SUMMARY ASSESSMENT OF DAMAGE AND NEEDS

A.   Disaster Overview

1.   In the first week of September 2014, heavy monsoon rains and floods in the catchment areas of the eastern rivers of Chenab, Ravi, Sutlej, and Jhelum in Pakistan resulted in flash floods and heavy inundation. These floods damaged houses, destroyed standing crops, and blocked access to many communities in Punjab Province, Gilgit Baltistan, and districts located along Pakistan's northeastern boundary.

2.   The flood and rains affected 44 districts across the country. In 23 districts that were in the flood's path, the impact was high. The rest of the districts were affected by the extraordinary heavy rains. The 23 most heavily impacted districts were primarily affected by the flooding in the eastern rivers (particularly, the Chenab) that emanated from across their eastern and northern borders. The widest flooding was in Jhang District—2,271 square kilometers (km)—followed by Muzaffargarh (1,243 square km) and Sialkot (1,214 square km). About 668 millimeters of rainfall was recorded in 3 days in the district of Palandri and 316 millimeters in Sialkot.

3.   According to figures released by the government, 367 persons lost their lives, and more than 600 were injured. About 2.5 million people were affected overall, and more than 110,000 houses were partially damaged or destroyed. More than 1 million acres of cropland and 250,000 farms were damaged or destroyed. Nonfarm sources of livelihoods and services were also affected, since many small enterprises and manufacturing and processing units were closed due to flood damage. In terms of livelihoods, the poorest segments of the population living in the vulnerable low-lying areas and daily wage earners were those most affected by the disaster and the disruption it caused to the economy.

B.   Relief Operations

4.   The relief phase at the onset of the floods was led by the National Disaster Management Authority (NDMA) and the provincial disaster management authorities with the support of the country's army, district administrations, and the United Nations (UN). The emergency relief challenges included evacuation of stranded and vulnerable people and arranging for temporary accommodation, emergency food, shelter, nonfood items, and emergency medical care. UN organizations such as the United Nations International Children's Emergency Fund (UNICEF), the United Nations Development Program, the World Food Program, and the World Health Organization played a major role in providing technical resources, material, food, goods, and coordination. The government responded with a targeted distribution of cash and relief items in the worst–affected districts to meet urgent shelter needs. The relief efforts included distribution of more than 100,000 tents and 300,000 packages of food, along with blankets and other household items. Across the flood-affected districts, thousands of makeshift camps were erected to facilitate aid and provide shelter and health facilities to the needy. Thousands of schools, colleges, and other government and private facilities were used to provide temporary shelters for affected families.

5.   Despite the intensity of the floods, appropriate actions and reasonably effective early warning systems resulted in a coordinated effort to move people to safer places and averted greater loss of life. All essential health care and sanitation provisions to prevent the spread of disease were made available to the affected population.. The affected people were also provided appropriate shelter and transported to safer places when this was required. The large-scale relief operation resulted in a reasonably smooth return of the bulk of the population to their

places of origin without any disease outbreak or prolonged displacement. Nonetheless, the intense flooding and rains caused heavy losses to homes, crops, livestock, lands, public infrastructure, roads and other access infrastructure, irrigation and flood management works, and power supply installations. The federal, provincial, and district agencies in the affected areas managed to reopen most roads, restore electricity, and plug breaches immediately after the floods, using hired labor and machinery.

6.   The relief phase was completed successfully. The cost of this effort was not estimated because a major portion of the inputs were provided in-kind by different agencies.

C.   Early Recovery

7.   The biggest challenge after the relief phase was restoring the living conditions and livelihoods—and, ideally, raising them to levels at which people would become more resilient to future disasters. This required that structural and non-structural disaster risk reduction measures be part of all steps in the recovery process. The provincial and local governments involved undertook initial surveys and assessments to determine the immediate needs of the affected population during the recovery effort. A multisector recovery needs assessment conducted by the NDMA, the PDMAs, and the United Nations in November 2014 estimated these needs at $439.7 million, including $56.2 million for building up the resilience of the affected population and their productive assets.[1] The focus of this early recovery assessment was on livelihoods, housing, social sectors, and community infrastructure only; it did not take into account the damage to public sector assets. More than 50% of the cost of early recovery needs was for damage to housing, agriculture, and livelihoods. Another 40% was for community infrastructure essential to basic services and community livelihoods. The detailed breakdown is in Table 1.

Table 1: Recovery Needs Assessment Cost
(PRs)

Sector	Punjab Province	Other Districts[2]	Total
Housing	11,163,003,982	1,430,325,200	12,593,329,182
Crops	10,851,440,400	63,088,524	10,914,528,924
Community infrastructure	15,945,554,160	1,218,834,680	17,164,388,840
Livestock	216,000,000	17,471,160	233,471,160
Livelihood	2,723,808,000	17,790,000	2,741,598,000
Disaster resilience	250,000,000	100,000,000	350,000,000
Total	**41,149,806,542**	**2,847,509,564**	**43,997,316,106**
Total ($)	**411,498,065**	**28,475,096**	**439,973,161**

8.   The community infrastructure in the majority of the affected communities in the worst-hit districts still needs to be rehabilitated to improve conditions in and around dwellings. Infrastructure repair is essential to restore access and mobility to men, women, and children in the affected areas. It is estimated that about 7,550 micro, small, and medium-size basic community infrastructure schemes are in need of partial or full repair in these districts. This includes repairing the damage to unpaved link roads, culverts, embankments, water channels, paths and crossings, community school buildings, health services, and water supply facilities.

