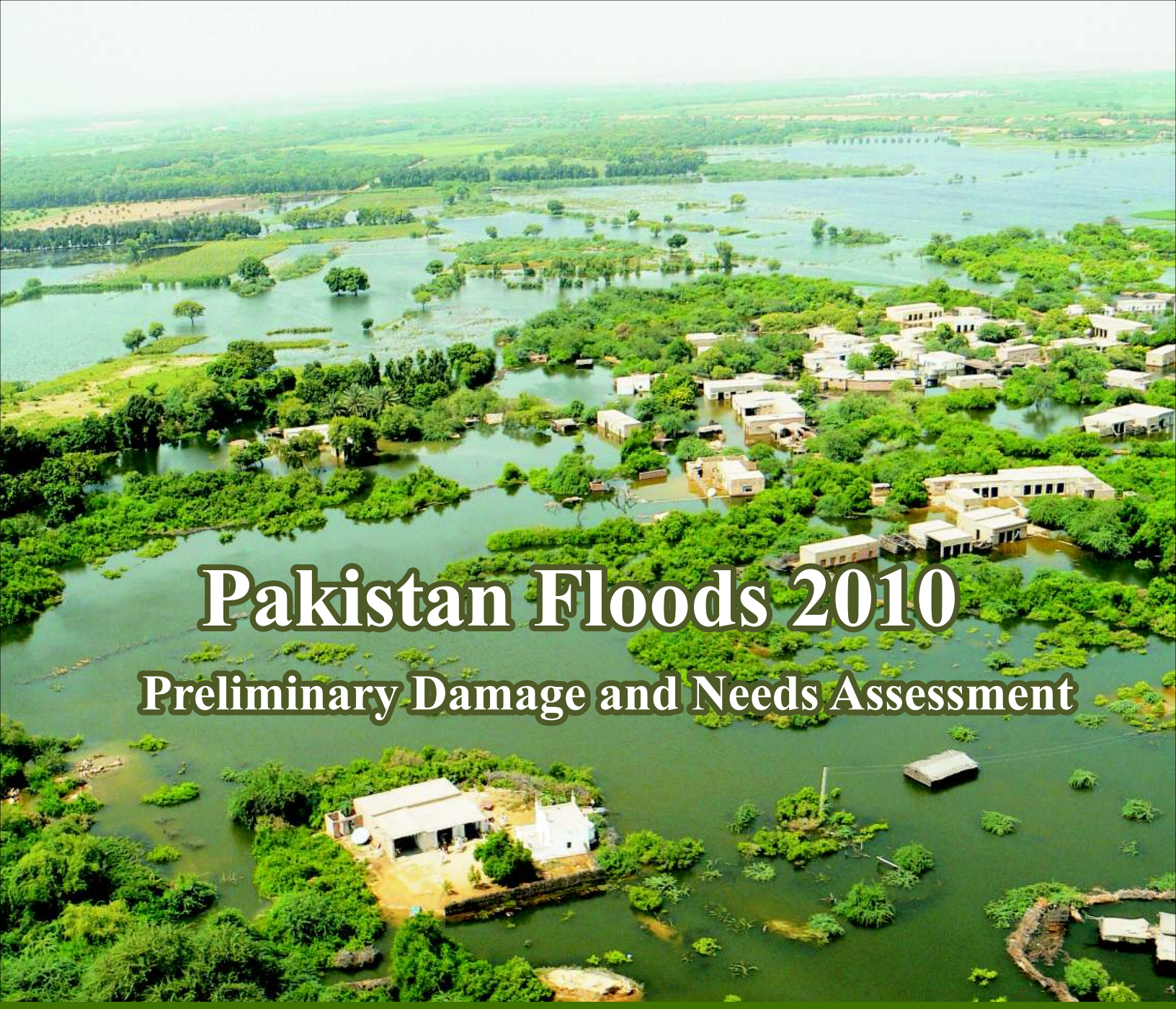

Pakistan Floods 2010

Preliminary Damage and Needs Assessment

ADB

Islamabad, Pakistan
November 2010

Title and back page photos by Gerhard Juren and M. Ismail Khan

Pakistan Floods 2010

Preliminary Damage and Needs Assessment

TABLE OF CONTENTS

LIST OF ANNEXES

LIST OF TABLES . . . . . .

ANNEX TABLES

LIST OF FIGURES

ACKNOWLEDGMENTS

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CURRENCY AND EQUIVALENTS

Currency Unit = Pakistan Rupee
US$1 = PKR 85

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AJK	Azad Jammu and Kashmir
BBB	Building Back Better
BBS	Building Back Smarter
BHU	Basic Health Unit
BISP	Benazir Income Support Program
BOD	Burden of Disease
CAA	Civil Aviation Authority
CBOs	Community Based Organizations
CCI	Council of Common Interest
CCP	Competition Commission of Pakistan
CCT	Conditional Cash Transfers
CD	Completely Damaged
CDWP	Central Development Working Party
CNG	Compressed Natural Gas
CRBC	Chashma Right Bank Canal
DDMA	District Disaster Management Authority
DDO	Drawing & Disbursing Officer
DEWS	Disease Early Warning System
DHIS	District Health Information System
DHQ	Distant Headquarter
DISCO	Distribution Company
DNA	Damage and Needs Assessment
DOH	Department of Health
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EAD	Economic Affairs Division
EC	European Commission
ECNEC	Executive Committee of the National Economic Council
EDO	Executive District Officer
EPI	Expanded Program on Immunization
ERC	Emergency Response Cell
ESSAF	Environmental & Social Screening and Assessment Framework
EU	European Union
FAO	Food and Agriculture Organization
FATA	Federally Administered Tribal Areas
FEWS	Flood Early Warning System
FFC	Federal Flood Commission
FLCF	First Level Care Facility
FMIS	Financial Management Information System

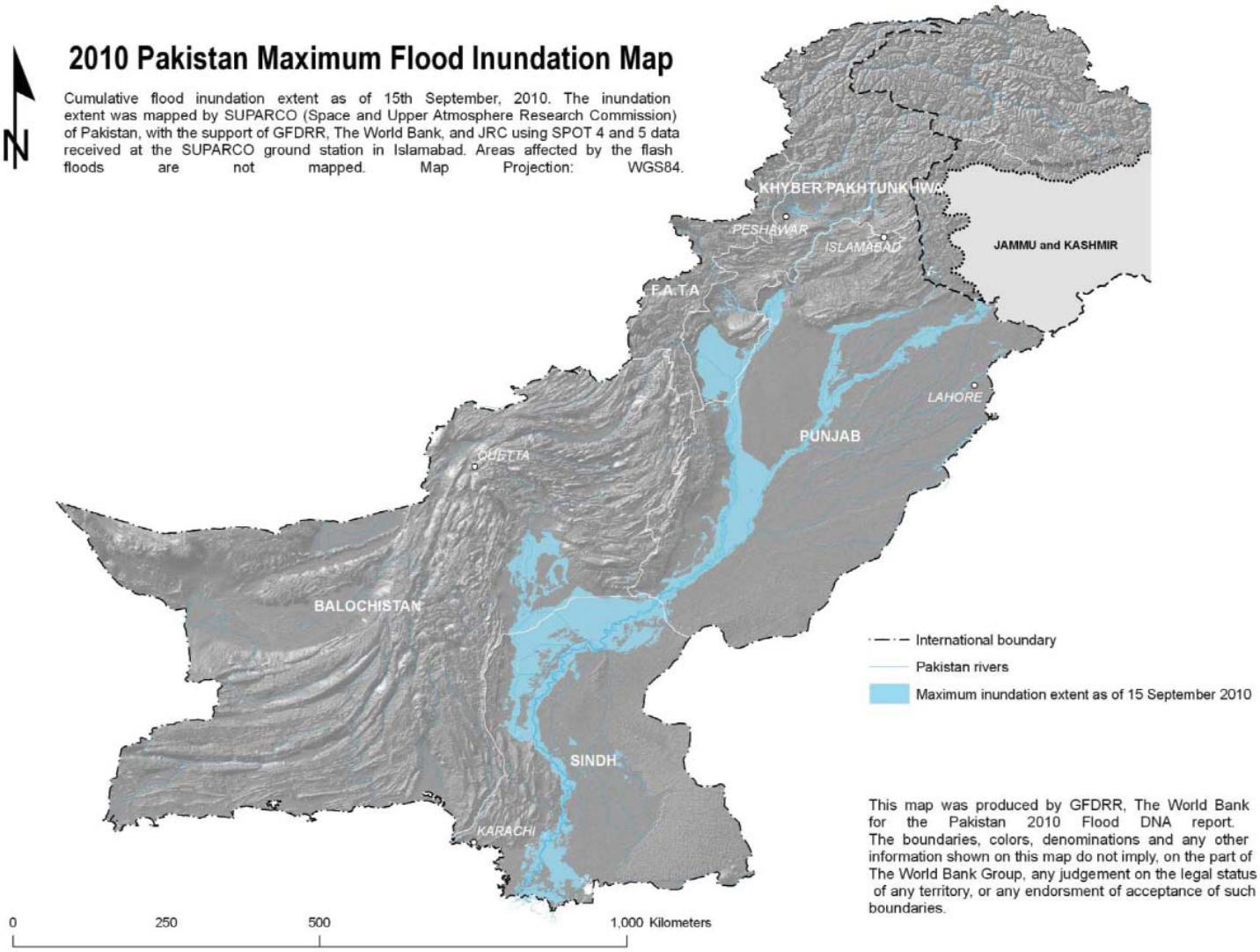
GB	Gilgit-Baltistan
GCISC	Global Change Impact Study Centre
GDI	Gender Development Index
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GIS	Geographic Information System
GOP	Government of Pakistan
GoPb	Government of Punjab
GST	General Sales Tax
GTZ	German Technical Cooperation
HDI	Human Development Index
HEPR	Health Emergency Preparedness and Response
HRM	Hazard Risk Management
ICT	Islamabad Capital Territory
IDPs	Internally Displaced Persons
IFPS	Irrigation and Flood Protection Sector
IPP	Independent Power Producer
IR	Islamic Relief
IsDB	Islamic Development Bank
JICA	Japan International Cooperation Agency
KP	Khyber Pakhtunkhwa
LG	Local Government
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
M&E	Monitoring and Evaluation
MCH	Mother and Child Health
McRAM	Multi-cluster Rapid Assessment Mechanism
MFI	Microfinance Institution
MoE	Ministry of Environment
MoF	Ministry of Finance
MoIT	Ministry of Information & Technology
MoWP	Ministry of Water and Power
MPNR	Ministry of Petroleum & Natural Resources
MTDF	Medium Term Development Framework
NADRA	National Database and Registration Authority
NBFI	Non-Bank Financial Institution
NDMA	National Disaster Management Authority
NDMC	National Disaster Management Commission
NDMO	National Disaster Management Ordinance
NDRMF	National Disaster Risk Management Framework
NFC	National Finance Commission
NGO	Non-Government Organization
NHA	National Highway Authority
NIC	National Identity Card
NODMC	National Oversight Disaster Management Council
NPLs	Non-Performing Loans
NRSP	National Rural Support Program
NTDC	National Transmission & Dispatch Company
NWFP	North West Frontier Province

O&M	Operation and Maintenance
OGDCL	Oil and Gas Development Corporation Ltd
OMC	Oil Marketing Company
PARC	Pakistan Agricultural Research Council
PARCO	Par-Arab Refinery
PC	Planning Commission
PCNA	Post Crisis Needs Assessment
PD	Partially Damaged
PDMA	Provincial Disaster Management Authority
PDWP	Provincial Development Working Party
PFMA	Public Financial Management and Accountability
PHC	Primary Health Care
PHED	Public Health Engineering Department
PIDA	Provincial Irrigation & Drainage Authority
PIFERP	Pakistan Initial Flood Emergency Response Plan
PIFRA	Project to Improve Financial Reporting and Auditing
PIPD	Punjab Irrigation & Power Development
PMD	Pakistan Meteorological Department
PMES	Project Monitoring and Evaluation System
PPAF	Pakistan Poverty Alleviation Fund
PSDP	Public Sector Development Program
PSO	Pakistan State Oil
PSP	Public Sector Power
PTAs	Parent Teacher Associations
RHC	Rural Health Center
RR	Recovery & Reconstruction
SBP	State Bank of Pakistan
SHYDO	Sarhad Hydropower Development Organization
SIPD	Sindh Irrigation & Power Development
SMCs	School Management Committees
SMEDA	Small and Medium Enterprise Development Authority
SNGPL	Sui Northern Gas Pipeline Ltd.
SOP	Standard Operating Procedure
SSGCL	Sui Southern Gas Company Ltd
SUPARCO	Space and Upper Atmosphere Research Commission
THQ	Tehsil Headquarter
UN-ECLAC	UN Economic Commission for Latin America and the Caribbean
UNICEF	United Nations Children Fund
UNIFEM	United Nations Development Fund for Women
UNITAR	United Nations Institute for Training and Research
UNOSAT	United Nations Operational Satellite Applications Programme
USAID	United States Agency for International Development
VAM	Vulnerability Assessment Mapping
WAPDA	Water and Power Development Authority
WATSAN	Water Supply and Sanitation
WB	World Bank
WFP	World Food Program
WHO	World Health Organization
WSS	Water Supply and Sanitation

