in October through early December, remains uncertain. In some areas, floodwaters may have deposited sediments that add to soil fertility and thus may actually lead to increased yields. Wheat cultivation in other areas could suffer, however, due to damage to irrigation infrastructure and roads, as well as farmers' losses of seeds, tools, and machinery.⁴ Further south, in southern Sindh, drainage problems limit cotton cultivation and the warm nighttime temperatures make the area unsuitable for wheat cultivation. Here, ordinary (nonaromatic) rice is cultivated as a *rabi* crop. The other major crop in Pakistan, sugarcane, is grown almost exclusively on irrigated land and typically remains in the field nine to 15 months.

The 2010 floods caused extensive damage to monsoon season (*kharif*) crops, mainly cotton, rice, sugarcane and vegetables, which were still standing in the fields in August and early September. In August, OCHA and FAO estimated the crop area damaged at 3.58 million hectares (Table 3). Though the flooding initially began in the northern parts of the country, particularly in Khyber Pakhtunkhwa, the crop area affected (400,000 hectares) in those less densely populated, hilly areas was far smaller than in the more densely populated and more intensively cultivated, (mainly) irrigated Punjab (1.5 million hectares).

In October, the Pakistan Agricultural Research Council (NRD-PARC) released their own independent estimates of the crop area damaged by the floods. The total estimated crop area affected was sharply lower than the initial OCHA estimates of 3.6 million hectares: 1.3 million hectares [NRD-PARC (2010)]. Subsequently, on October 30, the World Bank, Asian Development Bank and the Food and Agriculture Organisation [World Bank/ADB/FAO (2010)] released the results of the Pakistan Flood Damage and Needs Assessment estimating the crop area damaged at 2.1 million hectares resulting in the loss of 7.5 million tons of sugarcane, 2.5 million tons of rice, 0.8 million tons of vegetables, 0.7 million tons of cotton and 0.3 million tons of maize. As seen in Table 3, compared to the early September 2010 OCHA estimates, the October 2010 estimates for crop area damaged dropped most sharply for Balochistan—from 628 thousand (OCHA) to only 74 to 132 thousand hectares (NRD-PARC and WB/ADB/FAO). For Sindh, estimates of crop area damaged fell from 999 thousand hectares (OCHA) to only 362 thousand hectares (NRD-PARC), but increased to 1.04 million hectares in the WB/ADB/FAO estimates. Area damage estimates changed less for Punjab and KPK, but even in these cases the NRD-PARC and WB/ADB/FAO estimates of October 2010 were less than half the early September OCHA estimates.

Alternative estimates of the flood damage to crops were constructed using household survey data from the 2007–08 Pakistan Household Income and Expenditure Survey (HIES; Table 4) and the initial OCHA figures for area damaged.⁵ Assuming a 20 percent loss in crop output, and using the mean crop land productivity by province from the HIES, the value of

⁴Note that in Bangladesh, the winter season crop of rice following a major monsoon season flood has typically been much larger than in preceding years, most likely due to a combination of improved price incentives and deposits of nutrient-rich sediments [del Ninno, *et al.* (2001)].

⁵The 2007–08 HIES is a nationally and province level representative survey of 15,453 households covering information about households' income and expenditures. The HIES also includes detailed information about households' crop and livestock production, consumption and expenditures which enable the calculation of household level crop land productivity levels for individual provinces.

crop losses is estimated at 118 billion Pakistani rupees (PKR) (\$1.4 billion). Using the median crop land productivity by province as a base (which effectively gives less weight to the highest-productivity farms), the estimated loss is 101 billion PKR (\$1.2 billion). Alternatively, a 50 percent crop loss would imply losses of 294 billion PKR (\$3.5 billion) based on mean land productivity and 251 billion PKR (\$3.0 billion) based on median land productivity. These latter figures for yield losses are slightly higher than the NRD-PARC estimate of \$2.15 billion released mid-October, but significantly lower compared to the \$5 billion crop losses estimated by the WB/ADB/FAO (Table 3).

Reduction in agricultural incomes will likely lead to lower spending on rural non-farm goods and services (processing, marketing, rural services, and so on), and thus reduce rural non-farm incomes as well. These multiplier effects can be quite large, equivalent to an extra 1.5 PKR of lost non-farm income for a 1 PKR loss in crop incomes.⁶ Further, a significant wheat supply reduction (and increase in the wheat price) would have major adverse effects on most Pakistani households. Wheat accounts for 23.0 percent of food expenditures for the poorest 20 percent of households in both urban and rural areas, and 14.9 percent of food expenditures nationally for all household groups (127 PKR/person/month

Table 3
Alternative Estimates of the 2010 Pakistan Flood Impact on Agriculture

	Date of Estimate	Province				
		KPK	Punjab	Sindh	Balochistan	Pakistan
Crop Area						
Damaged						
(Thousands Ha)						
OCHA/FAO	4-Sep-10	443	1,517	999	628	3,676
NRD-PARC	15-Oct-10	169	953	362	74	1,558
WB/ADB/FAO	30-Oct-10	121	746	1,043	132	2,093
Crop Losses						
(Billion US\$)						
IFPRI	4-Sep-10	0.19	1.66	0.84	0.23	2.96
NRD-PARC	15-Oct-10	0.35	1.01	0.64	0.15	2.15
WB/ADB/FAO	30-Oct-10	0.28	1.75	2.11	0.26	5.04
Livestock Damage						
(Billion US\$)						
IFPRI	4-Sep-10	0.07	—	0.23	0.14	0.44
WB/ADB/FAO	30-Oct-10	0.11	0.09	0.19	0.17	0.57
Total Agriculture						
Damage (Billion US\$)						
IFPRI	4-Sep-10	0.26	1.66	1.07	0.37	3.40
WB/ADB/FAO	30-Oct-10	0.40	1.84	2.30	0.43	5.04*

Source: OCHA (September 4, 2010), NRD-PARC (October 15, 2010), IFPRI (September, 4, 2010), WB/ADB/FAO (October 31, 2010).

