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**Rehabilitating Agriculture and Promoting Food Security
following the 2010 Pakistan Floods**

Insights from South Asian Experience

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ABSTRACT

The recent floods in Pakistan have had a devastating effect on the Pakistani population. The Office for the Coordination of Humanitarian Affairs (OCHA 2010) estimates that, as of early September 2010, more than 20 million people had been displaced by the flood and by some estimates the damage to crops, housing, other buildings, roads, and irrigation infrastructure now reaches \$6.5 billion (OCHA 2010).^{*} Recovery experiences from previous natural disasters in Pakistan and throughout South Asia, especially the 2005 earthquake in Pakistan and the 1998 flood in Bangladesh, suggest lessons in four broad areas that are relevant for recovery efforts following the 2010 Pakistan flood.

First, market and trade policies should be clear, transparent, and consistent, maintaining adequate price incentives so that private trade and imports can contribute to postdisaster recovery. 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 than otherwise, particularly in the rehabilitation phase.

Second, 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 a comprehensive postdisaster response framework. Involvement of all affected stakeholders in the policy formulation is important to ensure representation and participation.

Third, recovery efforts should also include support for livelihood security and restoration and ensure inclusion of the stakeholders. In the immediate aftermath of the floods, a provision of compensation based on loss of livelihoods might be necessary to assist affected groups. Alternative strategies for the poor to cope with the loss of income need to be examined (including credit provision) so as to avoid high and unsustainable household indebtedness.

Fourth, evaluation of previously implemented projects suggests that focus on not only restoring infrastructure facilities but also upgrading them can lead to enhanced flood resistance as well as a reduction in future disaster loss. In addition, the resumption of normal agricultural activities as soon as possible is vital for the country's recovery. The provision of inputs to affected smallholders is necessary for the resumption of normal livelihood activities.

The 2010 Pakistan National Disaster Response Plan incorporates some of these lessons learned from earlier disasters. However, despite the establishment of national and sub-national disaster management authorities, significant challenges to the functioning of this system still remain.

Two alternative institutions present themselves as possible vehicles for the delivery of poverty-alleviating interventions and resources—the Pakistan Poverty Alleviation Fund (PPAF) and the Benazir Income Support Programme (BISP). PPAF uses a participatory and community-based model and comprises a network of more than 130,000 community organizations and groups in 127 districts covering 30,000 villages. This large and established network puts PPAF in a convenient position to reach affected communities in a timely and efficient manner.

BISP has a partnership with the National Database and Registration Authority (NADRA) that is being used to provide necessary financial support to flood victims throughout the country. However, there are several obstacles to the successful disbursement of funds through BISP. In particular, because a large percentage of displaced people do not possess computerized national identity cards, these people could be excluded from the income support programs unless a new comprehensive listing is done.

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.

Keywords: Pakistan, floods, postdisaster recovery and rehabilitation, lessons learned

^{*} All dollars are U.S. dollars.

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* This note is available at: http://siteresources.worldbank.org/EXTDIRGEN/Resources/ieg_pakistan_note.pdf.

1. INTRODUCTION

The recent 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, have been unusually devastating in terms of the loss of life and other damage they have caused. 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 floodwaters are slow to recede, the spread of water-borne disease, and ensuring food security for the poor.

There is an increasing consensus that flood recovery and rehabilitation efforts have to take a multisector 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.

In this paper, we group these lessons into four broad categories: market and trade policies; institutional framework and sources of financing; livelihood support programs and welfare transfers; and rehabilitation of agriculture and infrastructure. We summarize the major insights that may be relevant to Pakistan's postflood rehabilitation efforts. We also look at the existing national and subnational authorities involved in disaster management as well as other possible mechanisms by which disaster rehabilitation funds and efforts can be channeled. 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).