WEIGHTS AND MEASURES

ft^3/sec	-	cubic foot per second
ha	-	Hectare
km	-	Kilometer
km^2	-	square kilometer
km^3	-	cubic kilometer
kV	-	Kilovolt
mm	-	Millimeter
MW	-	Megawatt
m^3/sec	-	cubic meter per second

MAP


2010 Pakistan Maximum Flood Inundation Map
Cumulative flood inundation extent as of 15th September, 2010. The inundation extent was mapped by SUPARCO (Space and Upper Atmosphere Research Commission) of Pakistan, with the support of GFDRR, The World Bank, and JRC using SPOT 4 and 5 data received at the SUPARCO ground station in Islamabad. Areas affected by the flash floods are not mapped. Map Projection: WGS84.
N
KHYBER PAKHTUNKHWA
PESHAWAR
ISLAMABAD
JAMMU and KASHMIR
F.A.T.A
LAHORE
PUNJAB
QUETTA
BALOCHISTAN
SINDH
KARACHI
International boundary
Pakistan rivers
Maximum inundation extent as of 15 September 2010
This map was produced by GFDRR, The World Bank for the Pakistan 2010 Flood DNA report. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgement on the legal status of any territory, or any endorsment of acceptance of such boundaries.
0
250
500
1,000 Kilometers

EXECUTIVE SUMMARY

Disaster Overview

1. Pakistan experienced extraordinary rainfall in mid-July 2010, which continued until September 2010. The result was unprecedented floods affecting the entire length of the country. The floods have been assessed to be the worst since 1929. According to the National Disaster Management Authority (NDMA) the rains/floods have affected over 20 million people. Additionally, flash floods and landslides triggered by the rain caused severe damage to infrastructure in the affected areas. Entire villages have been washed away, urban centers have been flooded, homes have been destroyed, and thousands of acres of crops and agricultural lands have been damaged with major soil erosion happening in some areas.

2. The overall recovery and reconstruction cost associated with the floods is estimated at approximately US$ 8.74 billion to 10.85 billion[1], which includes estimated costs for relief, early recovery, and medium- to long-term reconstruction *(Table 1)*.

Table-1: Overall Cost of the Flood

Category[2]	US $ Million
Relief	928
Early Recovery	956
Relief/Early Recovery	53
Reconstruction	6,799 – 8,915[3]

3. This report focuses on an assessment of damage and medium- to long-term reconstruction costs. It has a companion report entitled "Pakistan Floods Emergency Response Plan", which has been prepared by the United Nations. These two reports have been coordinated to ensure consistency and facilitate coordination.

About the Damage and Needs Assessment

Objective

4. In the wake of the floods, the Government of Pakistan requested ADB and WB to lead the Damage and Needs Assessment (DNA) and the One UN to lead the Early Recovery Needs Assessment in parallel. The DNA assesses the extent of the damage and the required needs for rehabilitation and reconstruction of the damaged assets and infrastructure; and restoration of livelihoods and economic productivity.

5. The objective of the DNA is: *"To provide the strategic underpinnings for medium- to long-term post-floods reconstruction, recovery planning, prioritization, and programming"*

6. This report represents a quantification and validation of physical damage and presents sector level

[1] Overall costs are presented as a range since reconstruction cost has multiple options
[2] Relief, Early Recovery and Relief/Early Recovery estimates are from UN's Pakistan Floods Emergency Response Plan
[3] Reconstruction costs range from low to high cost options

recovery and reconstruction strategies in respect of public and private infrastructure, services, and livelihoods. The quantification of corresponding needs is then done with reference to these two points, i.e. damage and sector level reconstruction strategies.

Scope

7. The DNA focuses on medium- to long-term reconstruction and provides the guiding principles for recovery. An assessment of the damage and reconstruction strategies for each sector are provided in the detailed sector assessments.

8. With respect to financial costs the DNA has been generated against three assessment categories:
   - ***Direct Damage*** refers to the monetary value of the completely or partially destroyed assets, such as social, physical and economic infrastructure immediately following a disaster. Wherever possible, the direct damage for assets is assessed in "as was" condition, i.e. at their book values;
   - ***Indirect Losses*** are income losses, and comprise both the change of flow of goods and services and other economic flows such as increased expenses, curtailed production and diminished revenue, which arise from the direct damage to production capacity and social and economic infrastructure;
   - ***Reconstruction Costs*** measure the cost of rebuilding lost assets and restoring lost services. It is generally assessed as the replacement cost with a premium added for building back smarter.

Sectors

9. The seventeen sectors covered in this DNA can be broken down into four categories: (i) cross-cutting; (ii) social infrastructure; (iii) physical infrastructure; (iv) economic sectors.

Table-2: Breakdown of Sectors

Cross-cutting	Social Infrastructure	Physical Infrastructure	Economic Sectors
• Economic Assessment • Disaster Risk Management • Environment • Social and Gender • Implementation	• Housing • Health • Education • Governance	• Irrigation & Flood Management • Transport & Communications • Water Supply & Sanitation • Energy	• Agriculture, Livestock & Fisheries • Private Sector & Industries • Financial Sector • Social Protection & Livelihoods

Methodology

10. ADB and WB DNA core teams coordinated the assessment with the Economic Affairs Division, Planning Commission and National Disaster Management Authority at the federal level, and with the provincial/state/FATA Planning and Development Departments and Disaster Management Authorities (or equivalents). Data collection for the DNA focused on secondary data available through various sources that primarily include the relevant provincial and district government departments. Data from district and *tehsil* level was collected by the government and verified and validated by the DNA sector teams. Under the DNA methodology, all secondary data received was closely scrutinized through var-

ious analyses, including statistical tools, rationality and plausibility checks and damage analysis across sectors. The data received by the DNA sector teams were validated through a number of measures including: field damage inspection visits by sector teams; interviews with stakeholders; desk review; satellite imagery and GIS data comparisons; and other plausibility checks. Based on the above, analytical work was undertaken by sector teams for a comparative pre- and post-disaster assessment of the infrastructure and services affected.

Coordination

11. The DNA team, led by the World Bank and the Asian Development Bank, were supported by the One UN, and also by bilateral donors. GFDRR provided financial support as well as technical experts for satellite image analysis, DNA framework development, trainings and so on.

Report Overview

12. The report consists of preliminary sections that contextualize the disaster by describing the background to the 2010 floods as well as Pakistan's social and economic context. The report then introduces guiding principles for reconstruction and explains in greater detail the methodology used to conduct the assessment. Next, the macro-economic impact of the floods is presented followed by a summary of the damage and needs for each sector. The report also suggests governance and institutional arrangements for implementing the reconstruction program along with an overview of cross-cutting approaches that should be taken into consideration, including social and environmental aspects, and disaster risk management and climate change considerations. The detailed sector analyses can be found in the annexes to this report. Each sector analysis gives a breakdown of damage and needs for each province as well as outlining sector-specific strategies for reconstruction.

Summary Table of Total Damage and Reconstruction Needs

13. This report presents estimates for: (i) direct damage and indirect losses, estimated at approximately PKR 855 billion; and (ii) the cost of reconstruction needs ranging from PKR 578 billion (base case option) to 758 billion (recommended option).

14. The direct damage caused by the floods is estimated at PKR 552 billion (US$ 6.5 billion) while indirect losses amount to PKR 303 billion (US$ 3.6 billion). The agriculture, livestock and fisheries sector suffered the highest damages, calculated at PKR 429 billion (US$ 5.0 billion). Table 3 provides the detailed breakdown of the damage costs.

15. Total reconstruction cost is provided across the range of three options with option one as the base case and option three as the recommended option. The reconstruction cost for the base case is estimated at PKR 578 billion (US$ 6.8 billion) while for the recommended option costs are estimated at PKR 758 billion (US$ 8.9 billion). Table 4 provides the detailed breakdown of the reconstruction costs.

-

Table-3: Estimate of Total Damage Costs by Sector

Sector	Direct Damages PKR millions	Indirect Losses PKR millions	Total Damage	
			PKR millions	USD millions
1. Social Infrastructure				
Housing	91,843	43,171	135,014	1,588
Health	1,562	2,661	4,222	50
Education	22,047	4,418	26,464	311
Subtotal	**115,451**	**50,249**	**165,700**	**1,949**
2. Physical Infrastructure				
Irrigation & Flood Management	23,600		23,600	278
Transport & Communications	62,491	50,420	112,911	1,328
Water Supply & Sanitation	3,194	6,112	9,306	109
Energy	13,184	13,116	26,300	309
Subtotal	**102,469**	**69,648**	**172,117**	**2,025**
3. Economic Sectors				
Agriculture, Livestock & Fisheries	315,547	113,257	428,805	5,045
Private Sector & Industries	14,463	9,468	23,932	282
Financial Sector	110	57,141	57,251	674
Subtotal	**330,120**	**179,866**	**509,987**	**6,000**
4. Cross Cutting Sectors				
Governance	3,141	2,835	5,976	70
Environment	992		992	12
Subtotal	**4,133**	**2,835**	**6,968**	**82**
Total	**552,173**	**302,599**	**854,771**	**10,056**

Table-4: Estimate of Total Reconstruction Costs by Sector

Sector	Reconstruction Option 1		Reconstruction Option 2		Reconstruction Option 3	
	PKR millions	USD millions	PKR millions	USD millions	PKR millions	USD millions
1. Social Infrastructure						
Housing	126,075	1,483	143,676	1,690	187,491	2,206
Health	4,151	49	4,151	49	4,151	49
Education	42,907	505	42,907	505	42,907	505
Subtotal	***173,133***	***2,037***	***190,734***	***2,244***	***234,549***	***2,759***
2. Physical Infrastructure						
Irrigation & Flood Management	36,294	427	36,294	427	83,499	982
Transport & Communications	200,260	2,356	200,260	2,356	200,260	2,356
Water Supply & Sanitation	6,292	74	6,292	74	7,982	94
Energy	9,038	106	9,038	106	9,038	106
Subtotal	***251,884***	***2,963***	***251,884***	***2,963***	***300,779***	***3,539***
3. Economic Sectors						
Agriculture, Livestock & Fisheries	21,879	257	56,925	670	89,134	1,049
Private Sector & Industries	8,636	102	8,636	102	10,923	129
Financial Sector	39,358	463	39,358	463	39,358	463
Social Protection & Livelihoods	58,076	683	58,076	683	58,076	683
Subtotal	***127,949***	***1,505***	***162,995***	***1,918***	***197,491***	***2,323***
4. Cross Cutting Sectors						
Governance	4,900	58	4,900	58	4,900	58
Disaster Risk Management	2,295	27	2,295	27	2,295	27
Environment	17,746	209	17,746	209	17,746	209
Subtotal	***24,941***	***293***	***24,941***	***293***	***24,941***	***293***
Total	**577,908**	**6,799**	**630,554**	**7,418**	**757,761**	**8,915**

Table 5 below provides the breakdown of aforementioned costs into *"physical reconstruction and procurable items" and "soft components".*

Table-5: Breakdown of Total Reconstruction Costs by Category

Sector	Reconstruction Option 1		Reconstruction Option 2		Reconstruction Option 3	
	USD millions		USD millions		USD millions	
	Physical Reconstruction & Procurable Items	Soft Components *	Physical Reconstruction & Procurable Items	Soft Components	Physical Reconstruction & Procurable Items	Soft Components
1. Social Infrastructure						
Housing	1,483	0	1,690	0	2,206	0
Health	37	12	37	12	37	12
Education	505	0	505	0	505	0
Subtotal	***2,025***	***12***	***2,232***	***12***	***2,747***	***12***
2. Physical Infrastructure						
Irrigation & Flood Management	427	0	427	0	971	11
Transport & Communications	2,356	0	2,356	0	2,356	0
Water Supply & Sanitation	74	0	74	0	74	20
Energy	96	10	96	10	96	10
Subtotal	***2,953***	***10***	***2,953***	***10***	***3,497***	***41***
3. Economic Sectors						
Agriculture, Livestock & Fisheries	237	20	650	20	1,029	20
Private Sector & Industries	0	102	0	102	0	129
Financial Sector	0	463	0	463	0	463
Social Protection & Livelihoods	0	683	0	683	0	683
Subtotal	***237***	***1,268***	***650***	***1,268***	***1,029***	***1,295***
4. Cross Cutting Sectors						
Governance	44	13	44	13	44	13
Disaster Risk Management	0	27	0	27	0	27
Environment	182	27	182	27	182	27
Subtotal	***226***	***67***	***226***	***67***	***226***	***67***
Total	**5,442**	**1,357**	**6,061**	**1,357**	**7,500**	**1,415**
Grand Total	**6,799**		**7,418**		**8,915**	