Notes: IFPRI calculations based on crop area damaged data from OCHA (2010); WB/ADB/FAO and IFPRI totals of crop area damaged and crop loss estimates include AJK and Gilgit-Baltistan; *WB/ADB/FAO Total agriculture damage includes fisheries.

⁶Dorosh, Niazi, and Nazli (2003).

Table 4
Alternative Estimates of the Value of Agricultural Crop Losses from the 2010 Pakistan Floods

Province	Affected Area (Thousands Ha)	Mean Land Productivity (PKR/Hectare)	Median Land Productivity (PKR/Hectare)	20% Crop Loss at Mean Land Productivity (Billion PKR)	20% Crop Loss at Median Land Productivity (Billion PKR)	50% Crop Loss at Mean Land Productivity (Billion PKR)	50% Crop Loss at Median Land Productivity (Billion PKR)
Punjab	443	11,501	10,136	64.0	56.4	160.0	141.0
Sindh	1,517	11,883	11,441	29.6	28.5	74.0	71.2
Khyber Pakhtunkhwa	999	11,150	8,805	8.3	6.5	20.7	16.3
Balochistan	628	14,287	7,917	14.3	7.9	35.8	19.8
Azad Jammu and Kashmir	80	11,150	8,805	1.4	1.1	3.4	2.7
Gilgit-Baltistan	10	11,150	8,805	0.2	0.1	0.4	0.3
All	3,676	11,847	10,122	117.7	100.5	294.2	251.3
Billions US\$	n/a	n/a	n/a	1.38	1.18	3.46	2.96

Source: Authors' estimates; affected area data are from OCHA(2010).

Notes: Mean and median land productivity are calculated from HIES (2008) data. PKR: Pakistani rupees.

out of a total food expenditure of 850PKR/person/month; Table 5). In quantity terms, wheat and wheat flour consumption is about eight times larger than rice consumption nationally (7.8 kilograms/person/month for wheat and wheat flour, compared with 0.9 kilograms/person/month for rice; Table 6). A reliance on wheat as the major staple food is especially great for rural households, particularly the rural poor, for whom wheat consumption (7.2 kilograms/person/month) is about 10 times greater than rice consumption (0.7 kilograms/person/month). As discussed below, changes in trade policy could help stabilise wheat prices in the event of a major wheat production loss.

Livestock loss data are currently unavailable for Punjab, but estimated livestock losses in Sindh and Khyber Pakhtunkhwa are available and are equivalent to 42 percent of crop losses (Table 2). Assuming the national average of livestock losses for all affected areas in Pakistan (including Punjab) is equal to 40 percent of crop losses gives a livestock loss of 74.3 billion PKR (\$870 million). Alternatively, using the HIES-derived estimates, if the livestock loss is 40 percent of crop loss, the estimates range from 40 to 188 billion PKR (\$0.47 billion to \$1.38 billion). Total agricultural loss would then be 141 to 352 billion PKR (\$1.7 billion to \$4.8 billion).

3. RESPONDING TO NATURAL DISASTERS IN SOUTH ASIA

In recent years, there has been a gradual shift away from dealing with floods as stand-alone events to managing the recovery and rehabilitation efforts as part of a multisector development approach. Increasingly greater attention is being placed on mitigation, preparedness, and socioeconomic and political factors [PAHO (2000)]. There is a growing consensus that the flood policy context must include multidisciplinary, multisector, multistakeholder participation as well as initiatives to address the flood environment characterised by the transboundary nature and influences of an integrated water system [ADPC/UNDP (2005)]. The experience of recovery from previous major natural disasters in Pakistan and throughout South Asia offers numerous lessons that may be relevant for post-2010 Pakistan flood rehabilitation and recovery efforts.

The discussion below groups these lessons in four major categories: market and trade policies; institutional framework and sources of financing; livelihood support programmes and welfare transfers; and rehabilitation of agriculture and infrastructure. Many of the lessons derive from the disaster recovery efforts after the 2005 earthquake in Pakistan and the 1998 flood in Bangladesh, a flood of comparable extent and duration to the present Pakistan flood.⁷

Market and Trade Policies

Immediately following a major natural disaster, there are often major disruptions to roads, port facilities, transport services, physical market structures, and both internal and external trade flows. Households that lost livelihoods face serious problems related to lack of access to food, safe drinking water, and proper sanitation facilities. In the relief operations immediately after the disaster strikes, government agencies, international agencies, and

⁷In 1998, Bangladesh suffered a major flood in which, at its peak in early September, floodwaters covered two-thirds of the country. More than 20 percent of the monsoon season (aman) rice crop was destroyed (more than 2 million tons of rice), road infrastructure was badly damaged, and many landless rural poor households suffered losses of wages [Dorosh (2001)]. There are, of course, major differences between the 1998 Bangladesh floods and the 2010 Pakistan floods, including the much greater damage to irrigation infrastructure in Pakistan and the substantially larger safety net system already in existence in Bangladesh at the time of the 1998 floods.

Table 5
Food Expenditures (PKR/Capita/Month):
Pakistan HIES 2007-08, by Total Expenditure Quintiles