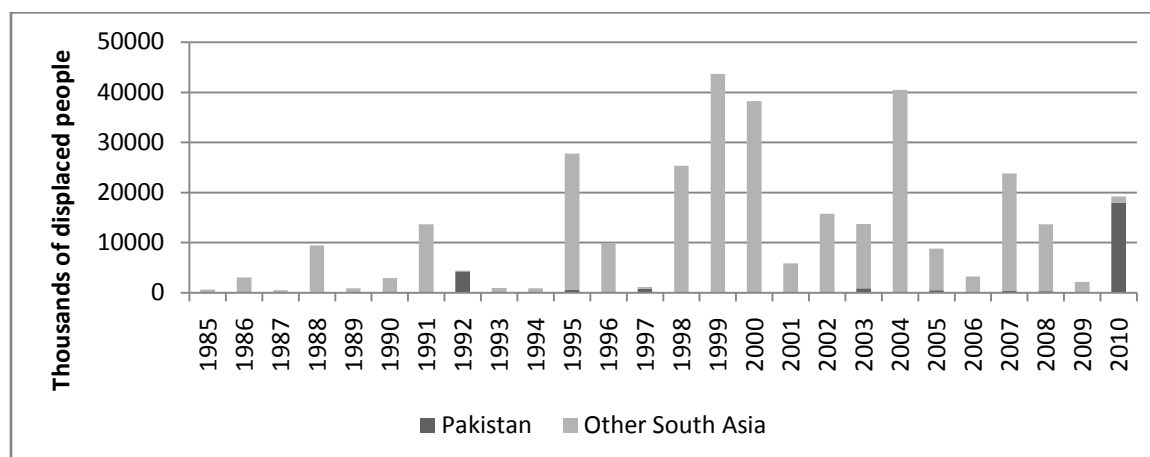
Table 1. Pakistan 2010 flood comparison with other recent natural disasters

	Flood	Earthquake	Katrina Cyclone	Nargis Cyclone	Tsunami
	Pakistan	Pakistan	USA	Myanmar	Indian Ocean
	(Aug. 2010)	(Oct. 2005)	(Aug. 2005)	(May 2008)	(Dec. 2004)
Population affected	18,699,158*	3,500,000	500,000	2,420,000	2,273,723
Area affected (sq. km.)	132,000*	30,000		23,500	
Deaths	1,677*	73,338	1,836	84,537	230,000
Injured	2,605*	128,309		19,359	125,000
Households damaged	1,248,714*	600,152		450,000	
Estimated economic damage (million US\$)	6,500**	5,200	125,000	4,000	7,791

Sources: * Relief Web (2010): information as of September 4, 2010; ** OCHA (2010); and Associated Press of Pakistan (2010).

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).

Figure 1. South Asia major floods: Population displaced



Source: Dartmouth Flood Observatory (2010).

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

Table 2. Impact of the 2010 floods

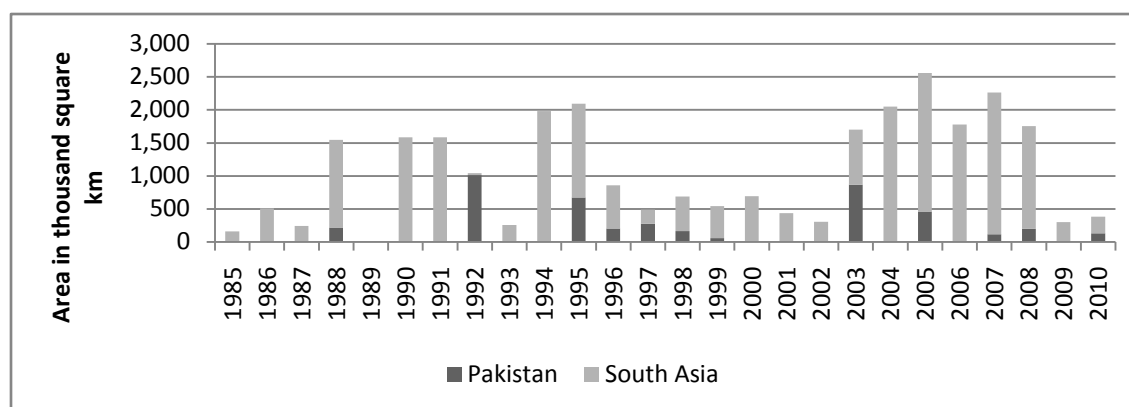
	Khyber Pakhtunkhwa Rural	Punjab Rural	Sindh Rural	Balochistan Rural	All Pakistan Urban	All Pakistan Total
Agroecology	<i>Barani</i>	<i>Barani</i> (mainly in north) and canal irrigated	Canal irrigated	<i>Barani</i>		
Major crops	Wheat, maize	Wheat, rice, cotton	Wheat, rice, cotton	Wheat, rice		
Impact of floods						
Deaths	1,121	103	151	48	—	1,677
Injured	1,165	350	845	98	—	2,605
Houses damaged	192,605	500,000	470,910	75,261	—	1,248,71
Population affected *	4,365,909	8,200,000	4,746,482	1,060,162	—	18,372,5
Crop area affected (hectares)	443,116	1,516,661	998,561	627,992	—	3,586,33 0
Flood damage by type (million US\$)						
Crops	156	1,204	557	—	—	2,185
Livestock	65	—	233	144	—	441
Residential property	1,151	828	—	—	—	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).