** Soft components are an integral part of physical reconstruction and both need to be implemented together*

Notes:
a/ Private Sector & Industries : Enterprise Development Fund, cash subsidies, business restoration facilitation
b/ Financial Sector : Partial credit guarantees / risk sharing facilities; re-scheduling of existing loans with interest rate subsidies; and refinancing line for liquidity support
c/ Social Protection & Livelihoods : Livelihood support grants to the severely affected households for a period of 6 months

16. A breakdown of estimated damage and reconstruction costs by province/region is presented in Table 6.

Table-6: Estimated Damage and Reconstruction Costs by Province/Area

Province / Region	Damage Costs		Reconstruction Option 1		Reconstruction Option 2		Reconstruction Option 3	
	PKR millions	USD millions	PKR millions	USD millions	PKR millions	USD millions	PKR millions	USD millions
AJK	7,303	86	13,190	155	13,886	163	16,009	188
Balochistan	52,676	620	27,258	321	34,359	404	58,116	684
FATA	6,271	74	7,595	89	7,873	93	9,544	112
Gilgit-Baltistan	4,165	49	6,627	78	6,893	81	10,027	118
Khyber Pakhtunkhwa	99,625	1,172	105,957	1,247	109,942	1,293	179,844	2,116
Punjab	219,272	2,580	93,521	1,100	107,903	1,269	117,650	1,384
Sindh	372,341	4,380	227,850	2,681	253,791	2,986	269,704	3,173
Federal / Cross Cutting Sectors	93,117	1,095	95,911	1,128	95,911	1,128	96,866	1,140
National Total	***854,771***	***10,056***	***577,908***	***6,799***	***630,556***	***7,418***	***757,760***	***8,915***

A. BACKGROUND OF THE 2010 FLOODS

Overview

17. Over the course of the monsoon season in July and August 2010, Pakistan experienced the worst floods recorded in its history. Heavy rainfall caused flash and riverine floods in the north and north-western regions of Pakistan (parts of Khyber Pakhtunhwa [KP], Gilgit Baltistan [GB], Balochistan, and Azad Jammu and Kashmir [AJK]) that combined to create a moving body of water equal in dimension to the land mass of the United Kingdom travelling southwards.

18. The high-intensity rainfall in KP generated unprecedented flood peaks in the Swat River.[4] These floods severely damaged the Amandara Headworks and washed away the Munda Headworks, both major irrigation structures.[5] The combined flow of the Swat and Kabul Rivers generated another unprecedented flood peak at Nowshera town, causing severe damage. The flood waters travelled downstream through the barrages in Punjab and Sindh until they reached the Arabian Sea downstream of Kotri Barrage. Extreme high floods were recorded at the Chasma and Taunsa Barrages, and a near historic flood peak was also recorded at the Kotri Barrage.

[4] The one-day rainfall recorded in KP on 29 July varied from 21 to 280 mm; on 30 July, 274 mm of rain was recorded in Peshawar.
[5] A flood peak of 270,000 ft^3sec^{-1} was recorded at Amandara and 300,000 ft^3sec^{-1} at Munda Headworks.

19. Many of the main irrigation canals that take water from the Indus River were also flooded, pouring water onto agricultural lands. This situation was compounded by additional heavy rains, and breaching of major canals and embankments and diversion of the water in an attempt to prevent flooding of the urban areas. The National Disaster Management Authority (NDMA) has estimated that the floods affected seventy-eight districts and covered over 100,000 square km. The floods have affected more than 20 million people, (over one-tenth of Pakistan's population) with over 1,980 reported deaths and nearly 2,946 injured.[6] About 1.6 million[7] homes have been destroyed, and thousands of acres of crops and agricultural lands have been damaged with major soil erosion happening in some areas.

National Response

20. The Government of Pakistan (including provincial governments) launched rescue and relief operations conducted by the NDMA at the federal level and relevant agencies at the provincial level, assisted by the Pakistan military and various UN agencies. Over 20,000 army troops including medical teams, along with dozens of helicopters, several C-130 aircraft and over a thousand boats, were mobilized to undertake flood relief and search and rescue operations throughout the country; and to distribute relief supplies to displaced and isolated populations. Call centers were established to receive and respond to emergency calls. Simultaneous work was undertaken to strengthen banks vulnerable to floods. In some places breaches were engineered to control floods and disrupted communication networks were quickly restored by temporary structures. As of 26 October 2010, the NDMA reported the distribution of over 1.1 million blankets; 184,035 tons of food items; and the rescue of almost 1.4 million people. To provide ready cash to the flood-affected population, the Government of Pakistan in collaboration with NADRA has distributed 977,570 Watan Cards[8] (PKR. 20,000 per family) throughout the country.

Civil Society and Private Sector Response

21. The response of international and national non-governmental organizations (NGOs) to the flood emergency was immediate, rapid and extensive. A broad range of NGOs are working with the Government to provide emergency relief support to the affected populations throughout the country. Much of the emergency relief has been in the form of clean water and water purification kits, food, kitchen sets and shelter items, sanitation kits and hygiene supplies, doctors and medical supplies, mobile and basic health care units. In addition, some NGOs have established child-friendly and female-friendly areas as a comfort haven for children and women to interact among themselves. The private sector - individuals, corporations and foundations - has contributed over US$17 million to the flood relief effort, with the majority of the funds passed on to various UN organizations and NGOs.

International Donor Response

22. Since the initial effects of the floods became evident, the international community has offered financial and technical assistance to the Government. Pledges from sixty-eight bilateral and multilateral donors totaling US$ 1,870.2 million[10] in the form of grants and in-kind contributions, have been committed to the Government for the relief and early recovery phases. As of 29 October 2010, Pakistan has received US$ 489.5 million, of which US$ 202 million has been in-kind, and has gone into meeting humanitarian and emergency relief needs (food, health/medical, water and sanitation, shelter kits, household items, generators, etc.), including logistical and manpower assistance.[11]

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[6] NDMA Situation Report October 26, 2010.
[7] World Bank/ADB DNA validated numbers.
[8] Figure as of October 26, 2010, taken from NADRA Website http://watancard.nadra.gov.pk/index.jsp
[10] Foreign Assistance For Flood Affectees, updated October 29, 2010. Ministry of Economic Affairs and Statistics, Government of Pakistan. http://www.ead.gov.pk
[11] Foreign Assistance For Flood Affectees, updated October 29, 2010. Ministry of Economic Affairs and Statistics, Government of Pakistan. http://www.ead.gov.pk

23. In August 2010 the UN launched an initial appeal for US$ 459.7 million to finance Pakistan's Initial Flood Emergency Response Plan. This was followed by the 17 September 2010 launch of the UN's largest ever humanitarian appeal for US$ 2 billion to finance projects supporting essential sectors such as shelter, food, water, sanitation, hygiene, and agriculture for a period of twelve months. The appeal was followed by a high-level meeting on Pakistan's flood crisis, hosted by the UN Secretary-General and intended to highlight the international community's solidarity with the country during this crisis.

B. PAKISTAN'S SOCIAL AND ECONOMIC CONTEXT

Political and Social Context

24. Pakistan has been characterized by a lack of policy continuity and weak implementation of reforms. Unrest in KP, FATA and Balochistan has kept the Government under pressure, diverting attention from institutional reform to matters of an ad hoc nature. The situation has marred state capacity to effectively deliver basic services for which resources were already insufficient. Major urban centers in Pakistan have witnessed civilian causalities due to terrorist attacks in the last few years. The Pakistan Army has carried out successful counter-militancy operations in the north-western parts of the country. However, the cost of this has been high[12] and Pakistan has seen 2.5 million conflict-affected internally displaced persons (IDPs).

25. Pakistan is already struggling with low social development indicators, ranking 141 out of 182 countries in the Human Development Index and with a Gender Development Index (GDI) ranking of 124 out of 155 countries. According to a 2008 UN joint assessment, it is estimated that 45 million people are severely food-insecure[13] and almost 40 percent of children are underweight. The literacy rate for over 10 years is 57 percent[14], being much higher in urban than in rural areas, and higher for men than for women. Female participation in the labor force market is 22 percent. Enrolment in official schemes is dependent on possessing a National Identity Card (NIC), but its issuance has been patchy, and more men than women have been registered (98 percent men, 71.2 percent women).[15] NADRA also confirms the registration of informal dwellers in *katcha* areas lagging behind.

26. Pakistan's economy has been struggling to regain stability since enduring the external and internal shocks in 2007/08. Even prior to the floods, there were increasing concerns about the health of the Pakistan economy. While Pakistan's external economic position improved significantly with the external current account deficit declining to 2 percent of GDP in 2009/10 and foreign exchange reserves reaching $13.1 billion by end-June 2010, and economic activity showing signs of acceleration with real GDP growing by 4.1 percent in 2009/10; fiscal performance has deteriorated and is posing a threat to economic stability. The 2009/10 fiscal deficit target, which was revised upwards to 5.1 percent of GDP only in March, was missed by a wide margin-1.2 percent of GDP--owing to a substantial over-run in electricity subsidies and other public spending and a shortfall in tax revenues. Paucity in structural reforms caused delays in mobilizing budget support from the donors, which caused the Government to yet again resort to borrowing from the central bank to finance its substantially higher fiscal deficit. Expansionary fiscal policy and monetization of government debt has added to inflationary pressures and year-on-year inflation has rebounded to 12-13 percent.

[12] The total number of civilians killed in terrorist attacks since 2001 is over 22,000 and nearly 9,000 military personnel have been killed or seriously injured.
[13] Quoted by the World Food Program at http://www.wfp.org/countries/pakistan
[14] Pakistan Social and Living Standards Measurement survey (PSLM 2008-2009)
[15] http://nadra.gov.pk/index.php?option=com_content&view=article&id=168:nadra-launches-drive-for-100pc-registration&catid=10:news-a-updates&Itemid=20

Economic Framework

27. The macroeconomic framework presented by the Government at the time of the budget was considered overly optimistic by the donor community. In any event, that framework became irrelevant due to some adverse developments. For example, the Government's fiscal framework was benchmarked to a fiscal deficit of 5.1 percent of GDP in 2009/10. When the actual fiscal data were compiled, the fiscal deficit came out much higher (6.3 percent of GDP) than the benchmark. Moreover, the large increase in revenue, and the corresponding substantial increase in federal revenue transfers to the provinces, was predicated on the introduction of VAT (or Reformed GST) from July 1. However, implementation of the tax was delayed and it is presently uncertain when the tax will be introduced. This highlights the fact that the significant improvement envisaged by the Government's macroeconomic framework in the fiscal situation in 2010/11 is no more realistic and the floods have further eroded the credibility of that framework.

C. DAMAGE AND NEEDS ASSESSMENT APPROACH AND METHODOLOGY

28. The DNA has remained a Government-led overarching and consultative assessment, with the Planning Commission (PC) and National Disaster Management Authority of Pakistan in the lead at the federal level; and the respective Provincial Disaster Management Authorities (PDMAs) and P&D Departments at the provincial level. The vast scale of damage that encompassed almost all regions of the country demanded an unparalleled level of baseline data collection spread over seven regions and seventy-five-plus districts covering fifteen sectors of the economy.

29. The assessment flexibly applied the The United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC) methodology to suit the unique country situation and the scale of the disaster. The impact of the floods on each sector of the economy includes the following three costs: (i) Direct Damage; (ii) Indirect Losses; and (iii) Reconstruction Cost.

30. Direct Damage refers to the monetary value of completely or partially destroyed assets, such as social, physical and economic infrastructure calculated at the book value, or the depreciated value of lost immovable assets. Movable assets like goods, furniture, machineries and inventories lost during the earthquake are valued at the replacement cost.

31. Indirect Losses are income losses, and comprise both the change of flow of goods and services and other economic flows such as increased expenses, curtailed production and diminished revenue, which arise from the direct damage to production capacity and social and economic infrastructure. Wherever possible damage and losses have been further split across public and private sectors to assist in macroeconomic analysis and to guide the development of public sector recovery strategies that optimally also take into account the recovery of private sector assets and services.

32. Reconstruction Costs are calculated using the replacement value (and not the book value) of assets and infrastructure. Extensive efforts were made to maintain close coordination with the UN early recovery needs assessments in order to avoid overlaps or duplication.