Pakistan						
	Total	1st	2nd	3rd	4th	5th
Wheat	127	110	125	132	135	132
Rice	36	21	29	32	41	57
Other Cereals	3	1	2	3	4	5
Pulses	20	13	17	19	23	28
Fruits (Fresh and Dried)	32	9	16	24	35	78
Vegetables	67	45	55	65	75	97
Milk and Dairy	213	92	142	184	249	398
Meat Poultry and Fish	47	17	28	37	48	104
Fish	6	3	4	5	5	12
Edible Oils and Fats	99	66	81	94	113	140
All Food Items	850	483	642	768	941	1,414
Urban Pakistan						
Wheat	113	104	110	113	115	115
Rice	39	19	25	31	40	57
Other Cereals	3	1	2	2	3	5
Pulses	21	13	17	18	22	26
Fruits (Fresh and Dried)	44	10	17	25	36	83
Vegetables	73	45	55	62	72	97
Milk and Dairy	226	85	124	162	215	359
Meat Poultry and Fish	68	19	29	42	54	123
Fish	9	2	4	5	6	17
Edible Oils and Fats	101	63	77	89	102	130
All Food Items	935	462	594	717	868	1,402
Rural Pakistan						
Wheat	134	111	130	140	147	153
Rice	35	21	31	32	42	58
Other Cereals	3	1	2	3	5	5
Pulses	19	13	17	20	24	30
Fruits (Fresh and Dried)	26	9	15	23	35	71
Vegetables	65	45	55	66	78	96
Milk and Dairy	207	94	147	193	270	446
Meat Poultry and Fish	37	17	27	35	45	81
Fish	4	3	4	4	5	7
Edible Oils and Fats	98	66	83	97	120	151
All Food Items	808	488	658	789	986	1,429

Source: HIES (2008).

Note: Food categories total include "Other" food category.

Table 6
*Monthly per Capita Consumption (in Kilograms) of Major Cereal Groups by
 Total Expenditure Quintiles*

Major Cereal Items	Quintile					
	Total	1st	2nd	3rd	4th	5th
Pakistan						
Wheat and Wheat Flour	7.8	7.1	7.7	8.0	8.1	7.9
Rice and Rice Flour	0.9	0.7	0.9	0.8	1.0	1.1
Pakistan Urban						
Wheat and Wheat Flour	6.5	6.3	6.4	6.6	6.6	6.5
Rice and Rice Flour	0.9	0.6	0.7	0.8	0.9	1.1
Pakistan Rural						
Wheat and Wheat Flour	8.4	7.2	8.1	8.6	9.0	9.5
Rice and Rice Flour	0.9	0.7	0.9	0.9	1.0	1.2

Source: HIES (2008).

nongovernmental organisations (NGOs) may have to provide food, clothing, healthcare, and other goods and services. However, restoration of private trade (and even promotion of expansion of trade) can enhance both price stability and food security more effectively and at far less cost, particularly in the post-disaster rehabilitation phase, and also in the relief stage.

Following the 1998 floods in Bangladesh that destroyed about 20 percent of the monsoon season rice crop, the Government of Bangladesh took steps to promote private-sector imports to supplement its own commercial imports and food aid inflows. In particular, the government removed a 2.5 percent tariff on rice imports, expedited clearance of rice imports, and announced strict limits on government sales of subsidised rice. Moreover, past investments in roads and liberalisation of domestic and import trade in rice and wheat had helped make private markets more efficient and able to respond quickly to production shortfalls. Given these past investments and clear, transparent, and consistent policy with adequate price incentives at the time of the flood, private-sector imports exceeded 200,000 metric tons per month for eight consecutive months, in spite of food aid wheat imports of more than 1 million metric tons and large-scale public foodgrain distribution [Dorosh (2001); del Ninno, *et al.* (2001); Dorosh, del Ninno, and Shahabuddin (2004)].

In Pakistan, by contrast, a combination of fluctuating prices in international markets and uncertainty regarding government policy has greatly limited private sector imports of wheat. Incentives for private-sector import (and export) trade in wheat shifted several times between June 2005 and June 2010. However, world prices fell sharply in October 2008, and from October 2008 to June 2010, domestic prices were above export parity prices; private-sector exports were not profitable in this period. Instead of profitable opportunities for *exports*, the combination of the world price decline and an increase in Pakistan's domestic price provided an opportunity for profitable *imports* as domestic prices were approximately equal to import parity from December 2008 to April 2009.

Private sector imports did not occur on a large scale, however, and from July 2009 through June 2010, domestic prices were substantially above import parity. Although, there were substantial incentives for private-sector imports in this period, but private imports of wheat were minimal. Instead, the Trading Corporation of Pakistan imported wheat. Large domestic stocks (procurement exceeded releases by a combined 5.2 million metric tons in fiscal years 2008-09 and 2009-10) and lack of clarity about government interventions likely played a major role in discouraging private imports.

World wheat prices increased 39 percent between June 2010 and August 2010 from \$182.8/metric ton to \$254.0/metric ton, due in large part to fire and smoke damage to Russia's wheat crop and Russia's ban on wheat exports. In spite of a recent increase in international wheat prices due to Russia's wheat export restrictions, Pakistan's wheat prices were still near import parity at the time of the 2010 floods (Figure 3).

Fig. 3. Pakistan Domestic and International Wheat Prices, 2002–10



Thus, it was unclear whether or not the recent floods would have major effects on the wheat market. *Kharif* season rice and maize crops account for only a small share of cereals consumed in Pakistan, and a decline in their availability has relatively little effect on wheat demand or wheat prices. Depending on further developments in world wheat markets, the extent to which flood damage affects Pakistan's 2010-11 harvest, and domestic wheat demand, private-sector wheat imports may provide a zero-fiscal-cost means of stabilising domestic wheat prices at an acceptable import parity level in the coming year.

Institutional Framework and Sources of Financing

In response to the October 2005 earthquake, the Pakistani government established the Earthquake Reconstruction and Rehabilitation Authority (ERRA) with the specific mandate to carry out early recovery, reconstruction, and rehabilitation efforts in the affected areas. A major objective of the recovery and rehabilitation effort was to “build back better,” that is, not to simply restore infrastructure and services to pre-earthquake levels, but to avail of the opportunity to address previous shortcomings and establish improved facilities and services [ERRA (2010)]. The post-earthquake efforts demonstrated the need for a strong institutional framework to coordinate the large-scale disaster response, and they offer the 2010 recovery and rehabilitation efforts a number of pertinent lessons. First, all phases of the disaster response should be handled by the same institution and all stakeholders should be included in the disaster response mechanism [ERRA (2010)]. Second, there is a need to account for long-, medium-, and short-term goals in the postdisaster response and to connect these goals together in one framework [ERRA (2010)]. Third, the participation of two key

stakeholders, the government and the affected communities, must be ensured [ERRA (2010)]. Fourth, post-disaster improvement should not be confined to physical infrastructure and facilities but should include “soft” components as well, such as policy-making, planning, systems and procedures, human resource management, and so on [ERRA (2010)]. Fifth, capacity development has to be an integral and concurrent component of all reconstruction work. Finally, the recovery strategy should be monitored and evaluated and the findings fed back into the recovery process at all stages [ADPC/UNDP (2005)].