Notes: Data is as of September 4, 2010. Crop area is defined as land of which at least 60 percent is cultivated. *Barani*: nonirrigated.

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

Figure 2. South Asia major floods: Area affected



Source: Dartmouth Flood Observatory (2010).

² One 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.

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 nonirrigated (*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, sugar cane, 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 that were still standing in the fields in August and early September. The Office for the Coordination of Humanitarian Affairs (OCHA; 2010) estimates losses of \$2.2 billion, mainly in rural Punjab (\$1.2 billion). 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).

Alternative estimates of flood damage can be constructed using household survey data from the 2007–08 Pakistan Household Income and Expenditure Survey (HIES; Table 3).⁵ Assuming a 20 percent loss in crop output, and using the mean crop land productivity by province from the HIES, the value of 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.

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

⁴ Note 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).

⁵ The 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.

Table 3. Alternative estimates of the value of agricultural crop losses from the 2010 Pakistan floods

Province	Affected Area (million acres)	Mean Land Productivity (PKR/acre)	Median Land Productivity (PKR/acre)	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	3.50	27,602	24,327	63.98	56.39	159.95	140.96
Sindh	1.57	28,520	27,458	29.58	28.48	73.95	71.20
Khyber Pakhtunkhwa	0.47	26,759	21,133	8.27	6.53	20.67	16.33
Balochistan	0.63	34,289	19,000	14.32	7.94	35.80	19.84
Azad Jammu and Kashmir	0.08	26,759	21,133	1.35	1.07	3.37	2.66
Gilgit-Baltistan	0.01	26,759	21,133	0.16	0.13	0.40	0.31
All	6.25	28,433	24,292	117.66	100.52	294.15	251.31

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.

Reduction in agricultural incomes will likely lead to lower spending on rural nonfarm goods and services (processing, marketing, rural services, and so on), and thus reduce rural nonfarm incomes as well. These multiplier effects can be quite large, equivalent to an extra 1.5 PKR of lost nonfarm income for a 1 PKR loss in crop incomes.⁸ 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 out of a total food expenditure of 850PKR/person/month; Table 4). In quantity terms, wheat and wheat flour consumption is about eight times larger than rice consumption nationally (7.8 kilograms/person/day for wheat and wheat flour, compared with 0.9 kilograms/person/day for rice; Table 5). 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/day) is about 10 times greater than rice consumption (0.7 kilograms/person/day). As discussed below, changes in trade policy could help stabilize 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).

Table 4. 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 & 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

⁸ Dorosh, Niazi, and Nazli (2003).

Table 4. Continued

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 5. 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).

3. SOUTH ASIA'S EXPERIENCE RESPONDING TO NATURAL DISASTERS

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 characterized 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 programs 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.⁹