Build Back Smarter (BBS)

33. While calculating the reconstruction cost the principle of Building-Back-Smarter (BBS) has been applied. Under the BBS principle Building-Back-Better (BBB) has been selectively applied across sectors and within sectors to ensure a cost-optimized multi-hazard reconstruction. Under this approach,

factors for right siting and right sizing have been introduced along with larger flood protection infrastructure improvements.

Data Collection

34. To meet the challenge of collecting data from three-quarters of the country's districts, a multi-pronged approach towards damage determination, classification, collation, quantification[16] and validation was developed and implemented. Customized and criteria-based sector templates for collection, collation and classification of secondary damage data were prepared that allowed simultaneous damage disaggregation at district and *tehsil* level and re-aggregation at provincial level, thus allowing room for later data validation at various levels and using various techniques. Extensive data training sessions were held for Government officials and twenty WB/ADB data consultants were deployed in the provincial headquarters for data procurement and for extending support to provincial government departments in template-based consistent data collection. A central DNA Data Team was set up with the necessary damage and needs assessment and statistical skills that interacted closely with the field data consultants, sector teams and the provincial governments. Finally, to streamline the flow of information a web-based team room was created for data management based on specific procedures for data updating, cleaning, filtering and collation functions.

Damage Quantification

35. The process of damage and loss quantification broadly entailed the engagement and mobilization of over sixty national and international sector specialists for sector damage assessments and subsequent needs strategization and quantification; and the use of global expertise through the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) for the dissemination of good practice sector assessment notes, and provision of elaborate training in the Damage and Loss Assessment (DaLA) methodology to the sector teams and specialists.

Validation

36. Damage validation for the data provided by the government utilized multi-pronged approach including: (a) upfront data validation through desk review and detailed analysis of pre-disaster asset and infrastructure baseline data by the sector teams; (b) collective determination of percentage-based damage in sectors such as housing and the private sector for certain regions and provinces; (c) analytical validation of damage data by sector teams, employing techniques and plausibility checks such as relative-to-baseline analyses, disaggregated analysis at various levels, comparisons across vertical and horizontal streams of district and provincial data; (d) limited, sample-based physical validation by the sector teams

37. The DNA team utilized earth-observation (remote sensing/satellite) based damage validation particularly in the housing sector, and to a limited extent in the agriculture and transport sectors. The team commissioned the Space and Upper Atmosphere Research Commission (SUPARCO) of Pakistan to produce independent validation data on the damage caused by the inundation. This mapping effort was conducted in collaboration with the UN Institute for Training and Research (UNITAR), the Operational Satellite Applications Programme (UNOSAT), the European Commission (EC) Joint Research Centre (JRC) and the WB GFDRR. GIS and satellite imagery was used to map the extent of inundation and to estimate the detailed damage to housing, agriculture, and transportation facilities in twenty sample *tehsils*.

[16] Such as standardized facility and infrastructure classification and damage classification into categories of partial damage and full destruction, further divided into sub-categories.

D. ECONOMIC IMPACT

38. ***Pakistan's economy has been struggling to regain stability since enduring the external and internal shocks in 2007/08.*** Even prior to the floods, there were increasing concerns about the health of the Pakistan economy. While Pakistan's external economic position has improved significantly, as the external current account deficit declined to 2 percent of GDP in 2009/10 and SBP foreign exchange reserves rebounded to US$13.1 billion at end-June 2010, and economic activity has shown some signs of acceleration, with real GDP growing by 4.1 percent in 2009/10, fiscal performance has deteriorated and is posing a threat to economic stability. The 2009/10 fiscal deficit target, which was revised upwards to 5.1 percent of GDP only in March, was missed by a wide margin-by 1.2 percent of GDP--owing to a substantial overrun in electricity subsidies and other public spending and a shortfall in tax revenues. Paucity in structural reforms caused delays in mobilizing budget support from the donors, which caused the Government to yet again resort to borrowing from the central bank to finance its substantially higher fiscal deficit. Expansionary fiscal policy and monetization of government debt has added to inflationary pressures; the year-on-year inflation has rebounded to 12-13 percent.

39. ***Overall damage is estimated at Rs 855 billion (5.8 percent of 2009/10 GDP)***, with damages in agriculture sector amounting to Rs 429 billion (over 14 percent of sectoral income) (see Figure 1). On the other hand, rupee value of damage to the housing sector is less than one-third of that in agriculture, yet comprises almost 39 percent of the sectoral value-added (see Figure 2). With 44 percent of total (direct and indirect) damages, Sindh was the worst affected by floods, followed by Punjab (26 percent) and Khyber-Pakhtunkhwa (12 percent). The federal government also has a sizeable share (11 percent) share in total damages, although most of them are contributed by indirect losses of federally owned commercial banks and financial institutions.

40. ***The adverse impact on economic growth is likely to be substantial***. With damages to the extent mentioned above, it is inconceivable that the floods would not have a substantial impact on the economy. Economic growth is likely to suffer a significant deceleration; the impact on prices is already evident with monthly inflation registering the highest increase in over two years; public finances would also be affected due to large-scale increase in flood-related expenditures; and balance of payment is like-

Figure 1: Flood Damages by Sectors

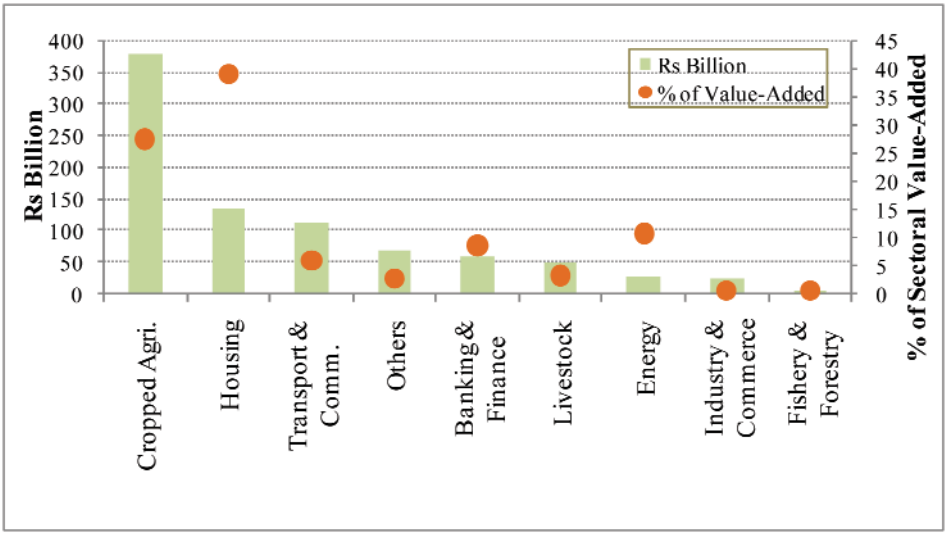
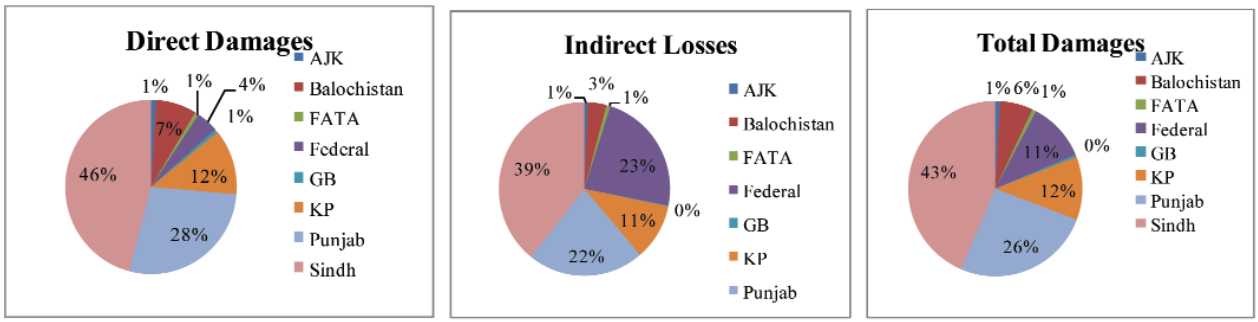


Figure 2: Geographical Distribution of Floods Damages



ly to come under pressure as exports would slow down and imports accelerate.

41. ***Agriculture has been the most severely affected sector***, accounting for a full 50 percent of the estimated cost of overall damages. The overall damages and losses to the sector are estimated to be around Rs 429 billion (of 14 percent of the sector value added in 2009/10), most (89 percent) of which are attributable to cropped agriculture. As all of the crops affected by floods were ready for harvest, almost all of these damages can be taken as loss in sub-sectoral value added. This implies that the value added in crop agriculture, which was targeted to increase by 3.5 percent in 2010/11, is now projected to decline by about 10 percent (from the level of 2009/10), with major crops showing a decline of about 7 percent and minor crops of 20 percent. However, timely action by provincial agriculture departments, in terms of providing the seed, extension services to encourage alternative crops[17] can reduce the growth losses in the sub-sectoral value added by 0.5 percentage points. Although livestock sector too suffered some heavy losses the overall direct and indirect losses in the sector are estimated to be Rs 48 billion (i.e. only 3 percent of sub-sectoral value added). As such, despite the loss of large number animals, value-added in the sub-sector will decline only by 0.6 percent and the sub-sector is still expected to show a reasonable growth of 3.5 percent. On the other hand, negligible damage is done to fisheries and none to forestry sub-sectors.

42. While industrial sector was not unduly affected by the floods, it too would see a significant slowdown due to input losses that the textile and food preparing sectors are likely to face. The slowdown in commodity producing sectors, disruption of economic activity and heavy damage to infrastructure would result in some deceleration in services sectors despite the positive fallout of reconstruction activity.

43. ***Inflation is likely to remain high***. During 2009/10, headline inflation averaged a relatively high 11.7 percent, but it had been expected to decelerate this year. However, at end-September 2010, the month-on-month headline inflation surged by 2.7 percent (highest increase over two years). This increase in the monthly headline inflation is driven by post-flood price increase of perishable and non-perishable food items. On month-on-month basis, prices of perishable food items increased by 14 percent in September, while that of non-perishable food items increased by 3.6 percent. Although, this may be a temporary acceleration in prices resulting from flood damages to crops, heavy government borrowing from the banking system to meets its burgeoning expenditure is likely to exacerbate the problem. To counter these inflationary trends, the State Bank of Pakistan (SBP, the central bank)

[17] The federal and provincial governments are presently contemplating "agricultural packages" which will provide subsidy (in cash or kind) to the farmers to ensure adequate supply of seeds, fertilizers and other implements and inputs for the next cropping cycle subsidies. In Sindh, where the fear of delayed sowing of winter crop (especially wheat crop) is the highest, the provincial government is considering encouraging sowing of sunflower crop, which can be sown in November or even December, rather than wheat, which has to be sown in October.

is moving to mitigate price pressures, and raised the policy interest rate by 0.5 percent in July and by another 0.5 percent (to 13. 5 percent) in September.

44. ***Government's fiscal position is likely to get weaker as a large proportion of relief, rehabilitation and reconstruction cost would be borne by the government.*** The 2009/10 fiscal deficit was 6.3 percent of GDP (compared to a target of 5.1 percent), owing to a substantial overrun on electricity subsidies and other public spending as well as shortfalls in tax revenues. The estimates of overall reconstruction cost range for Rs 662 billion (4.5 percent of 2009/10 GDP) to Rs 779 billion (5. 3 percent) depending on mode of reconstruction. While reconstruction and rehabilitation of damaged infrastructure would be spread over 3-4 years, relief activities and restoration of even the basic public infrastructure and services (roads, bridges, railway tracks, irrigation system, schools, health centers, and power sector installations) will require substantial outlays. Rationalizing and reprioritizing the existing development budget could yield some fiscal space, but overall, the floods may add significantly to the budget deficit in 2010/11. A higher fiscal deficit would imply a larger build up of public debt, having adverse fiscal and economic implications for future.

45. ***Balance of payments may also come under pressure.*** Even before the floods, the current account deficit was projected to widen slightly in 2010/11 from the 2 percent of GDP registered in 2009/10. The disaster is expected accentuate this trend, mainly by increasing the trade deficit. Notwithstanding the positive impact of EU granting Pakistan an enhanced market access for a limited time (one year), export performance is likely to weaken, as the textile sector is impacted by the need to source some 2 million bales of cotton that may have been lost due to crop damage, and a promising new export - cement - will now have to be diverted to domestic consumption. In contrast, reconstruction and rehabilitation will require a significant increase in imports particularly of food, medicines, fuels, construction materials, and machinery. Workers' remittances are likely to continue playing an important role in financing household consumption in Pakistan. Still, substantial external finance will need to be motivated in order to sustain international reserves, which remained steady at US$12.2 billion at the end of August, 2010.