Given the Pakistani government’s limited resources and the urgency of the recovery efforts, the sources of financing and the speed at which required funds are delivered to stakeholders both play an important role in the success of the disaster recovery efforts. Previous flood rehabilitation projects demonstrated that financing rehabilitation costs under ongoing projects, rather than through a new, omnibus emergency project, is quicker and likely to be more flexible. This is because high start-up costs are involved in helping the government design a new project and high coordination costs are involved in ensuring that different government agencies and interests involved in such a project are properly aligned. Reprogramming already-existing projects is also more likely to ensure that the response to the floods will be better integrated in the country programme, will influence the design of future projects, and will avoid the tendency of emergency operations to be stand-alone, one-off actions [World Bank (2000)]. However, it is important to include a plan that accounts for future replenishment of project funds, in order to avoid damaging the affected projects’ medium- and long-term goals.

Livelihood Support Programmes and Welfare Transfers

Donors and governments tend to focus on projects that rehabilitate major infrastructure. They put much less effort into understanding the impacts of disasters on livelihoods or investing in programmes to support recovery of livelihoods [ADPC/UNDP (2005)]. A second, livelihoods-focused, needs assessment may be useful at the start of the recovery phase in order to prioritise communities’ and individuals’ needs. Such an assessment could also improve understanding of existing livelihoods in the post-flood environment [Beck (2005)]. Recovery efforts should include support for livelihood security programmes, and in the immediate aftermath of a natural disaster, a provision of compensation based on loss of livelihoods might be necessary to assist affected groups [ADPC/UNDP (2005)].

Well-targeted transfers can be effective in enhancing food security of poor households, particularly when using existing effective targeting mechanisms and distribution channels. Bangladesh successfully avoided a famine through a combination of effective immediate relief efforts and well-targeted public food distribution [del Ninno and Dorosh (2001)]. Following the Bangladesh flood of 1998, distribution of wheat through the targeted Vulnerable Group Feeding programme was greatly expanded. Survey evidence shows that selection of the most vulnerable rural households through village-level committees successfully targeted that programme to the poor [del Ninno and Dorosh (2001)]. As stated above, NGOs with an ongoing development programme are most likely to be effective in the recovery phase, as they are in a better place to effectively target poor households and support their livelihoods [Beck (2005)].

Panel survey analysis of flood-affected households in Bangladesh also indicates that, as a result of the flood, many poor households experienced a substantial increase in debt. Borrowing from private creditors was a major coping strategy for households that lost crops or employment opportunities. This coping strategy was effective in augmenting household

access to food and thereby limiting the decline in food consumption following the flood. However, many households carried debts equal to one month's average expenditure more than one year after the floods had ended. This suggests the need for credit (or even cash transfers) to poor households in the aftermath of a flood or other natural disaster not only to enhance food security in the short run but also to avoid a long-term loss in household welfare [del Ninno, Dorosh, and Smith (2003)].

There are many ways to incorporate livelihood strategies into the recovery and reconstruction efforts [IDS (2010); ADPC/UNDP (2005)]. The following are a summary of lessons learned in this area:

- Social protection should be prioritised in a disaster response so that the most vulnerable groups are protected. Awareness-raising is an important component to ensure participation.
- There must be active participation of key stakeholders from a multisector base as well as the community in the decisions made for each programme. Activities, where possible, should be linked with government, local enterprises, organisations, and industries.
- Intervention should be tailored to target specific needs of different groups.
- Efforts should be made to promote livelihood opportunities for people through provision of temporary work schemes such as debris clearance, construction, public awareness, project management and assessments.
- Partnering with NGOs to provide sustainable livelihood support (provision of seeds and tools, animals, capacity building) should be a component of the recovery efforts as NGOs can play a big part in relief initiatives and microcrediting.
- Developing forums and focus groups for particular industries will enable them to pool resources, share equipment and experiences, and support each other as well as plan for the future. Institutions such as community funding schemes that can help people restart businesses should be considered.
- Loans from the government or private sector and government grants can be used to fill consumption shortfalls.
- Enhancing skills through training to supply more construction-sector artisans (masons, carpenters, electricians, etc.) and training them in hazard-resistant construction technology can upgrade the future workforce.
- Compensation should be paid to people without delay to enable them to rebuild their lives.

Rehabilitation of Agriculture and Infrastructure

Reestablishing community access to necessary livelihood and infrastructure has been one of the first priorities of past recovery efforts. Given the large percentage of Pakistan's population that is dependent on agriculture, the resumption of agricultural activities is vital for the country's recovery and ability to sustain the flood damages. Several lessons drawn from previous experiences can inform postdisaster initiatives and hasten the speed of the restoration of agricultural production and solid infrastructure.

Restoration of Agricultural Activities

- Provision of seeds to smallholders can help these, and even "landless,"⁸ households

⁸Many households who are technically "landless" have small gardens.

regain access to food and income-generating activities in the medium term [Beck (2005)].

- Likewise, replenishing the livestock assets, such as chickens and goats, of the poor can help them generate food and income in the medium term [Beck (2005)].
- Overall, rehabilitation of small-scale agricultural capital is essential. Temporary duty exemptions and other assistance can be critical to inducing renewed investments. For example, in Bangladesh, exempting imports of power tillers from duty in September 1998 promoted a near tripling in imports, from 6,300 (September 2007 to March 2008) to 17,500 (September 2008 to March 2009), as well as a change in technology that facilitated multiple cropping [Benson and Clay (2001); Beck (2005)].⁹
- In addition, it will be advantageous to adapt farming techniques to the local environment by, for example, planting crops that are not at risk from seasonal flooding [ADPC/UNDP (2005)].