Market and Trade Policies

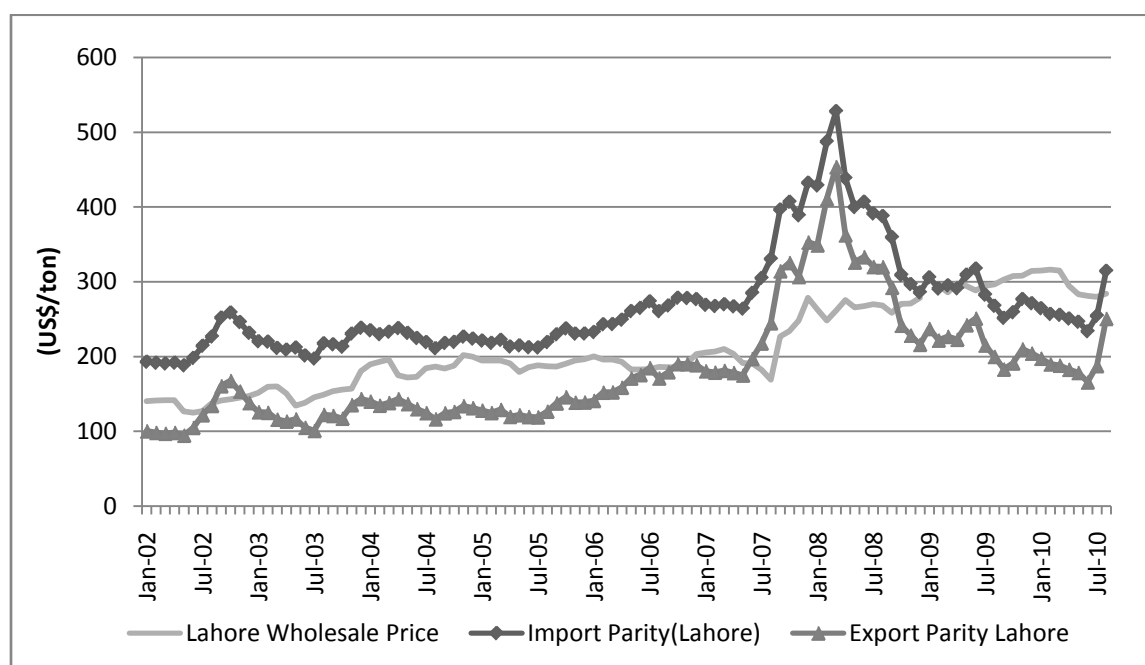
Immediately following a major natural disaster, one often sees major disruptions to roads, port facilities, transport services, physical market structures, and both internal and external trade flows. In the relief operations immediately after the disaster strikes, government agencies, international agencies, and nongovernmental organizations (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 postdisaster 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 subsidized rice. Given this clear, transparent, and consistent policy with adequate price incentives, 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 spite of a recent increase in international wheat prices due to Russia's wheat export restrictions, Pakistan's wheat prices are near import parity (Figure 3). Thus, a policy of promoting private-sector imports has the potential to stabilize market prices at import parity levels without any fiscal burden on the government (Box 1).

⁹ 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.

Figure 3. Pakistan domestic and international wheat prices, 2002–10



Box 1. Pakistan’s wheat policy

Incentives for Pakistan’s private-sector import (and export) trade in wheat shifted several times between June 2005 and June 2010. From January 2003 to May 2006, wholesale prices in Lahore were well within the import and export parity bounds; there was no incentive for imports or exports of ordinary wheat (as opposed to specialty wheat for baking purposes).

From May 2006 to December 2006, however, after a moderate world price increase, export parity prices rose to domestic price levels; during this time private-sector exports were theoretically profitable. Then, from July 2007 to September 2008, world prices surged far above domestic prices. After allowing exports in mid-2007, the Pakistan government then banned exports to prevent domestic prices from rising further. Pakistan’s domestic prices thus were kept far below export parity.

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, the combination of the world price decline and an increase in Pakistan’s domestic price made domestic prices equal to import parity from December 2008 to April 2009.

From July 2009 through June 2010, domestic prices were substantially above import parity. There were substantial incentives for private-sector imports in this period and private imports apparently were permitted, though 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. This has at least temporarily brought import parity prices up to levels approximating Pakistan’s pre-flood domestic prices.

Whether or not the recent floods will have major effects on the wheat market is unclear. *Kharif* season rice and maize crops account for only a small share of cereals consumed in Pakistan, and a decline in their availability will likely lead to relatively little increase in wheat demand or wheat prices.

Nonetheless, households that have lost livelihoods face serious problems related to lack of access to food, safe drinking water, and proper sanitation facilities. Also, in the short run, the breakdown of delivery mechanisms may create food supply shortages in flood-affected areas, adversely affecting food security.

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 stabilizing domestic wheat prices at an acceptable import parity level in the coming year.

* US (FOB Gulf) USD/MT No. 2, hard red winter, ordinary protein, f.o.b. vessel.

Source: Authors.

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 preearthquake levels, but to avail of the opportunity to address previous shortcomings and establish improved facilities and services (ERRA 2010). The postearthquake 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, postdisaster improvement should not be confined to physical infrastructure and facilities but should include “soft” components as well, such as policymaking, 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 (Box 2) 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 program, 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 Programs 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 programs 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 prioritize communities’ and individuals’ needs. Such an assessment could also improve understanding of existing livelihoods in the postflood environment (Beck 2005). Recovery efforts should include support for livelihood security programs, 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).

Box 2. Bangladesh flood rehabilitation projects implemented by the Asian Development Bank:
Lessons learned

Key projects:

Flood Damage Rehabilitation Project (Loan no. 1666)

Approved: December 22, 1998 Closed: December 13, 2007 Cost: \$118.21 million
Main objective: assist with the rehabilitation of key infrastructure damaged by the 1998 floods.