E. SUMMARY OF DAMAGE AND NEEDS BY SECTOR

46. This section provides an overview of the damage and recovery/reconstruction requirements by sector. Detailed assessments of each sector are provided in the attached annexes.

Housing

47. ***(a) Damage - US$ 1,588 million:*** The floods caused total or partial damage to more than 1.6 million housing units across the country. An estimated 913,307 houses have been completely destroyed[18] and another 694,878 partially damaged[19]. As expected, the extent of damage incurred to *katcha* houses has been far higher at 19 percent of the pre-disaster *katcha* housing stock (1.45 million housing units), out of which, 847,455 *katcha* housing units have been completely destroyed. Among provinces, the housing stock in Sindh has been the worst affected, with almost 880,000 housing units completely or partially damaged, which is 55 percent of the total affected housing stock across the country. By contrast, only 3 percent of total *pucca* housing stock (156,000 housing units) has suffered damage, with about 65,000 being completely destroyed. The direct damage to housing, reflecting the depreciated value of the affected stock, is USS 1,081 million (USS 795 million for completely destroyed houses and USS 285 million for partially damaged houses). These are based on the aver-

[18] This primarily includes completely washed away, fully collapsed, or structurally damaged houses with foundation failure or erosion of supporting walls
[19] This mostly includes cases of roof damage and repairable damage to walls, etc.

age housing unit sizes across all affected districts in each province, derived from the average number of rooms in a typical house reported for each district in the 1998 census. The cost of a typical *katcha* and *pucca* house has been estimated using unit material and labor costs collected from the field by the DNA team. Indirect losses including: depreciated value of housing assets, appliances and fixtures; value of damaged water and sanitation infrastructure; cost of debris removal and demolition; and cost of providing temporary shelter to affected households, are estimated to be USS 508 million.

48. ***(b) Strategic, Implementation and Cost Options for Housing Reconstruction:*** Since the affected area is prone to multiple hazard risks (floods, earthquake and landslide), reconstruction of houses should be based on appropriate cost-effective, hazard-resistant engineering standards as far as possible. While this approach will, to some extent, increase initial reconstruction costs, it will constitute the most economically efficient solution when viewed over the full useful life of these investments. It is strongly recommended that the Government require the adoption of flood-resistant engineering designs and construction standards as a condition for disbursement of housing reconstruction grants to all eligible affectees living within the fifty year floodplain. This option has been costed for the purpose of this report as Option-2. However, houses located in the 5-year flood plain will need to be relocated outside it.[20] Similarly, in areas that are prone to significant seismic risk (Seismic Zones 2B, 3 and 4 according to the Building Code of Pakistan 2007), housing reconstruction must cater for appropriate seismic-resistant standards, to minimize the risk to life and property, and to reasonably secure the proposed investments over their useful life. Housing made of *katcha* construction is not recommended in such areas, since significant seismic resistance cannot be ensured for *katcha* construction.

49. ***(c) Recovery/Reconstruction Needs:*** The reconstruction and repair needs for housing have been calculated for the three Options, and range between US$ 1.483 and 2.206 billion. These estimates are based on replacement of a destroyed house with a core unit of 500 sq. ft covered area, calculated on the basis of currently prevailing prices of materials and labor. Option-1, costing US$ 1.483 billion, is a base case, providing for a uniform subsidy for Building-As-Before calculated on the basis of a *katcha* core unit. It is not recommended and is provided for comparison purposes only. Option-2, costing US$ 1.690 billion, offers a Partially Differential Subsidy providing for restoration to flood-resistant standard for those units that are located within the flood hazard area. It is recommended only for districts in Punjab and Sindh that are not at seismic risk. Option-3, costing US$ 2.206 billion, provides for a Differential Subsidy for Building Back Better to applicable multi-hazard-resistant standards for units at risk of flood and/or earthquake - while building as usual in non-risk prone areas. It is the recommended Option providing for optimal use of scarce public resources, while ensuring adequate hazard resistance proportionate with the relative hazard risk exposure and structural vulnerability of houses in the affected districts.

Health

50. ***(a) Damage - PKR 4,222 million (US$ 49.67 million):*** The floods resulted in mild to moderate damage to the country's public health infrastructure, including basic health units and dispensaries, which suffered the most damage. However, most of the secondary health care facilities were unaffected. Out of 9,271 health facilities across the country, a total of 515 (5.3 percent of the total) have been partially damaged or completely destroyed. In the two worst affected provinces, KP and Sindh, about 11 percent of total health facilities in the affected districts were damaged or destroyed, followed by 8 percent in FATA. Damage to health facilities in the rest of the country's floods-affected areas total 2 percent or less.

[20] Relocation costs are not reflected in the cost estimates.

51. ***(b) Recovery/Reconstruction needs - PKR 4,151.5 million (US$ 48.84 million):*** The short, medium and long term needs for the sector have been estimated at PKR 4,152 million (US$48.84 million). A total of PKR 1,028.5 million (US$ 12.1 million) will be required to implement the short-term strategy, while PKR 3,123 million (US$36.74 million) is required for the medium- and long-term reconstruction and rehabilitation of damaged health facilities. In the short-term, strategies should focus on establishing essential health services packages (primary health care, emergency obstetric care, response to disease outbreak, supply of essential medical supplies, etc.). Cross-cutting issues such as care for particularly vulnerable groups (women of reproductive age, children and the elderly) should also be addressed as a priority. In the medium- and long-term, a comprehensive health sector revitalization strategy should aim at the provision of minimum standards for health care, based on the key principles of equitable access to essential health care, timeliness, results, and accountability.

Education

52. ***(a) Damage - PKR 26,464.3 million (US$311.3 million):*** The unprecedented floods have damaged a total of 10,407 educational institutions in the country of which 3,741 are fully destroyed and 6,666 are partially damaged. However, affected institutions are only 6.2 percent of the total institutions in the country and 12 percent of the total institutions in the affected districts. The two worst affected provinces (in terms of numbers) are Sindh and Punjab, where 18.5 percent and 8.8 percent of the pre-flood educational facilities have been damaged or destroyed respectively, followed by 12.9 percent and 5.6 percent of pre-flood facilities damaged in Balochistan and KP.

53. ***(b) Recovery/reconstruction needs - PKR 42,906.58 million (US$ 504.8 million):*** Recovery needs are estimated as PKR 42,906.58 million (US$ 504.8 million) including PKR 5,410.575 million (US$ 63.7 million) for short-term needs. Efforts in the short-term should ensure that the educational process continues in the affected districts. This will also contribute to restoring the community's confidence in government's ability to continue basic service delivery. Ensuring teacher availability, basic shelter, replacing the textbooks lost to the floods, fumigation of surviving school buildings and those being used by IDPs, and vaccination of children are among the basic and immediate requirements to continue the education process. Long-term reconstruction warrants reviewing some aspects of the policy. For example, location of schools in terms of accessibility and maximum utility and involvement of school management committees/Parents Teachers Associations in rehabilitation and repair work is highly desirable. First among the post-DNA follow up actions will be to conduct a detailed facility-by-facility survey to determine actual needs of each educational facility. The Government will not be able to carry out all repair and reconstruction work alone, therefore, communities and credible NGOs will have to be fully engaged in reconstruction and revival work. This may require capacity building of district officials to monitor the processes and establishing working relationships with communities and local credible NGOs.

Irrigation and Flood Protection

54. ***(a) Damage - PKR 23,600 million (US$ 277.6 million):*** The most extensive damage occurred in Sindh province (PKR 11,638 million/US$ 136.91 million) followed by KP (PKR 5,810 million/US$ 68 million). Damage to WAPDA facilities is estimated at PKR 416 million (US$ 4.9 million). The damage estimates reflect the reconstruction requirement at depreciated value as most of the sector's infrastructure is more than fifty years old. Indirect losses such as damage to crops due to flooding and disruption of irrigation supplies, siltation and water-logging of agricultural land are covered by the DNA for the agriculture sector. Irrigation departments in Balochistan, KP, Punjab and Sindh expect to have restored essential irrigation supplies by the start of the winter crop season in November 2010.

55. ***(b) Recovery/reconstruction needs - PKR 83,499 million (US$ 982.35 million):*** The irrigation,

drainage and flood protection sector reconstruction strategy includes restoration of canals, drains and public tubewells, and strengthening vulnerable and damaged components of barrages and river training works in the short-term-6-12 months. The cost of the short-term measures is estimated at PKR 13,208 million (US$ 155.4 million). The medium-term program includes reconstruction of significantly damaged infrastructure and building-back-safer measures against flash floods, i.e. floods protection and river training works, for settlements and urban areas in KP and the northern regions and for increasing the freeboard of some flood protections works in Sindh. This program will be completed within 2-3 years at an estimated cost of PKR 70,291 million (US$ 826.95 million). In light of the severity of the floods damage and losses, it is recommended that the Government reviews its current flood management strategy. The revised strategy should consider: (i) enhancing the absorptive capacity of the catchments to reduce rainfall run-off, (ii) building additional reservoirs to absorb flood peaks, (iii) improving flood regulation through diversions, (iv) enhancing the safe flood disposal capacities of the existing barrages and river training works, (v) adopting a "living with the floods" approach for the riverine areas in Punjab and Sindh, (vi) improving and expanding flood forecasting and early warning systems, and (vii) enhancing evacuation and flood relief capacities.

Transport and Communications

56. ***(a) Damage - PKR 112,911 million (US$ 1.3 billion)***: The transport and communications sector consists of various categories of roads, railways, bridges, civil airports, and telecommunications infrastructure. Preliminary estimates indicate that 10 percent of the road network (approximately 25,000 km) and 16 percent of the railways (1,225 km) were damaged by the floods. Within this sector, the road subsector sustained the highest damage and losses (US$ 1.2 billion) followed by the railway subsector (US$60 million). Damage to telecommunication infrastructure includes optical fiber transmission lines, feeder cables and, in some cases, transmission towers and equipment (US$ 35.0 million). The airports sustained only minor damage (US$ 0.7 million). The disruption to the road and rail network has a two-fold impact on the mobility of the affected population: returning to the villages is difficult and, once returned, access to markets and basic services is curtailed. While some of the national highways and rail network are expected to be restored in the short-term, the district and municipal roads network will continue to hamper rehabilitation and access to basic services - health, education, markets, public services, and communications in the medium- to long-term.

57. ***(b) Recovery needs - PKR 196,466 million (US$ 2.31 billion):*** The reconstruction needs of the sector have been estimated at US $2.31 billion with the reconstruction needs for the road sub-sector estimated at US$ 2.07 billion.[21] For telecommunications, the private sector operators mobilized quickly, carried out the repairs, and restored telecom services. For roads and railways, the embankment breaches were plugged, railway line repairs were undertaken, and rail traffic was largely restored. Repair of the minor damage to airports is underway. For the national highways that provide international and inter-provincial road connection, landslides debris was removed, bailey bridges were installed on damaged bridge sites, and temporary repairs were undertaken to restore traffic. For provincial highways and districts and municipal roads, only minimal work has been carried out on critical sections. Reconstruction costs for telecommunications, railways, civil aviation, and 10 percent of the road construction costs are included in the short-term recovery phase. In the medium- and long-term the focus will be solely on the remaining road reconstruction effort.

Water Supply and Sanitation

58. ***(a) Damage - Up to PKR 3,195 million (US$38 million)*** in estimated damages to public assets.[22] Indirect losses amount to PKR 6,112 million. Some 81 districts and over 230 *tehsils* experienced

[21] Many parts of Sindh province remain flooded and, therefore, reconstruction estimates are on the high side.

flood damage to water supply and sanitation (WATSAN) infrastructure. The severity of damage varies between geographical areas, with structural damage more extensive and destroyed schemes more likely in KP and mountainous areas. Flash floods have caused serious structural damage to pump houses, storage tanks, and pipes in mountainous districts. Where flooding has been less violent but more extensive in scope and duration, as in Sindh, damage is primarily to electrical and mechanical components, pumping machinery, transformers, building foundations, and sewerage and drainage systems, including vast damage to street pavements and drains, requiring extensive cleaning, de-clogging, de-watering and re-soling. Except in areas subject to flash flows, most schemes suffered only minor damage. While at community level, damage to pavements and drainage is devastating, leaving communities in mud and stagnant water, damage costs are relatively low. Little solid waste management infrastructure was reported damaged by the flood, which is testimony to its absence in flood-affected communities. In contrast, damage to private WATSAN assets, reported in the Housing Sector Annex, exceeded estimated damage to public assets, signaling the critical role the private sector plays in WATSAN service delivery.[23]

59. ***(b) Recovery needs - Up to PKR 7,982 million (US$94 million)*** for physical reconstruction, including priority enhancements for technical efficiency, to protect against future disasters, and to enhance sustainability of recovery investments. Reconstruction and recovery should aim to re-establish services to households, not simply make physical repairs. The objective should be to reestablish services and promote sustainable WATSAN services so that investment in recovery is not wasted. The recommended investment to Build-Back-Better will also initiate a few essential reforms undertaken hand-in-hand with the recovery actions. Short-term priorities are estimated at PKR 3,364 million (US$ 40 million) to clean up and undertake priority repairs; followed by planning and designing for better or smarter replacements or modifications to infrastructure. Hygiene promotion will be essential primarily to reduce health risks, but should also be used to encourage consumer demand for WATSAN services in the longer term. Medium- and long-term actions are estimated at PKR 4,618 million (US$ 54 million), and should build on the strong foundation of baseline service data, asset inventories, Build-Back-Better recommendations and investment plans begun in the first phase.