Restoration of Infrastructure

Evaluation of previously implemented post-disaster rehabilitation projects suggests the following [IDS (2010); ADPC/UNDP (2005); ADB (1996)]:

- Rapid initial economic assessment of individual subprojects of an emergency loan to determine priorities among subprojects and improve their scope and design is necessary.
- The focus should be not only on restoring infrastructure facilities but also on upgrading them to enhance flood resistance.
- Projects continuous implementation needs to be accounted for by ensuring future upkeep of restored facilities, and transfer of management to local entities.
- The speed at which emergency projects have to be organised should not allow inclusion of unsustainable or economically or socially unjustifiable subprojects.
- Accurate records of landownership and new infrastructure (roads, telecommunications, water supply systems, etc.) need to be maintained so as to provide a baseline for damage assessment in case future disaster strikes.¹⁰
- There should be strict adherence to proper building codes in reconstruction; appropriate land use should be ensured; and in certain areas, disaster-proof construction techniques should be deployed so as to mitigate the impact of future disaster. This particularly applies to health and education facilities.
- Measures should be implemented to minimise loss of communications in the event of a disaster. For example, telecommunications equipment and essential facilities should be housed in prefabricated accommodation or quake-proof buildings; exchanges of

⁹In Pakistan, a small Agricultural Income Tax (AIT), equivalent to less than 0.2 percent of crop sector value added, is imposed on farmers based on area cultivated and type of crops grown. Charges for canal water (abiana) are also small, and do not cover operating and maintenance costs of the canals. Relief from these taxes may be of marginal help, but much more is required to compensate farmers who have lost crops and livestock. See Chaudhry (1999) and Kizilbash (2010).

¹⁰The state of land records management in Pakistan raises concerns regarding the protection of property rights in the aftermath of the floods. In parts of northern Pakistan, land demarcations in rural areas have been washed away and in some places, paper-based land records and Board of Revenue office files may have been lost as well. Moreover, Pakistan's laws relating to land and property are designed to collect revenues, rather than to guarantee title. Though all transactions are to be recorded under the law, none guarantee title, but only provide a presumed ownership [World Bank (2004)]. In this situation, there is the possibility of land-grabbing and corruption, and it is crucial that efforts are made to provide poor households with legal assistance to help them keep their land.

major towns should be linked to a minimum of two media to provide fall-back options; fixed-line networks should be kept to a minimum with more use of Global System for Mobile Communications (GSM) and wireless local loop technologies.

- In rehabilitation efforts, provisions should be made to ensure effective communication between affected areas and those coordinating the disaster response: portable GSM setups should be maintained at the national level for speedy deployment in disaster zones; spare equipment such as switches, satellite phones, and microwave links should be readily available to support emergency rescue and relief efforts; in emergency conditions detailed documentation and everyday standard operating procedures should be relaxed to avoid unnecessary delays in relief operations.
- A cadre of engineers and other technical personnel should be identified and trained in disaster response operations such as road clearance, bridge reconstruction, and the provision of technical assistance to households' reconstruction efforts to ensure safety standards.
- Contingency plans should be made for restoration of infrastructure, communications, and other services in the event of a disaster.
- Finally, an owner-driven approach to housing reconstruction is effective in allowing large-scale implementation.

4. TOWARDS DESIGNING OF A 2010 PAKISTAN FLOOD RESPONSE PROGRAMME

In this section, we discuss some of the key institutions that can play critical roles in the response to the 2010 floods; in addition, we address the implementation challenges that their efforts face.

Pakistan National Disaster Management Authorities

The 2010 Pakistan National Disaster Response Plan (NDRP) sets up national, provincial and district level disaster management authorities in order to serve as the implementing, coordinating and monitoring bodies for disaster management at their respective levels. In addition, the national and subnational authorities are responsible for preparing disaster management plans, at their respective levels, and for their implementation during impending disaster [Pakistan National Disaster Response Authority (2010)]. However, the subnational-level authorities do not yet exercise their functions, and need significant funding and capacity-building support to meet the roles and responsibilities outlined for them in the NDRP. In addition, although efforts are to be coordinated among the national, provincial, and district levels, as we discuss later in this section, coordination among these levels of government can be problematic.

Public Institutions and Programmes

A range of institutions are involved in the flood recovery work. Of these, the two most prominent in terms of the nature of their mandate and the scale of their operations and geographic coverage are the Pakistan Poverty Alleviation Fund (PPAF) and the Benazir Income Support Programme (BISP). PPAF was set up by the Government of Pakistan with donor and government funding to act as an apex wholesaler and manager of funds to the NGO sector in the area of poverty reduction. BISP, the largest government safety net intervention in the country, was initially designed to provide financial support to old and

destitute women. The two together are considered by most decision makers to be the main vehicles for the delivery of flood recovery resources.

*Pakistan Poverty Alleviation Fund*¹¹

Conceptually, the Pakistan Poverty Alleviation Fund is one possible vehicle for the delivery of poverty-alleviating interventions and resources. It adopts a participatory development model using social mobilisation, skill development, and capital accumulation as guiding principles. The model is community based and involves formation of groups or community organisations (COs) at the grass roots. It focuses on social organisation, creates awareness, and builds capacity. Under the PPAF model, communities organise themselves for establishing new groups and consolidating existing ones. The approach is demand-driven with high priority given to community-identified projects. Responsibility for operations and maintenance also falls on these groups. PPAF works through a network of NGOs or partner organisations (POs) that are committed to community-driven development.¹² Potential POs are required to undergo a rigorous selection process with both desk and field appraisals. Disbursements from and performance assessments by PPAF to selected partners take place on a quarterly basis. Compliance with implementation plans and adherence to contractual obligations are mandatory. The POs are generally expected to mobilise and train communities, act as intermediaries for microcredit loans, provide communities with health and education facilities as well as small-scale water and infrastructure projects, and assist communities in the preparation of feasible proposals and aid in their implementation; in addition, POs are responsible for supervising and monitoring PPAF projects.