Emergency Flood Damage Rehabilitation Project (Loan no. 2156)

Approved: January 20, 2005 Closed: December 13, 2007 Cost: \$204.38 million
Main objective: assist with the rehabilitation of key infrastructure damaged by the 2004 floods.

Emergency Disaster Damage Rehabilitation (Sector) Project (Project no. 41657)

Approved: January 31, 2008 Closed: June 30, 2010 Cost: \$220 million
Main objective: continue the rehabilitation of key infrastructure damaged by the 2004 floods.

Components:

The projects included the following objectives: rehabilitating rural roads, bridges, and culverts as well as flood and cyclone shelters, national and regional roads, and railway infrastructure; rehabilitating flood control, drainage, and irrigation facilities; repairing embankment breaches and repairing or replacing water control structures, protective works, and canals; and restoring municipal infrastructure including footpaths and drains in the municipal slums. The project also included capacity building and training in flood-resistance infrastructure design standards to strengthen the government's disaster preparedness, as well as analytical input and capacity building to enhance early warning systems.

Lessons learned (effective postdisaster project requirements):

- (i) Quick preparation of disaster assistance and assessment of the crisis.
- (ii) Focus on restoring infrastructure facilities but also upgrading them to enhance flood resistance; accounting for future damage in initial damage assessment.
- (iii) Completion of rehabilitation work within a short time frame.
- (iv) Strong consulting support and Asian Development Bank supervision during subproject design and implementation; assistance with regular training to the staff implementing subprojects.
- (v) Matching and rapid response to disaster from the government.
- (vi) Beneficiary participation in the project preparation and implementation; special provisions to hire local labor and include particularly vulnerable groups in the labor force during the construction work; sourcing required materials from local sources if possible.
- (vii) Environmental and social aspects need to be incorporated in project design and monitored during implementation.
- (viii) Retroactive financing and imprest accounts should be used to facilitate government access to funds as well as the rapid and efficient release of government funds; avoid backlog on disbursements.
- (ix) Establish subproject selection criteria and requirements that are clearly defined and permit simple prioritization of subprojects and rapid implementation as well as proper monitoring and control.
- (x) Establish a Project Steering Committee (a central coordination and monitoring unit) to facilitate coordination between donors and the government.
- (xi) All facilities to be rehabilitated should have a maintenance and operation action plan to ensure upkeep after rehabilitation.
- (xii) A resettlement plan should be drafted and prepared.
- (xiii) Gender impact should be considered in the project design.

Source: ADB (2008a, 2008b, 2009).

Well-targeted transfers can be effective in enhancing food security of poor households, particularly when using existing effective targeting mechanisms and distribution channels. Following the Bangladesh flood of 1998, distribution of wheat through the targeted Vulnerable Group Feeding program was greatly expanded (Box 3). Survey evidence shows that selection of the most vulnerable rural households through village-level committees successfully targeted that program to the poor (del Ninno and Dorosh 2001). As stated above, NGOs with an ongoing development program 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).

Box 3. The Bangladesh flood of 1998

In 1998, Bangladesh suffered what was dubbed the “flood of the century” 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.

Bangladesh successfully avoided a famine through a combination of effective immediate relief efforts, promotion of private-sector rice imports, and well-targeted public food distribution (in part supplied by food aid). Medium-term policies and investments also played a major role in the ability of the economy to sustain damages and recover quickly. Government agricultural and investment policies enabled a long-term expansion in the winter season (*boro*) rice crop that added to production and lessened dependence on the flood-susceptible *aman* rice crop. Investments in roads and liberalization of domestic and import trade in rice and wheat helped make private markets more efficient and able to respond quickly to production shortfalls.

Nonetheless, to cope with the loss of incomes from the floods, most poor and flood-exposed households borrowed heavily from private-sector sources. Moreover, even 15 months after the flood, household debts still averaged about one and one-half months’ average consumption for the 64.2 percent of flood-exposed households in the bottom 40 percent of the expenditure distribution who were in debt. To eliminate borrowing following the flood would have required a transfer of approximately \$100 for each household. At the national level, total private borrowing by households may have reached \$1.0 to \$1.5 billion, equivalent to nearly one-fourth of total government expenditures in fiscal 1998/99 and about double the combined annual loan disbursements of Grameen Bank and BRAC at that time.