9.   The appeal by the Government of Pakistan for funding for the recovery phase has still not been fully met, and this phase is ongoing. By diverting development funds, the Punjab

---

[1] National Disaster Management Authority, Government of Pakistan. *Pakistan Floods 2014: Recovery Needs Assessment and Action Framework 2014-16. Islamabad.*

[2] The other districts include Bagh, Bhimber, Hattian, Haveli, Kotli, Mirpur, Muzaffarabad, Naleem, Palandri, Poonch, and Sadhnoti.

provincial government has provided compensation for all damage to private housing and partial compensation for losses in the agriculture sector, using a third-party validation process supported by national registration authority verification and interbank transfer of funds. However, compensation has not been provided for housing and agriculture damage in the affected areas outside of Punjab due to a shortage of funds. Many international and national Non-government Organizations (NGOs) have started supporting the recovery efforts in social sectors such as water supply, sanitation, health, and education. At the same time, some bilateral development partners such as the United State Agency for International Development (USAID) have diverted funds from their ongoing projects to recovery activities in social sectors.

D.   Reconstruction and Rehabilitation

10.   In November 2014, the Government of Pakistan formally asked ADB and the World Bank to prepare the damage and needs assessment (DNA). Instead, ADB and the World Bank agreed to help the governments of Punjab and the flood-affected districts outside of Punjab Province prepare their own assessments of priority short- to medium-term reconstruction and rehabilitation requirements. This approach was followed to develop the capacity of the governments and their institutions to undertake these assessments on their own.

11.   As was the case in all previous disasters, the federal and provincial governments were the principal responders and managers of the recovery and rehabilitation efforts for the flood-affected population. Immediately after the floods, the provincial governments initiated large damage and needs identification campaigns. They involved the public sector functionaries at the grassroots level to gather data on the extent of damage in the priority sectors. The ADB and World Bank teams helped the data collection teams in Punjab Province and the other districts develop data collection and survey forms and trained the key departments in their use. Once the report templates were discussed and agreed with the provincial and other district authorities, these authorities assigned teams of staff from the planning and development departments (P&Ds) and their disaster management and revenue authorities to lead the data collection process.

12.   In Punjab Province, the surveys were conducted by teams led by local officers from the districts, revenue departments, and line departments (for public sector damage). Survey guidelines and forms for the early recovery assessment in the case of housing, agriculture, and community infrastructure were issued by the Punjab PDMA. The P&Ds issued the forms for short- to medium-term reconstruction and rehabilitation needs assessment in the case of damage in the irrigation, road, health, education, and other public sectors. Teams were also required to take pictures of the damage and provide Global Positioning System (GPS) data, names, addresses, and ownership details related to damaged facilities, as well as personal information where required. The respective P&D's also issued detailed guidelines for assessing the damage percentage. Provincial secretaries coordinated the assessment in each district. Multilevel validation measures were undertaken that included (i) periodic reviews by district coordination officers and the divisional commissioners, (ii) use of a specially designed android application and web-loading of data, personal data verification by the national registration authority, (iii) triangulation of data through satellite imagery and remote sensing using the urban unit's Geographic Information System (GIS) base and satellite imagery, (iv) independent third-party validation of all public sector damage reported, and (v) a grievance redress mechanism to allow individuals to address complaints about their specific details and damage reports.

13.   Data collection in the flood-affected districts outside of Punjab Province followed a slightly different approach, with fewer validation measures. The data collection formats and

survey forms were similar to those used in Punjab Province. The P&Ds for the districts of Bagh, Bhimber, Hattian, Haveli, Kotli, Mirpur, Muzaffarabad, Naleem, Palandri, Poonch, and Sadhnoti coordinated the data collection exercise; however, each sector department was responsible for collecting its own data, using field staff and district administration staff when required. Senior staff from the same departments carried out visits to selected sites to verify the accuracy and completeness of the collected data, as well as the reconstruction and rehabilitation cost estimates. The final data was consolidated by core teams formed at the regional level that was overseen by the P&Ds for the aforementioned districts

14.   ADB and the World Bank team undertook selected site visits and triangulated the damage data and the estimates of the reconstruction and rehabilitation needs through sample analysis in selected sectors in a few geographic locations.