Sponsored by the Government of Pakistan and funded by the World Bank and other leading donors, PPAF is currently working with 75 POs. It has a grassroots network of more than 130,000 COs and groups in 127 districts covering 30,000 villages, or nearly 70 percent of the villages in the country. PPAF programmes target poor rural and urban communities and place particular emphasis on gender and the empowerment of women. These characteristics position PPAF well for providing relief and rehabilitation in times of disaster. However, there has been no serious evaluation of the PPAF model over the more than 10 years of its existence despite its having grown to become an organisation with a reported resource base of \$1,062.79 million as of April 19, 2010 [PPAF (2010)].

While the absence of an in-depth evaluation of PPAF is a serious handicap, a number of factors lend support to using it as one of the major vehicles for flood relief and rehabilitation work, not the least of which is the absence of any other credible organisation with the reach and capacity to deliver in a timely manner. Those factors include the large network of POs directly working at the grassroots level, with footprints in 127 districts across Pakistan; the model of participatory grassroots development through which COs have formed over the past 10 years of PPAF operations; the capacity and experience of the PPAF POs in appraising community needs as a necessary component of all development interventions; and PPAF's experience in relief activities, especially after the October 2005 earthquake in Azad Jammu and Kashmir and North-West Frontier Province (now Khyber Pakhtunkhwa).

PPAF's experience in the 2005 earthquake, particularly in the relief phase, could prove useful in terms of ensuring the formation of an efficient logistical and operational

¹¹This section is based on PPAF's Annual Report 2009 [PPAF (2010)] and personal interviews with PPAF staff. <http://www.ppaf.org.pk/db/PPAF%20ANNUAL%20REPORT%202009.pdf>

¹²The National Rural Support Programme (NRSP) is one of the larger partner organisations of the PPAF.

edifice to provide planned relief activities to address the 2010 flood situation. PPAF has valuable experience in terms of networking with other governmental agencies and NGOs, including the armed forces, multilateral and bilateral donors, and specialised agencies.

PPAF can leverage these advantages. However, a number of factors need to be considered. First, there are significant gaps in the effective coverage of the PPAF POs at the grass roots. Overall coverage can be claimed in perhaps only a few districts. While the extent of coverage is difficult to assess, the PPAF POs do have a presence in the most affected areas. Second, the capacity and quality of COs through which the POs work also vary by region and type of interventions. Therefore, even where a large number of union councils are covered in a particular district, the quality of coverage varies with the type of PO (rural support programme, NGO, or microfinance institution), their maturity, and the duration of their partnership with PPAF, as well as with their overarching goals, mode of operations, and types of services delivered (whether infrastructure, health and education, microcredit, or any combination of these). It is important to note that PPAF at the implementation level is really the COs that its POs have set up. Third, the floods will likely diminish the capacity of the COs to be effective. Therefore, one must ascertain how many PPAF COs are presently active. Insofar as floods have destroyed infrastructure and displaced populations, the potential capacity of COs in the affected areas might have been badly affected.

Despite the above qualifiers, PPAF's strengths position the institution to contribute in the national flood relief effort. This is manifested by its quick response in terms of resource mobilisation, networking with other partners (chiefly the army and the National Disaster Management Authority [NDMA]), and efficient strategising for provisioning relief goods and medical services.

Benazir Income Support Fund

In a meeting on August 27, 2010, the president of Pakistan directed that the partnership between BISP and NADRA (the National Database and Registration Authority) being used in the ongoing income support programme be used in a similar manner to provide necessary financial support to flood victims in various parts of the country. Under BISP, income support of 1,000 PKR per month is provided to deserving destitute women on the basis of verification of the computerised national identity card (CNIC) by the postal system and the banks. Under the president's flood relief directive to BISP and NADRA, the government intends to award 20,000 PKR (\$232 dollars)¹³ to each flood-affected family as compensation for their losses. The money will also be used to repair damages to their homes. The first installment of 5,000 PKR (\$58) was to be disbursed before *Eid ul Fitr* (the Muslim holiday that marks the end of the fasting month of Ramadan), around September 10, 2010.

In order to meet the presidential directive, these agencies will have to surmount two obstacles. First, the task of registering the population affected by the floods is huge. Currently the task of registering the flood victims rests with the provincial governments. A large number of people are being registered at the flood relief camps established by the army and the government. However, an equally large number of people have not been able to reach the camps or have been denied space in them due to overcrowding. Second, initial reports in the newspapers indicate that a large percentage of persons affected by the floods do not possess CNIC cards. They were either not registered or have lost their cards along with their

¹³ 1 US dollar is equal to 86.2 Pakistan rupees.

belongings in the flood. If the verification procedure through NADRA is similar to the procedure of BISP, the victims who do not possess a CNIC will be excluded. Unfortunately, the families who do not possess the CNIC are the poorest of the poor. As it waits for the listing of the flood victims, BISP is initiating support to the existing flood-affected beneficiaries of BISP by providing them the announced flood relief assistance of up to 20,000 PKR. They propose to expand this operation as the verified database becomes available.

Therefore, for the programme to function, priority needs to be given to the comprehensive listing of all flood victims. This listing exercise should be expanded to elicit basic socioeconomic information that can be used as a baseline to monitor the relief and rehabilitation effort.

Implementation Challenges

The above discussion of the institutions that are likely to be active in flood relief and rehabilitation has indicated some of the specific challenges that arise. In this subsection, we extend and generalise this discussion.

Difficulties of Flood Damage Restoration Projects

The internal rates of return for previous Pakistan flood damage restoration projects involving irrigation and other infrastructure investments, estimated by the Asian Development Bank have generally been low. Several lessons from the 1989-to-1993 Pakistan Flood Damage Restoration Project may help Pakistan avoid low rates of return on such projects in response to the 2010 flood. In particular, a rush to implement the 1989–993 project led to the inclusion of some unsustainable or economically/socially unjustifiable subprojects and to inefficient fund distribution. A clear set of criteria for subprojects in current rehabilitation efforts can help avoid the problem of poor subproject selection. Channeling disaster recovery funds through existing projects can result in faster and more flexible response.