Sources: Dorosh (2001), del Ninno et al. (2001), and del Ninno, Dorosh, and Smith (2003).

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 prioritized 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 program. Activities, where possible, should be linked with government, local enterprises, organizations, 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, assessments, and so on.

- 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. 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,”¹⁰ households 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).¹¹
- 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).

¹⁰ Many households who are technically “landless” have small gardens.

¹¹ In Pakistan, a small Agricultural Income Tax (AIT), equivalent to less than 0.2% 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).

Restoration of Infrastructure

Evaluation of previously implemented postdisaster rehabilitation projects suggests the following (IDS 2010; ADPC/UNDP 2005):

- The focus should be not only on restoring infrastructure facilities but also on upgrading them to enhance flood resistance.
- 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.¹²
- 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 minimize loss of communications in the event of a disaster. For example, telecommunications equipment and essential facilities should be housed in prefab accommodation or quake-proof buildings; exchanges of 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.

¹² The 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.

4. TOWARD THE DESIGN OF A 2010 PAKISTAN FLOOD RESPONSE PROGRAM

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) outlines the responsibilities of existing disaster management authorities in responding to disasters at national, provincial, state, local, and district levels. Box 4 summarizes the responsibilities of the individual agencies as outlined in the NDRP. As we discuss later in this section, although efforts are to be coordinated among the national, provincial, and district levels, coordination among these levels of government can be problematic.

Public Institutions and Programs

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 decisionmakers to be the main vehicles for the delivery of flood recovery resources.

*Pakistan Poverty Alleviation Fund*¹³

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 mobilization, skill development, and capital accumulation as guiding principles. The model is community based and involves formation of groups or community organizations (COs) at the grass roots. It focuses on social organization, creates awareness, and builds capacity. Under the PPAF model, communities organize 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 organizations (POs) that are committed to community-driven development. 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 mobilize 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.

¹³ This 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>

Box 4. Pakistan Disaster Management Authorities

Pakistan National Disaster Response Plan—March 10, 2010—Response Agencies

The National Disaster Response Plan (NDRP) sets up the following national- and subnational-level authorities. However, the subnational-level authorities do not yet exercise their functions, and thus need significant funding and capacity-building support to meet the roles and responsibilities outlined for them in the NDRP. The roles and responsibilities are as follows:

a. National Disaster Management Authority/Commission

- i. Act as the implementing, coordinating, and monitoring body for disaster management at the national level.
- ii. Prepare the National Plan to be approved by the National Commission.
- iii. Implement, coordinate, and monitor the implementation of the National Policy.
- iv. Establish guidelines for preparing disaster management plans by different ministries or departments and the provincial authorities.
- v. Provide necessary technical assistance to the provincial governments and the provincial authorities for preparing their disaster management plans in accordance with the guidelines established by the National Plan.
- vi. Coordinate response in the event of any threatening disaster situation or disaster.
- vii. Lay down guidelines for, or give directions to, the concerned ministries or provincial governments and the provincial authorities regarding measures to be taken by them in response to any threatening situation or disaster.

b. Provincial and State Disaster Management Authority

- i. Formulate the provincial disaster management policy obtaining the approval of the Provincial Commission.
- ii. Coordinate and monitor the implementation of the National Policy, National Plan, and Provincial Plan.
- iii. Examine the vulnerability of different parts of the province to different disasters and specify prevention or mitigation measures.
- iv. Establish guidelines to be followed for preparation of disaster management plans by the provincial departments and district authorities.
- v. Evaluate preparedness at all governmental or nongovernmental levels to respond to disaster and to enhance preparedness.
- vi. Coordinate response in the event of disaster.
- vii. Give directions to any provincial department or authority regarding actions to be taken in response to disaster.
- viii. Promote general education, awareness and community training in this regard.
- ix. Provide necessary technical assistance or give advice to district authorities and local authorities for conveying out their functions effectively.
- x. Advise the provincial government regarding all financial matters in relation to disaster management.
- xi. Examine the construction in the area and ensure compliance to standards.
- xii. Ensure that communication systems are in order and disaster management drills are being carried out regularly.