Energy

60. ***(a) Damage - PKR 26.3 billion (US$ 309 million):*** This comprises direct damage of PKR 13.2 billion (US$ 155 million) and indirect damage of PKR 13.2 billion (US$ 154 million). Damage was split fairly evenly between the power sector (total damage PKR 13.1 billion / US$ 155 million) and the petroleum sector (total damage PKR 13.2 billion / US$ 155 million). In the power sector the majority of the direct damage is to the distribution network and the hydroelectric power generation stations. It is estimated that approximately 3.5 million people are without power due to distribution network outages, with most of the affected population in Sindh, the Multan area and KP. There is also damage to several micro- and mini-hydro facilities which will have little impact on national generation capacity but will adversely affect many remote communities that are serviced solely by these facilities. Damage to the petroleum sector is moderate representing only 1 percent of the annual oil imports by the industry. Oil supplies to some power generation facilities and public retail outlets were suspended, and gas supplies to over 240,000 people are cut off mainly in Balochistan and Sindh. Generally, however, a reasonable level of services and supplies are maintained to the affected areas. About 47 percent of disruptions occurred in the downstream gas transmission and distribution companies, followed by 31 percent for downstream oil sectors (oil refineries, marketing and distribution

[22] This includes PKR 1,512 million (US$18 million) for Sindh province. Sindh figures remain speculative, and require further validation once the flood waters fully recede. Sindh figures were subject to a reduction of 66 percent based on a comprehensive review of damaged schemes reported by Public Health Engineering Department (100 percent of reported damaged schemes were validated).

[23] Damage to WATSAN facilities at household level is estimated at PKR 4,532 million (US$ 53 million). This related to damaged hand pumps, motors for water supply, underground and roof-top storage tanks, and household latrines. Reconstruction costs related to household sanitation are included under housing.

companies), and 22 percent by upstream oil and gas companies. Reported damage is concentrated in the public sector petroleum companies (98 percent).

61. ***(b) Reconstruction needs - PKR 9.03 billion (US$ 106.3 million):*** This covers direct damage for the public sector power companies plus PKR 850 million (US$ 10 million) for capacity building. Needs for the petroleum sector public companies are PKR 2.8 billion (US$ 33 million) as about 49 percent of the total damage for public companies is estimated to be covered by insurance. Key recommendations include fast track infrastructure restoration by diverting resources to restoration activities including utilizing existing stores and existing civil works contractors, fast track procurement for continuous replenishment of stores, accelerated implementation of national compact fluorescent lamp program in affected areas in order to reduce power demand and offset generation shortage, provision of free solar lanterns to affected areas where power has been disrupted, and establishment and implementation of emergency standard operating procedures. Recommended policy actions for the energy sector include establishing policies for unrecovered receivables from customers in the affected areas, and for compensation to public sector companies for providing free electricity or gas to flood affectees.

Agriculture, Livestock & Fisheries

62. ***(a) Damage - PKR 428.8 billion (US$ 5 billion):*** In the more hilly areas affected by flash floods, mainly in AJK/GB, KP and Balochistan, the rapid and unexpected flow of water swept away people, houses, crops, livestock and stores of feed, food and seed. In the plains, crops were destroyed but as the flood was slow moving, most people were able to relocate themselves, their valuables and livestock to higher areas. The total damage in crops, livestock and fisheries sub-sectors is estimated at about US$ 5.0 billion. Among the provinces, Sindh suffered most with 46 percent of total damage, followed by Punjab (36 percent), Khyber Pakhtunkhwa and Balochistan (8 percent each), and the rest in AJK and GB. The losses were largest for **crops** (89 percent of total damage) with direct damage to: 2.1 million ha of standing Kharif crops - mainly cotton, rice, sugarcane and vegetables; 1 million tons of food and seed stocks; and a large number of on-farm water channels and tubewells. Further indirect damage may occur as forthcoming crops are not planted due to problems of land preparation and inputs. There is concern about the possible impact of reduced wheat output in the coming season on food security. **Livestock** damage accounts for 11 percent of total damage. A substantial number of livestock were washed away and killed during the flash floods in the hilly areas of KP and Balochistan, while grazing animals and poultry were lost also in the plains area. **Fisheries** were affected as a number of fishponds and public and private hatcheries were washed away or damaged.

63. ***(b) Recovery/reconstruction needs - PKR 21.8 billion to 89 billion (US$ 257 million to 1.04 billion)*** Reconstruction needs have been estimated for three scenarios and include the costs for bringing normalcy in the agriculture, livestock, on-farm water management and fisheries sub-sectors. The range given is for the lowest to the highest costing scenario. The team has also costed the interventions for improving key policy and regulatory frameworks.

Private Sector & Industries

64. ***(a) Damage - PKR 23,932 million (US$ 282 million):*** While the major industrial hubs of the country have largely been spared, the floods have seriously damaged micro-, small and medium enterprises in manufacturing, trade and services sectors in the affected districts. Direct damage was estimated to be PKR 14,463 million (US$ 170 million) while indirect damage/losses were calculated at PKR 9,468 million (US$ 111 million). The largest share of damage was to shops, followed by industry, and Sindh province was the worst affected. In Sindh and Punjab, cotton ginning, sugar, rice processing and flour mills are the main sectors damaged by floods, while in KP they are marble, furniture, silk,

horticulture, mining and tourism. Along with direct damage, the floods have also adversely affected the livelihoods and household incomes of the affected communities. The unlikely recovery of informal credit extended to cotton farmers and the likely increase in production costs due to use of imported cotton are expected to reduce the competitiveness of Pakistani textile products in international markets.

65. ***(b) Recovery/reconstruction needs - PKR 8.6 billion - 10.9 billion (US$ 102 to 129 million):*** Reconstruction/recovery of the private sector should be carried out following a holistic and integrated approach. It is very important that the proposed strategy is implemented through an arrangement based on public-private partnership model. The strategy should have measures for immediate restoration of livelihoods and resumption of normal business activity. It should also include medium- to long-term measures for sustainable economic development in the affected areas. Immediate steps in this regard include supporting businesses through matching grants for reconstruction of buildings, restocking of goods and maintenance of machinery and equipment. Provision of rescheduling of existing loans and easy access to new financing on easy terms should be included in the reconstruction strategy. Restoration of utility infrastructure should be ensured on a priority basis for the restart of closed industrial units in the minimum possible time. Marketing access for affected businesses should be improved by giving them preferential treatment in government procurement and getting concessions in duties in the international markets to increase their exports. In the long-term scenario, provision of business development services in the affected districts should be improved by engaging organizations like SMEDA. Complete mapping of the private sector should be carried out for establishing credible baseline numbers. Capacity building programs in technical and vocational education should be strengthened in the affected districts. Insurance of private sector assets should be facilitated through cost sharing support to reduce losses in case of any future disaster.

Financial Sector

66. ***(a) Damage - PKR 57,251 million (US$ 673.5 million):*** The impact of the floods on the financial sector has been assessed primarily through the impact on the banking sector, the microfinance sector, and the Non-Bank Financial Institutions (NBFI) sector with particular focus on the insurance industry. The estimated physical damage amounts to PKR 110 million (US$1.8 million) of which PKR 76 million is in the commercial banking sector while PKR 34 million is to microfinance institutions (MFIs). Loan losses are over PKR 83 billion (about US$ 1.0 billion); the banking sector constitutes 93 percent of the total (about PKR 79 billion) while the remainder is in MFIs and the insurance and leasing sectors. The largest share of loan losses of 55 percent is of the agriculture sector, while loan losses of SMEs and housing are 20 and 4 percent respectively. Amongst the provinces the largest share of losses is in Punjab (63 percent) followed by Sindh (19 percent) and KP (13 percent). While banks' NPLs in the affected areas have more than doubled, they are still not that significant as a proportion of their overall portfolio of outstanding loans. However, one specialized agriculture bank alone represents about 38 percent of the total NPLs in the affected districts and could face capital constraints.

67. ***(b) Recovery/Reconstruction needs - PKR 39 billion (US$ 463 million):*** It is still too early to give precise figures relating to the full extent of the damage and these estimates should be treated with caution until a clearer picture emerges with the passage of time. Recommendations for the banking sector include: (i) Establishing incentive mechanisms to extend fresh credit in the affected areas for revival of business activities particularly for agriculture and Medium to Small Medium Enterprises (MSMEs). This will require concerted efforts and flexible and new products to expand outreach to cater to emerging needs. For this a **Partial Credit Guarantee/ Risk Sharing Facility** can be structured; (ii) Moratorium on existing loans/**rescheduling with interest rate subsidy**. However clearly

defined eligibility would have to be worked out to target the subsidy where it is intended and must be time bound; (iii) **Refinancing line** for liquidity support. In the case of the MFIs, some write-off may be unavoidable due to the loss of livelihoods of the clients and the impact on their capacity to pay. Proposed interventions in the microfinance sectors could include a **Risk Mitigation/ Capital Protection** Fund which would also provide them the liquidity needed for fresh credit requirements, a moratorium on old loans/rescheduling of repayment period, new capital recovery loans as well as rescheduling of loans with creditors including PPAF. Overall, the situation also presents the Government a good opportunity to focus on financial inclusion and increasing outreach and coverage of the potential market.

Social Protection and Livelihoods

68. ***(a) Needs -PKR 58 billion (US $683 million):*** A preliminary conservative estimate suggests that around 2.9 million households are affected of which 1.9 million (66 percent) have been severely affected. Addressing the short-term needs of these severely affected households for a period of six months would notionally require PKR 58 billion (U$ 683 million). The estimates have been reached using two specifications to test the accuracy. The annex 17 provides details of both the specifications; however, the higher estimates have been used for overall costing of this report.

Governance

69. ***(a) Damage - PKR 5.9 billion (US$ 70.3 million):*** The direct damage to governance institutions has been considerable, with nearly 1,437 critical public service buildings and facilities affected. Local government infrastructure and post offices have been hit the hardest. In KP, the police force, which is at the forefront in the battle against militancy, was already overstretched due to the volatile situation in the province. Punjab police operations have also been affected by the floodwater in different districts of South Punjab. The capacity of Sindh police in various districts has also been tremendously constrained due to flood damage. Across the country, land records have also suffered partial damage. Indirect losses and strains on public administration systems are more critical and need to be addressed. Broadly speaking: (a) capacity to govern reconstruction has diminished over time and will be further exacerbated by the floods; (b) IDPs' entitlements are under risk; and (c) the public security climate in Sindh, KP and Punjab due to diminished capacities is worrisome.

70. ***(b) Recovery/reconstruction needs - PKR 4.9 billion (US$ 57.65 million):*** This cost includes rebuilding vital infrastructure and improving the procurement, PFM and institutional systems within the public sector to support the provincial and local governments during reconstruction. Of the total amount, nearly PKR 1.1 billion is required for restoring and, where needed, augmenting state capacities to deal with the post-disaster situation.

Environment

71. ***(a) Damage - PKR 992 million (US$ 11.67 million):*** The floods have resulted in environmental damage, heightened environmental health risks and have affected forests, wetlands and other natural systems. There has been significant damage to trees and forest land, avenue and block plantation, forest nurseries, mangroves, wetlands, wildlife resources, and Forest Department infrastructure. The floods have also caused contamination of drinking water, proliferation of disease vectors caused by stagnant water ponds, and accumulation of solid waste - factors that will further exacerbate health risks for the affected population, particularly women and children. No estimates are available for damage to other environmental resources such as wetlands, mangroves, and cultural heritage sites at this stage.

72. ***b) Recovery/reconstruction needs - PKR 17.7 billion (US$ 209 million)*** The includes the costs for restoring critical forests, riparian vegetation, mangroves and wetlands; costs for reversing the nega-

tive impact of the floods on the environmental health; and costs for institutional strengthening, planning, and capacity building to reduce the risk as well as impact of future floods.