Moreover, beneficiaries were not consulted in any stage of the 1989–1993 project. There were no special efforts to promote employment of local people during implementation or arrangements for organising them for maintaining the restored facilities. Greater involvement of local people in design of subprojects and in their implementation and maintenance needs to be given priority. A long-term perspective to investment planning is also needed so as to build infrastructure and drainage systems that can minimise damage from future floods.

Lack of Coordination between the Federal and Provincial Authorities

There has traditionally been a lack of coordination among institutions at the federal and provincial government levels in Pakistan. This has been evident historically in the sharing of federal revenues as well as the successive and long drawn out deliberations around the provincial finance awards, the issues around the sharing of the waters from the Indus River basin, and the lack of agreement on constructing the Kalabagh and other dams. Moreover, based on the experience following the earthquake of 2005 and evaluation of the earthquake response preparedness [Buttenheim (2009)], the provincial authorities have no or very little preparation to respond to the situation and are dependent on assistance from the armed forces and the federal government agencies. The National Disaster Risk Mitigation Plan indicates establishment of Provincial Disaster Management Authorities, but this plan

has yet to materialise. Apart from the province of Punjab, which has set up some mechanisms of disaster mitigation (in the form of the emergency telephone number, rescue 1122), the other provinces were unprepared to respond to the destruction brought by the floods. There is little proactive planning and timely access to early warning. In addition, there is an increasing lack of confidence and trust between the provinces. The provinces have already started showing their discontent over the distribution of funds as there is increasing demand from provinces, reported in the national newspapers, that the funds should be directly given to the provinces instead of being routed through the federal government.

Rapid Damage Assessment

Experience suggests that a realistic assessment of the damage is needed after the floodwaters recede. Relief efforts will need to address the myriad issues of displacement, the lack of food and healthcare, and the economic crisis that the entire country will be facing. These losses will escalate if not addressed quickly. In that light, it is imperative that damage assessments be conducted quickly and in a manner that builds ownership among the key stakeholders so that findings can be addressed effectively.

Channelling Funds

There is growing concern among the national and international community involved with the flood relief efforts about channeling funds for relief and rehabilitation in the most effective way. The United Nations and other key donors work directly as well as through the government (NDMA) and national and international NGOs. The World Bank and Asian Development Bank traditionally channel their resources through government ministries and line departments. While it is too early to assess in this case, the experience of the October 2005 earthquake suggests that there is a need for a central pool of resources, administered by the government with representation from donors, semi-autonomous bodies (e.g., PPAF, rural support programmes, and so on), and the civil society, who should work in coordination to formulate and implement strategies for use of the funds and monitoring of progress. All funds should be subject to third-party audits to ensure transparency of the process.

Political Inconsistency

Backsliding on commitments or being inconsistent between policy and action can be a serious constraint on the effectiveness of any relief and rehabilitation measure. This historical issue of inconsistency between policy and implementation can pose serious challenges during the current crisis. The present government's low level of ownership for the NDMA set up by the previous government is a case in point. The prime minister has expressed dissatisfaction in his public statements over the performance of NDMA and has recently announced establishing a parallel body called the National Disaster Management Committee with the same role and responsibilities as NDMA. This act is likely to have many implications in terms of duplication of activities, lower ownership on the part of both bodies, and confusion among the donors. Any such actions at this point can compromise the effectiveness of relief and rehabilitation efforts.

Capacity and Delivery Issues

Despite the several weeks' warning downstream areas had after the floods struck the northern areas of Khyber Pakhtunkhwa, the provinces were ill equipped to protect the

population with the basic necessities like shelter and food. Several weeks after the floods, the lack of transportation facilities, sufficient supplies like tents, and knowledge and information about disaster mitigation continued to be major constraints.

Disaster response employs multiple disciplines, such as developing competent in-country education programmes aligned with internationally accepted standards [NDMA (2010)]. Operational contingency planning must, therefore, be refined in disaster-vulnerable districts. Disaster response agencies have their strengths and weaknesses. In disaster-prone countries like Pakistan, it is imperative to develop basic disaster risk mitigation knowledge and skills not only among the policy-makers and implementation groups but also among members of the at-risk communities.

Enhancement such knowledge and skills among the current generation's students is also pertinent in enabling future generations to deal with disaster risk problems [NDMA (2010)]. Training and education should involve orientation about disaster risks and vulnerabilities, skill development on risk assessment, vulnerability reduction, hazard mitigation, and emergency response management [NDMA (2010)]. Specialised training in areas of response, such as search and rescue, first aid, fire fighting, evacuation, camp management, and relief distribution will also be necessary [NDMA (2010)]. Considering the importance of media, NDMA and the provincial disaster management authorities need to establish partnerships with electronic and print media and develop awareness of media personnel.

Lack of Early Warning Systems

Pakistan needs to establish and strengthen early warning system mechanisms to ensure appropriate responses to recurring natural disasters like the recent flood. This will include bringing together the latest technologies that provide early warnings (these already exist within Pakistan's national space research agency, the Space and Upper Atmosphere Research Commission) and acquiring adequate scientific training to monitor such situations and disseminate timely information so that hazards can be met with preparation. Such systems have the potential to contribute significantly to reduce disaster losses.

Mainstreaming Concerns for Women and Children

Initial reports in the national newspapers indicate that women and children were the worst affected demographic during the recent floods in Pakistan. Traditionally, the needs of this most vulnerable section of society are overlooked in countries like Pakistan. Ignoring gender aspects in disaster response, recovery, and preparedness is likely to result in worsening existing poverty and inequality levels. It is imperative that the assessments and the programs developed for rehabilitation of flood victims are gender sensitive and aim at de-intensifying the existing political, social, and economic inequalities faced by women [NDMA (2010)]. In spite of the devastation that they cause, natural disasters provide opportunities for social and economic change. Women can be empowered as equal stakeholders to act as key resources before, during, and after disasters to reduce deaths, restore the household economy, and reduce the breakdown of social safety nets.