c. District/Agency Disaster Management Authorities

- i. Prepare a disaster management plan including a district response plan.
- ii. Coordinate and monitor the implementation of the National Policy, Provincial Policy, National Plan, Provincial Plan, and District Plan.
- iii. Ensure that the areas in the district vulnerable to disaster are identified and measures for the prevention of disaster and the mitigation of its effects are undertaken by the departments of the government at the district level as well as by the local authorities.
- iv. Ensure that the guidelines for prevention, mitigation, preparedness, and response measures as established by the national authority and the provincial authority are followed by all departments of the government at the district level and the local authorities in the district.
- v. Give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disaster as may be necessary.
- vi. Establish guidelines for preparation of disaster management plans by the departments of the government at the district level and local authorities in the district.
- vii. Monitor the implementation of disaster management plans prepared by the departments of the government at the district level.
- viii. Establish guidelines to be followed by the departments of the government at the district level: organize and coordinate specialized training programs for different levels of officers, employees, and voluntary rescue workers in the district. Facilitate community training and awareness programs for prevention of disaster or mitigation with the support of local authorities and governmental and nongovernmental organizations.
- ix. Set up, maintain, review, and upgrade the mechanism for early warnings and dissemination of proper information to the public.
- x. Prepare, review, and update district-level response plan and guidelines.
- xi. Coordinate with, and give guidelines to, local authorities in the district to ensure that predisaster and postdisaster management activities in the district are carried out promptly and effectively.

Source: Pakistan National Disaster Response Authority (2010).

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 programs 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 organization 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 organization 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 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 specialized 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 program, 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 mobilization, networking with other partners (chiefly the army and the National Disaster Management Authority [NDMA]), and efficient strategizing 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 program be used in a similar manner to provide necessary financial support to flood victims in different 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 computerized 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)¹⁴ to each flood-affected family as compensation

¹⁴ 1 US dollar is equal to 86.2 Pakistan rupees.

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 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 program 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 generalize 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 and presented in Annex Table B1, have generally been low. Several lessons from the 1989-to-1993 Pakistan Flood Damage Restoration Project (Annex Box B1) may help Pakistan avoid low rates of return on such projects in response to the 2010 flood. In particular, a rush to implement the 1989–1993 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 organizing 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 minimize damage from future floods.

Lack of Coordination between 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 materialize. 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.

Channeling 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, semiautonomous bodies (e.g., PPAF, rural support programs, 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 to 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, the 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 continue to be major constraints. Disaster response employs multiple disciplines, such as developing competent in-country education programs 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 policymakers 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). Specialized 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

Severe floods affect not only a country's infrastructure but also the education, health, water and sanitation, transportation, communications, agricultural, trade, and industrial sectors. There is a growing consensus that flood policy formulation must include multidisciplinary, multisector, and multistakeholder participation, initiatives, and activities to address the flood environment (ADPC/UNDP 2010).

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 programs 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 organization-led efforts, particularly in the postdisaster 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 postdisaster 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 programs. 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 Thousands 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 North-West Frontier Province	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, Muzaffarabad. Other districts: Sialkot, Jhang, Hafiz Abad, Chiniot, Narowal. Bajwat. Sindh Province: Districts: Sukkur, Ghotki, Kashmore, Shikarpur, Dadu, and Jamshoro. Guddu.	7/5/05	41	40	452		433.5
North-West Frontier Province: Districts: Charsadda, Nowshera, Peshawar, Swat, Chitral, Karak, and Shangla. Tapu Koroona, Sheikhabad, and Jala Bela. Dera Ismail Khan. Monda.	6/21/05	46	5	50		28.6
Sindh Province: Karachi and Hyderabad areas. Districts: Badin, Thatta, Tharparkar, Larkana, Shikarpur, Nawabshah, Dadu, Karachi, Hyderabad. Balochistan Province: Districts: Jafarabad, Naseerabad, Bolan, Jhal Magsi, Harnai, Ziarat, Khuzdar, Lasbela, Turbat, Awaran, Machh, Harnai, Kalat. Punjab Province: Districts: Sialkot, Narowal, Multan, Muzaffargarh, Layyah, Rajanpur and Dera Ghazi Khan. Jalalabad, Jhakkarpur, Bhakri, Thatti, Hamadpur, Rajapur.	7/15/03	49	285	900		868.2
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—Shinkiyari, 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).