F. GUIDING PRINCIPLES OF THE NEEDS ASSESSMENT AND RECOVERY STRATEGY

73. The experience of implementing the reconstruction program following the devastating 2005 earthquake in Pakistan holds important lessons on how to implement a large-scale reconstruction program. Experiences of recent large-scale post-disaster reconstruction programs in other countries also offer several relevant lessons. Though the institutional arrangements for implementation of reconstruction programs inevitably vary across countries, a **core set of guiding principle**s has emerged from these experiences which should be considered for the post-2010 flood reconstruction program. The following principles are the most relevant:

74. ***Coordinate centrally, implement locally. -*** Central coordination with local implementation should be one of the key features of the institutional framework to implement the reconstruction program. The majority of successful large-scale reconstruction programs have carried out central coordination through a Nodal Agency. In past reconstruction programs this has been considered critical for setting overall policies, strategies and standards, especially in areas such as cash transfers, asset compensation, and housing entitlements. In addition, a centrally coordinated mechanism is essential for effective coordination between government agencies as well as engagement with international donors. In cases where many international NGOs are implementing programs a central agency can ensure their efforts are consistent, coordinated and targeted to meet needs and gaps in the program. It will allow the Government to set common standards for all involved including the donor agencies. A central agency can also play a key role in helping to troubleshoot and overcome obstacles in the reconstruction program and maintain a sense of urgency.

75. Within the broader context of central ***coordination***, reconstruction should preferably be implemented at the lowest competent tier of government to ensure that it is tailored to the local conditions. This also encourages more rapid feedback loops from local communities to implementing agencies. Through this "subsidiarity" principle, local ownership is strengthened and sustainability of reconstructed assets is better ensured.

76. ***Focus on poverty reduction and sustainable livelihoods. -*** Ensure that the rehabilitation and reconstruction efforts are socially equitable with support targeted mainly to those in greatest need. Special measures should be put in place to ensure that vulnerable groups living in the flood affected areas, such as landless farmers, tenants, and those in riverine areas where property rights are poorly defined, fully benefit from the support measures to be provided, through targeted outreach and monitoring.

77. ***Support Government Institutions. -*** Prior to the 2010 flood event, most government institutions were already struggling to fulfill their mandated responsibilities. Many government institutions will therefore need support, in the form of additional capacity or specific expertise, to implement their part of the reconstruction program. Support is also needed to deal with the increased demand for interaction with local communities and for public information. This support can be provided by mobilizing and redistributing expertise with the government or it can be provided in the form of technical assistance from international and private sector partners.

78. ***Match greater flexibility and speed in Public Financial Management and Accountability (PFMA)***

processes. - The urgency of the reconstruction program calls for fast-track operations with streamlined, flexible procedures and systems while increasing controls to address equally important concerns on anticorruption, transparency and accountability. Although core fiduciary principles need to be applied, management, planning, budgeting and project implementation need to follow a different sequence and modalities to be effective, especially in the early phase of reconstruction implementation.

79. The influx of additional resources from multiple donors will require additional controls, not only to meet enhanced stakeholder expectations but also to compensate for the additional strain on the PFMA systems. This can best be achieved through independent oversight bodies, comprehensive M&E systems, enhanced audit procedures, specialized complaints and grievance redressal mechanisms, and effective anti-corruption penalties. To balance speed and accountability, some services such as procurement, accounting and auditing could be outsourced. This would also address capacity constraints of the government institutions.

80. Many large-scale reconstruction programs have expedited ex-ante audit processes in favor of emphasis on ex-post audit. This approach has been shown to increase the speed at which reconstruction can be delivered.

81. ***Channel funds into the hands of those with the strongest incentives to use them for the intended purposes. -*** In post-disaster contexts, this has generally translated into a strong preference, where appropriate, for Community-Driven Development (CDD) implementation arrangements and transfer programs directly to beneficiaries. Such arrangements not only help to disburse benefits to communities and individuals quickly, but also make best use of individual ***incentives*** to ensure that funds are used for their intended purpose. However, support mechanisms, preferably in collaboration with civil society organizations, may be required to make this approach fully effective. Such support could focus on ensuring equitable distribution of assistance at community level, integration of gender considerations in community decision-making, and adherence to proper standards and processes.

82. ***Communicate, consult and manage expectations. -*** Continuous communication and consultation with all stakeholders is essential for identifying needs and managing expectations. Dedicated mechanisms need to be put in place for beneficiary feedback and ***grievance redress***. Regular consultations with the donor community will assist in addressing donor concerns, channeling resources to address gaps, highlighting common issues and lessons, and seeking solutions to problems. Regular communication with beneficiaries and donors is essential to manage expectations and to maintain popular support.

83. ***Maximize credibility through an independent oversight board, third party monitoring and a grievance redressal mechanism. -*** An independent oversight board representing the interests of stakeholders is one of the most effective ways to ensure ***accountability*** and transparency over reconstruction implementation. Independent systems for third party monitoring, where possible in collaboration with civil society, will further enhance credibility.

84. Considering the scale of its program, a dedicated grievance redressal system is needed that complements the existing mechanisms. Such a system would need to be operationalized at local (union, *tehsil* or at least district) level. Cases that cannot be resolved through this mechanism can then be referred to the existing systems such as the Ombudsman or to the courts. To overcome the difficulties in accessing and resolving issues through these systems, in particular for vulnerable people, legal aid centers may need to be established.

85. ***Institutionalize urgency in Government and donor institutions. -*** A constant theme spanning across the principles laid out above is the need for speed, flexibility, pro-activism, responsiveness and openness. Maintaining the sense of urgency during the entire frame of reconstruction implementation will be a challenge. Over time, the sense of urgency will tend to wane with the risk that a business-as-usual attitude will take over. Hence the challenge of the recovery is to institutionalize urgency, i.e. to embed the drive for extraordinary results into government and donor systems and practices. Setting a clear time frame during which the institutional framework for reconstruction and its associated implementation arrangements and fast-track procedures will be applied is important in this context, not only for the Government but also the donors.

G. GOVERNANCE AND INSTITUTIONAL CONSIDERATIONS

86. The magnitude of the reconstruction program, its urgency, its geographic scope and the multitude of stakeholders at federal and provincial/ regional levels, pose an unprecedented challenge. The recent shifts in governance resulting from the 18th Constitutional Amendment, the weak PFM capabilities, human resources constraints, and complex intergovernmental coordination mechanisms add to this challenge. At the same time, concerns about accountability and transparency on the part of the public and the Government's development partners need addressing. A "business-as-usual" implementation framework for the reconstruction program may take six to ten years to complete reconstruction, clearly unacceptable for the millions of affected people.

Institutional Framework

87. An institutional framework, ensuring efficient and transparent delivery of the reconstruction portfolio, is needed to establish government ***commitment*** to the reconstruction process and credibility for mobilizing resources. The following key guiding principles should be considered while firming up the institutional framework:

88. ***Coordination and clarity of mandates -*** In view of existing capacity gaps, the additional stress and workload created by the floods, and the multi-sector nature of the reconstruction program, dedicated nodal agencies may need to be established at the federal and provincial/regional levels. The mandates of the various levels of government have to be in line with the 18th Amendment. A lead role is required by the federal government in overall coordination, monitoring and formulation of reconstruction policies and strategies, necessary for equity considerations. The provincial and regional governments should lead the implementation of the reconstruction program including coordination, policy, planning and monitoring at the provincial and lower levels. Effective coordination would also be required at sectoral level to facilitate information sharing, better planning and collaboration among the multiple partners.

89. ***Early articulation of policies, strategy and standards -*** given the urgency of reconstruction, provincial and regional governments have already started articulating their responses. The federal government needs to ensure that reconstruction policies and ***strategies*** are articulated as soon as possible to avoid inconsistencies and major divergence in reconstruction implementation. Allocation of resources among provinces/regions has to be based on the needs and the associated disaster risks for reconstruction.

90. ***Setting a definite time frame for reconstruction implementation -*** Planning has been weak in all the previous disasters in Pakistan. A definite time frame for reconstruction implementation is needed to install an emergency mindset among the government institutions and reconstruction partners. The

plan should be based on existing private and public sector capacities and systems efficiency to implement reconstruction and should also include measures to address the gaps in these capacities and systems.

91. ***Enhanced transparency*** **-** Independent oversight and monitoring involving representatives of civil society is essential to achieve transparency. To achieve this the Government has established an oversight council comprising of independent and reputable individuals from civil society. The National Oversight Disaster Management Council (NODMC) will review progress, outcomes of the reconstruction M&E and audit reports. Enhanced disclosure about reconstruction policies, strategies, criteria, procurement and plans to the Pakistani and international community is required through proactive reporting and effective communications systems.

92. ***Subsidiarity and existing government institutions*** **-** The implementation arrangements need to respect the mandate of existing institutions and strengthen them by addressing capacity gaps and overlaps. Setting up parallel structures should be avoided to the extent possible and reconstruction implementation responsibility may be delegated to the lowest level of government, to increase accountability and outreach of the reconstruction.

93. ***Enhanced Accountability*** **-** Reconstruction requires enhanced fiduciary safeguards and risk mitigation measures, including internal controls and external audits. The existing public sector financial management systems (PIFRA)[24] may need to be augmented by robust integrated FMIS to track reconstruction/donors funding. Additional internal control/audit capacity may be required at the district or regional (division) levels to strengthen internal controls in the affected areas. All reconstruction programs and projects channeled through the budget systems may be audited by a dedicated unit the Auditor General (AG) of Pakistan as the external auditor in conformity with the International Standards of Auditing. Outsourcing or additional capacities in the AG office may be considered for performance audits and efficient provision of annual audit reports.

94. ***Institutionalizing fast-tracking*** **-** Fast-track procedures are required for disbursements, procurement and approvals of the reconstruction program. In many cases procedures exist but are rarely used due to reluctance on the part of agencies unfamiliar with these procedures. Technical back-stopping to develop capacities of implementation agencies in their use, and further elaboration and simplification of procedures may be required.. The fast-track procedures need to be accompanied by clear systems, controls and instructions to minimize corruption and ensure accountability. Similarly incentives systems to facilitate the return of government staff to the flood affected areas have to be put in place; these should be designed to attract and retain quality staff working under difficult conditions.

95. ***Use private sector and community capabilities*** **-** The additional capacities required in the short- to medium-term for reconstruction could be outsourced so that government institutions can continue to perform their normal operations. The outsourcing could benefit from innovative options like turn-key (design-build) and public-private partnership models. Similarly community participation may be promoted and facilitated in community and village level infrastructure. Partnerships could include individual households in the case of housing and similar programs.

96. ***Safeguards in reconstruction*** **-** While reconstruction requires accelerated implementation, social and environmental safeguards need to be maintained. Social and environmental review and approval procedures need to be adjusted and additional capacities developed/acquired to review and implement

[24] Project to improve Financial Reporting and Auditing

and monitor the safeguard plans. The additional burden posed by reconstruction activities will further weaken the already stressed legal system. Timely and effective response to grievances and complaints both at individual and institutional levels (relating to delays, procurement, etc.) need to be ensured through the establishment of effective grievance redressal systems and complaints handling procedures, to avoid delays and protect individual rights.

Outline Institutional Structure

97. Based on the guiding principles **and** taking into account the mandates of the various institutions involved, a possible outline institutional structure to be considered for flood reconstruction, is provided in the Annex five.

98. The Council of Common Interest (CCI) will provide policy guidance to the federal and provincial/regional governments. The CCI will ensure the equitable allocation of reconstruction resources, and resolve interprovincial issues on reconstruction policy and implementation. The NODMC will provide the independent oversight and report its findings to the CCI, parliament, partners and the public at large.

99. ***At Federal level:*** The approval bodies at federal, provincial and district level will continue to approve projects according to their existing mandates. As a large number of programs are expected in the initial phase, additional dedicated **capacity** may need to be established to fast-track the review process. A member from the National Disaster Management Authority may be co-opted in existing bodies to ensure incorporation of disaster risk reduction (DDR) considerations in the design of the reconstruction programs, where appropriate. The Government may also raise the approval authority of provincial/regional governments, including simplification of the PC-I format and umbrella approvals for reconstruction programs to fast-track approvals. The Ministry of Finance (MoF)'s External Affairs Division will be responsible for negotiating and concluding grant and loan agreements for reconstruction programs with the external on-budget partners.

100. The Nodal Agency at federal level will be responsible for the coordination of off-budget RR program and the on-budget programs. This Agency will be the first point of contact for all external partners and act as the Secretariat for the Government - Donor Coordination Group. The Agency will establish a database of reconstruction programs to ensure synergies and equitable allocation of resources. The Agency as Secretariat of NODMC will monitor the reconstruction implementation (on and off-budget) and provide reports to the CCI, the NODMC, the Government's reconstruction partners and the public at large. The Nodal Agency will also assist in the formulation of reconstruction policies, strategies and standards.