5. CONCLUSION

The experience of recovery from previous natural disasters in Pakistan and throughout South Asia offers numerous insights and lessons that may be applicable to the

post-2010 Pakistan flood rehabilitation and recovery efforts. We have grouped these lessons into four broad categories: market and trade policies; institutional framework and sources of financing; livelihood support programmes and welfare transfers; and rehabilitation of agriculture and infrastructure.

Under clear, transparent, and consistent policy with adequate price incentives, private trade and imports can substantially contribute to the country's postdisaster recovery. Restoration of private trade (and even promotion of expansion of trade) can enhance both price stability and food security. It can do so more effectively and at far less cost than government-led or international organisation-led efforts, particularly in the post-disaster rehabilitation phase.

There is a need for a strong institutional framework to coordinate the large-scale disaster response. Long-term and short-term goals need to be accounted for and integrated into this comprehensive post-disaster response framework. Involvement of all affected stakeholders in the policy formulation is important to ensure representation and participation. The experience in Bangladesh suggests that financing of recovery efforts through existing projects and delivery mechanisms enables a faster and more flexible response.

Recovery efforts should include support for livelihood security programmes. In the immediate aftermath of the floods, a provision of compensation based on loss of livelihoods might be necessary to assist affected groups. Stakeholders and vulnerable groups should be included in the recovery efforts in a variety of ways ranging from participation in the rehabilitation plan formulation to inclusion in temporary work schemes related to the relief and reconstruction efforts. Alternative strategies for the poor to cope with loss of income need to be examined in order to avoid high and unsustainable indebtedness of households, resulting from the flooding.

There are opportunities for not only restoring infrastructure facilities but also upgrading them to enhance flood resistance. In addition, the rapid resumption of normal agricultural activities is vital for the country's recovery. Therefore, provision of inputs to affected smallholders is essential.

Finally, it is important to establish and strengthen disaster response capability so that the country can better respond to recurring natural disasters. Emergency early warning system mechanisms have the potential to substantially reduce casualties and economic losses from disasters, and they need to be strengthened. Likewise, the lessons learned from the relief and rehabilitation response to the 2010 floods should be incorporated in contingency plans for future natural disasters.

APPENDIX A
FLOOD HISTORY IN PAKISTAN, 1985 TO 2010

Table A.1

Major Floods in Pakistan 1985 to 2010 (Floods with 50,000 or more Displaced Persons)

	Start Date	Duration in Days	No. of Deaths	Number of Displaced Persons	Damage (Millions of \$USD)	Area Affected in Thousands Square Kilometers
All Four Provinces	7-27-10	41*	1,677	18,699		160.0
Punjab Province	8-9-08	12	37	90.75		165.9
Peshawar and Khyber Pakhtunkhwa	8-2-08	100	35	200		32.5
Balochistan Province: Turbat, Sibi, Kech, Jal Magsi, Gawador, and Ormara. Pasni, Bela, Mara, Bolan, Dasht, Naal, Khuzdar, Awaran, Kharan, Khurdar, Noshki, Jaffarabad, Naseerabad, and Dera Allah Yar. Lasbella. Nal. Sindh Province: Jacobabad and Qambar. Thatta and Badin districts—Keti Bandar, Shah Bandar, Jati, Larkhana. Shahdad Kot District. Talhar. Kamber - Shahdadkot. Dadu area. Qubo Saeed Khan, Dhori Minor, Ghabi Dero, Warah, Nasirabad.	6-26-07	25	280	400		115.8
Punjab Province: Districts: Layyah, Dera Ghazi Khan, Rajanpur, Muzaffargarh, Rahim Yar Khan, Multan, Bhakkar. Towns: Sahiwal, Chiniot, Leiah, and Kot Mithan Sharif. Marala, Gujrat, Wazirabad, Gujranwala, Mandi Bahauddin, Sargodha, Muzaaffarabad. Other districts: Sialkot, Jhang, Hafiz Abad, Chiniot, Narowal. Bajwat. Sindh Province: Districts: Sukkur, Ghotki, Kashmore, Shikarpur, Dadu, and Jamshoro. Guddu. Khyber Pakhtunkhwa: Districts: Charsadda, Nowshera, Peshawar, Swat, Chitral, Karak, and Shangla, Tapu Korona, Sheikhabad, and Jala Bela, Dera Ismail Khan, Monda.	7-5-05	41	40	452		433.5
	6-21-05	46	5	50		28.6

	Start Date	Duration in Days	No. of Deaths	Number of Thousands of Displaced Persons	Damage (Millions of \$USD)	Area Affected in Thousands Square Kilometers
Sindh Province—Thatta and Badin districts; Coastal towns of Hyderabad, Tharparker, Umer Kot, Mirpur.	5-20-99	3	168	200	10.9	59.6
Makran Coastal District	3-2-98	4	300	240		165.6
Provinces: Punjab, North-West Frontier—Shinkari, Gilgit, Lahore, Rawalpindi, Jhelum, Chenab, Sutlej.	8-12-97	23	165	836		276.9
Punjab Province	9-2-96	6	119	100		203.0
Provinces: Punjab, Sindh, Balochistan, North-West Frontier.	7-19-95	23	600	600		672.3
Northern and Central Pakistan—Azad Kashmir, Punjab.	9-8-92	11	2,750	3,000	2,400	873.4
Sindh Province	7-15-92	27	94	1,280	4	137.6
Sindh Province—several dozen villages destroyed.	8-18-88	8		200	117.9	33.0
Punjab Province—13 districts. North-West Frontier Province—Tochi River in North Waziristan . Chugarzai village in Swat District. Indus River. Kohistan. Kashmir Province—Jhelum and Chenab rivers. Sindh.	7-18-88	19	158	163,000		220.5

Source: Dartmouth Flood Observatory (2010). * The current-year information was updated from IDS (2010).

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