**APPENDIX B: ASIAN DEVELOPMENT BANK WATER-SECTOR AND
FLOOD-RELATED PROJECTS APPROVED AND IMPLEMENTED SINCE 1985**

Table B.1. Cost and economic internal rate of return of irrigation-sector projects implemented by Asian Development Bank in Pakistan since 1985

Water Resources Projects	Project Cost in Million \$US	Economic Internal Rate of Return		
		RRP	PCR	PPAR
i. Small Dams Project (1985–1996)	0.39	16%	10% (6%)	8%
ii. Pat Feeder Canal Rehabilitation and Improvement Project (1985–2000)	227.90	13%	10%	—
iii. Balochistan Groundwater and Trickle Irrigation (1986–1996)	6.20	12.6% and 13.6% (no average)	12.64% and 10.4% (average 9.3%)	—
iv. Second On-Farm Water Management (1987–1995)	55.16	30%	20%	27%
v. Flood Protection Sector Project (1987–1999)	61.16	nc	+10% (sample)	—
vi. Chashma Command Area Development (1986–1995)	71.5	12%	13%	6% +/-
vii. Swabi Salinity Control and Reclamation (1989–2000)	118.00	16%	14%	—
viii. Flood Damage Restoration Project (1989–1993)	54.75	nc	nc	nc (varies)
ix. Chashma Right Bank Irrigation Project (Stage III) (1991–2005)	454.00	not available	—	—
x. Flood Damage Restoration (Sector) (1992–1999)	397.2	nc	nc	—
xi. 3rd Punjab OFWM Project (1994–2002)	—	24%	18%	—
xii. Marala Ravi Link Canal System (1994–1998)	—	nc	nc	—

Source: Ministry of Water and Power (2002).

Notes: RRP: Report and Recommendations to the President; PCR: Project Completion Report; PPAR: Project Performance Audit Report; nc: not computed; +/- indicates approximate value.

Box B.1. Pakistan Flood Damage Restoration Project

Pakistan Flood Damage Restoration Project (Asian Development Bank Loan No. 957-PAKISF)

Loan effectiveness date: June 19, 1989

Loan closing date: October 8, 1993

Project cost at appraisal: \$54.75 million (80 percent financed by ADB, 20 percent by the borrower government)

Project cost at disbursement: \$47.18 million (83.5 percent financed by ADB, 16.5 percent by the borrower government)

Main objective: Expediently reestablish economic and social infrastructure and services following floods in 1988 in all four provinces (Punjab, Sindh, North-West Frontier, and Balochistan)

Components:

- Civil works for restoration of damaged structures to pre-flood conditions: roads, flood protection and drainage infrastructure, and education facilities (included rehabilitation of 538 irrigation, flood protection and drainage infrastructure and provincial roads, and restoration of 1,491 primary schools). Costs: irrigation and drainage and flood control (\$30.66 million), roads (\$4.71 million), primary education facilities (\$7.19 million).
- Provision of consulting services (about 425 person-months). Costs: consulting services (\$0.82 million).
- Assistance in project administration. Costs: project coordination and administration (\$0.36 million).

Lessons learned:

- Slow release of local funds increases cost and decreases impact => there is a need for a facility for rapid release of funds in an emergency.
- Rapid initial economic assessment of individual subprojects of an emergency loan to determine priorities among them and improve their scope and design is necessary => focus on having advance studies on disaster characteristics.
- It is important to formulate a comprehensive flood action plan for the development and implementation of a water and flood strategy over the long term.
- The speed at which emergency projects have to be organized should not allow inclusion of unsustainable or economically or socially unjustifiable subprojects.
- High reliance on consultants resulted in better implementation but decreased capacity building of local agencies.
- The project showed the need to ensure upkeep of restored facilities, and inclusion of recovery costs as well as transfer of management of subprojects to local entities.
- The project demonstrated the need to have clear, unambiguous, and need-based selection criteria for the subproject selection process.
- It is important to have monitoring, reporting, and review and evaluation mechanisms incorporated in the design of emergency loans.

Space for improvement:

- Project took short-term restoration approach but did not include long-term perspective to prevent future floods from causing further environmental, social, and economic damage.
- Subprojects were often selected on the basis of first-come, first-served, which resulted in more accessible and better-staffed offices getting most of the funding as opposed to the funding reaching the projects that were in the most affected areas.
- Schools were also selected at random from a school sample in the flooded areas, which resulted in exclusion of many schools that were particularly badly damaged.
- Projects often favored short-term priorities over sustainability and future loss prevention.
- There was a dilemma between meeting urgent needs and focusing on long-term infrastructure improvements, which was not appropriately reconciled in the project.
- Beneficiaries of the project were not consulted in any stage of the project. There were no special efforts to promote employment of local people during implementation or arrangements for organizing them for maintaining the restored facilities.

Source: ADB (1996).

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