1. Summary of Damage

15.   The data collected by the Punjab government and the other districts for estimating the short- to medium-term reconstruction and rehabilitation needs related only to public assets. Damage to private and individual assets had already been covered by the recovery needs assessments (para. 7). In Punjab, the 2014 flood resulted in damage to public infrastructure in the social and economic sectors requiring about $139.87 million in reconstruction costs. [3] Of this, more than $104.00 million (75%) of damage costs were in transport, irrigation, drainage, and flood protection sectors. Damage in all other sectors was less significant. In the flood-affected districts outside of Punjab Province, the overall reconstruction cost of the flood damage to public infrastructure was estimated to be $129.00 million. Of this, $67.55 million (55%) represented the reconstruction costs for damaged roads and bridges and $19.49 million (16%) the costs for damage in the education sector. The reconstruction costs were less significant in other sectors. The summary of the short- to-medium-term reconstruction and rehabilitation needs of priority public sector assets is in Table 2.

Table 2: Reconstruction and Rehabilitation Needs Cost Assessment
(PRs)

Sector	Punjab	Other Districts	Gilgit-Baltistan	Total
Roads	7,196,038,000	6,755,220,000	33,600,000	13,984,858,000
Agriculture	25,863,000	75,064,000	122,075,000	223,002,000
Irrigation	3,397,438,000	72,552,000	0	3,469,990,000
Education	1,069,205,000	1,949,425,000	0	3,018,630,000
Livestock	7,220,000	22,590,000	0	22,590,000
Livelihood	1,817,000,000	–	0	1,817,000,000
Electricity/power	0	518,170,000	108,400,000	626,570,000
Environment/forests	0–	196,947,000	249,410,000	446,357,000
Water supply	0–	1,046,644,000	0	1,046,644,000
Health	116,885,000	114,179,000	0	231,064,000
LG&CD	19,186,000	1,636,206,000	0	1,655,392,000
Total	**13,926,046,000**	**12,386,997,000**	**513,485,000**	26,826,528,000
Total ($)	**139,260,460**	**123,869,970**	**5,134,850**	**268,265,280**

LG&RD = Local Government and Rural Development Department.
Note: An average exchange rate of PRS 100 = $1 is used in this table, based on the three different exchange rates used by the three different agencies that prepared the original estimates using different exchange rates.
Source(s): Government of Pakistan.

---

[3] Equivalent US dollar amounts have been calculated using an average exchange rate of $1 = PRs100. However, this is a consolidated average exchange rate from three reports prepared by different agencies.

2. Validation

16.   Validation of the data was fairly robust. However, variation in the estimation methods and issues of double counting between the early recovery and reconstruction phases was noted in the collected data. The cost estimates did not reflect the full extent of additional costs required to make the damaged public structures resilient against future disasters. The Punjab provincial communication and works and irrigation departments only estimated the cost of restoring these structures to the pre-flood state. In most cases, this was due to time and capacity constraints. Other provincial departments, such as the education department, used a much higher standard than required in estimating the reconstruction cost. In addition, sample verification of data showed that in some cases the cost estimates overlapped with early recovery costs for small schemes and social infrastructure built by local government departments. Some overlaps were also noted in the livelihood and agriculture sectors. However, these overlaps were not significant in terms of cost and could be addressed during implementation because the lead agencies are the same and a strong coordination system is in place in the form of sector clusters that operate both at the provincial and regional levels.

3. Reconstruction Strategies

17.   The separate damage assessment reports prepared by the Punjab government and for the affected districts outside of Punjab illustrate the extent of the 2014 floods and the impact that the floods had on social, economic, and physical infrastructure. The reports highlights the strategies for recovery and reconstructions in the short-, medium-, and long-term for each sector. It stresses the need for resilient reconstruction to cater for future disasters.

18.   The short-term strategy in the damage assessment reports calls for the development of enhanced mechanisms for coordination between disaster response agencies. It includes the restoration and upgrading of prioritized flood protection works, the finalization of analytical studies, and the implementation of key recommendations for physical and fiscal responses. These recommendations encompass activities such as hazard and risk mapping, flood plain mapping, multihazard-resilient reconstruction, development and implementation of plans for enhanced flood management, strategies to ensure fiscal resilience, and plans to address pressing issues such as mainstreaming disaster management in development planning and climate change adaptation and mitigation.

19.   The medium- and long-term strategies in the damage assessment reports include strengthening institutional capacities of sector institutions directly and indirectly dealing with disaster, developing a policy framework, and implementing interventions to address flood plain risks. Medium-term strategies include identifying key interventions for prevention and mitigation. On the whole, the reports stress that disaster risk management needs to be mainstreamed into development planning, and measures for monitoring and reporting disaster-related activities need to be improved. Because disaster risk management requires an integrated approach, community awareness needs to be raised. The capacity of communities not only to respond to disasters, but also to take preventive measures needs to be enhanced. The reports stress that the need for greater community awareness to improve early warning response systems. Current gaps in the early warning chain must be identified and filled with a holistic, integrated early warning system. The reports also highlight the need to conduct analysis and devise and implement climate change adaption measures. These measures need to respond to the expected hazardous effects of climate change and minimize the contribution by Pakistan's communities to climate change through adoption of eco-friendly practices.