101. The Auditor General will be responsible for the audit of all on-budget programs in conformity with the International Standards of Auditing. All other federal agencies will be responsible for the implementation of reconstruction programs that fall under their respective mandates. These agencies include, among others, the National Highway Authority (NHA) and the Water and Power Development Authority (WAPDA).

102. ***Provincial/ Regional Level:*** The provincial and regional governments will lead reconstruction implementation based on the federal government's reconstruction policies and strategies. Each provincial/ regional government may require a Reconstruction Committee/**Commission** for guidance and oversight of reconstruction programs. The Committee may include: (i) the Chief Minister (Chair), (ii) an opposition Member of the Provincial Assembly, and (iii) the Secretaries of the departments involved in reconstruction implementation.

103. The Planning and Development Department (PDD) will be the nodal agency responsible for coordination of reconstruction implementation at provincial/regional level, including any Government-Donor coordination. It will also ensure compliance with reconstruction policies and strategies across the various sectors. The PDD will establish a dedicated Reconstruction Unit that will be the focal point for reconstruction planning, clearing reconstruction projects, coordination, and M&E.

104. Line Departments will be **responsible** for the preparation and implementation of reconstruction projects in their respective sectors. Line Departments with a large reconstruction program may need to establish a dedicated reconstruction unit or outsource. District Offices will be involved in the coordination, implementation and monitoring of small-scale local level reconstruction programs. They will also facilitate the implementation of off-budget reconstruction programs and establish a district-level coordination forum for this purpose.

Monitoring & Evaluation (M&E) System

105. The demand for urgency and transparency in the flood response requires an effective M&E system in place at the outset. **Monitoring** is challenged by dispersed implementation across a range of sectors and the information needs of multiple partners, donors, decision makers, the general public, affected population and implementation agencies.

106. The Project Monitoring & Evaluation System (PMES) currently used by the federal Planning Commission only captures the federally funded Public Sector Development Program (PSDP) - its basic point of reference is the PC-1 and annual plans. It is mainly used to monitor physical progress and fund allocation and use. It does not currently offer any connectivity to the provincial PSDP or donor funding. PMES is a web-based program for which access is being slowly extended to all federal line ministries. The provincial M&E systems independent of the PMES also use PC-1 as a point of reference in their design, however the quality, extent and operation of these systems varies substantially between provinces. Almost all these systems are outside the public domain, and are not designed to capture any activity outside the PC-I. No qualitative data is being captured by these systems although some pilot work is ongoing under PMES. The only M&E system that has extended its boundaries to include multiple sources of funding, diverse information needs of multiple stakeholders and provides information to the general public has been designed by the Government of Punjab (GoPb).

107. ***M&E System for the Flood Reconstruction:*** The reconstruction activities have special M&E needs that are not necessarily aligned with PMES. The reconstruction programs are expected to be financed both on- and off-budget, by multiple sources of funds provided by multiple donors. There are reconstruction programs that are not PC-I based such as housing and cash grants, and many others where in-kind support is being extended such as agriculture and livestock. In addition an M&E system supported by an MIS in reconstruction should provide information to coordinate the reconstruction activities between multiple agencies and also provides management information for efficient decision making. Similarly reconstruction information and reporting needs have to be efficient to facilitate delivery in short time frames; this can only be done with multiple access and control of the systems.

108. It is important that reconstruction requirements do not undermine but supplement and strengthen existing M&E systems, without overloading them with activities that may not go beyond the reconstruction phase. Based on these considerations the Government may consider a two-pronged strategy for M&E: a) strengthening PMES, by consolidating existing requirements and adding modules that are common to reconstruction and future needs of the system; and b) developing an M&E/MIS capturing the reconstruction requirements not served by existing and future needs of the PMES, with

a well-developed interface in case of future disasters.

109. The model developed by Punjab serves as a very good starting point but this will have to be reviewed in the context of the multiplicity of requirements in sectors/themes and players whose information needs have to be met. All provinces and regions may not have the same technical capacity, so the system's design and its use have to take account of these limitations. The recommended approach is to start with a basic system immediately and built incrementally once it starts operating.

110. The annex five shows the monitoring responsibilities at different levels. The M&E system for reconstruction may be developed by the federal Nodal Agency. Implementation would take place at different levels, for which additional capacities and training would have to be provided at the relevant levels of the provinces, districts and off-budget donors to operate such a system.

H. SOCIAL ASPECTS

111. The majority of the flood affected population has lost their livelihoods. Both poor and non-poor households were affected; however, it is the vulnerable households that will suffer the most. Dislocation means that existing systems of social support and self-help groups break down. The flood has highlighted the plight of the poor, marginalized and vulnerable in Pakistan and has also worsened the problems of the estimated 2.5 million affected by the security situation in KP and FATA. The scale of human suffering from the disaster is unprecedented and presents an enormous development challenge for Pakistan. While the degree of severity varies by region, there is no doubt the country is experiencing a severe humanitarian crisis. The UN has identified 12.4 million people in need of immediate assistance. Pakistan is already struggling from low social development indicators, ranked 141 out of 182 countries in the Human Development Index (HDI) with a Gender Development Index (GDI) ranking of 124 out of 155 countries and 22.3 percent of the population below the poverty line. The burden of undernourishment is high, with a prevalence rate of 23 percent; almost 40 percent of children are underweight and the literacy rate for over 10 years is only 57 percent.

112. ***Gender:*** Women have mainly reproductive and domestic roles in the household and are barely visible in the public spheres, particularly in rural areas. The Preliminary Gender Needs Assessment report by UNIFEM reports that women may become unnoticed in the compensation process as their economic contribution is usually invisible.[25] Land rights which are challenging for poor men, are even more challenging for women who are usually denied inheritance and property rights. The devastation caused by the floods destroyed their limited assets, worsened their personal security situation, and changed their responsibilities as they are forced to respond to emergency conditions. While women's health is vital to the well-being of their families, after disasters, traditionally as caregivers, they tend to place their needs last. In certain provinces, cultural norms such as 'purdah' limit women from being able to articulate their needs, even though the floods forced women into camps and the public space. Access of women to health care, ante-natal services in the camps, involvement of women in house reconstruction, and resilience of women as evidenced in the media and other reports, have brought yet to be identified changes in the perceived and believed roles and relations on the gender front.

113. In periods following disasters, women's medical, hygiene, and nutrition needs are frequently neglected; girls' education is not prioritized. In the absence of recognition of women-headed households and virtual invisibility of the economic contribution of women, livelihoods for women are not a priority.

[25] UNIFEM, Rapid Gender Assessment, 2010

In this setting, there is an increasing risk of women and girls being traded as commodities. If not properly addressed, this disaster could lead to increasing maternal and child mortality, decreasing literacy rates, increasing gender-based violence, as well as decreasing economic autonomy. These factors could significantly worsen pre-existing gender inequalities, and increase women's invisibility in the political and economic spheres. In certain circumstances, women may require dedicated services. Asset creation such as land distribution, restoration of previous and creation of new opportunities for livelihoods are measures to avoid further marginalization of women and ensure their equitable access to reconstruction support. For this reason a gender mainstreaming framework (see Annex four) was prepared to inform the reconstruction process with recommendations on how women should be involved in the post-disaster phase and how specific needs of female and male flood victims should be addressed.

114. ***Vulnerable Groups and Vulnerability Mitigation:*** Catastrophic events that impact on basic human needs disproportionately affect the most vulnerable groups - children, minority groups, the elderly, landless tenants, people with special needs, population that is food insecure;, and women. Existing vulnerabilities are exacerbated, and new vulnerabilities emerge as some who were previously economically secure are now unable to meet their daily needs. It is essential that the Government adopts a rights-based development approach to reconstruction.

115. Some 3.5 million children[26] are affected by the flood which has destabilized the educational system, both in the affected districts where schools have been lost, and in the districts where camps have been set up in public schools. The lack of livelihood opportunities for parents and the temporary closure of schools increase the risk of an increase in child labor, forced/child marriages, and human trafficking. As well as widows and single women-headed households, women never married are another vulnerable group as their opportunities for social mobility and for employment outside the house are limited. Those in *katcha* areas and remote locations risk being excluded from reconstruction efforts, as do ethnic and religious minorities, Afghan refugees and IDPs from conflict-affected areas. The challenge lies in looking beyond relief, beyond restoration to improving lives and offering opportunities. Failure to redress existing structural inequalities means many risk falling into chronic deprivation and will not have an opportunity to lead a dignified life; which may lead to further social tensions, religious extremism and civil unrest.

116. In the context of reconstruction programs, social protection strategies should help the affected populations and, in particular, the poor and very poor households cope with the immediate after-effects of the disaster (in this case the 2010 floods); and, in the medium- to longer-term[27] , build systems that mitigate the effects of future shocks.[28] The strategies combine early impact on vulnerable groups, and they have the potential to reduce the likelihood of widespread and persistent deprivation. Key entry points are as follows (details are provided in the annex on social protection and livelihoods):
    - *Temporary employment replacement;*
    - *Relief in cash or in kind;*
    - *Enhancing disaster recovery preparedness;*
    - *Rebuilding livelihoods;*
    - *Introduction of conditional cash transfers (CCT) to serve as a springboard for restoring use of health services and school attendance;*
    - *Adopting a common targeting instrument* for data consistency and use in times of emergency -

[26] As of UNOCHA updates (6th September 2010). According to the census figures of 1998, children aged 0-14 years is 42.4 (20.3% girls and 22.1% boys) and 15-29 years is 26.7 % (13.1% women and 13.6% men). The child-dependency ratio is 61.7, the highest in the South Asia.
[27] The "immediate" future, or the short term, implies a six- to eight-month period following the introduction of short-term initiatives; the medium to longer term cover a roughly 30-month period.
[28] Mitigating activities reduce the effects of a future risk or shock. Coping strategies help the population deal with the after-effects of the shock.

BISP offers a good platform to link safety net initiatives;

- *Involving women actively in the reconstruction* process and establishing grievance redressal mechanisms, which are equally accessible for women.

117. Reconstruction programs should be designed once social and vulnerability assessments, including gender assessments, are completed for each sector. Targeted support is necessary for groups who were unable to meet their basic human needs or were unseen pre-flood but whose lives have become that much worse post flood. While each sector annex deals with specific recommendations, opportunities exist to provide, for example, titles to land when reconstructing houses for the landless, distribute land among the landless including women when restoring livelihoods, regularize informal settlements and provide basic civic infrastructure, when reconstructing records including land records, establish computerized and transparent recording systems.

118. ***Social Safeguards: Do No Further Harm, Respect due process of law and establish an effective grievance redressal mechanism:*** Reconstruction efforts to restore services and essential infrastructure may require involuntary land acquisition. If further harm to people is to be avoided, hasty decisions to involuntarily clear settlements in the flood path and from *katcha* areas must be avoided. Decisions should be based on considered, consultative and empathetic planning. Regional and international policies and law precedents are available. During reconstruction, effective safeguard measures and implementation mechanisms need to be put in place to ensure people are promptly compensated, provided support for livelihood development along with appropriate and effective grievance redressal mechanisms at the local level. Transparent mechanisms for determining compensation, supported by effective and extensive public information campaigns are critical. Recreation of lost records including land records should be computerized with mechanisms for transparency and third party validation built in.

I. ENVIRONMENTAL ASPECTS

Environmental and Social Safeguards

119. The floods have caused wide-ranging damage to different sectors of the national economy. The reconstruction and recovery needs are diverse and multi-faceted as elaborated in this DNA, and work has to be undertaken on an urgent basis. However, these reconstruction and recovery interventions, particularly those related to irrigation and water resources, agriculture, transport, health, education, housing, and WATSAN are likely to cause negative environmental and social impacts. In order to ensure the sustainability of the reconstruction and recovery process, redressal of these negative environmental and social impacts has to be made an integral part of all sectoral plans.

120. The national environmental legislation (PEPA 1997), as well as the International Financial Institutions' (IFIs) safeguards require that environmental and social assessments are carried out and management plans/frameworks are prepared prior to undertaking the interventions such as those recommended in the floods DNA. However, details of the specific activities associated with the individual reconstruction and recovery plans in the majority of sectors are not currently known, hence the potentially adverse environmental and social impacts of these activities cannot be identified. Instead, it is proposed that a broad Environmental and Social Screening and Assessment Framework (ESSAF) be prepared for the overall reconstruction and recovery needs.

121. The ESSAF will define the environmental and social screening and assessment requirements of individual projects or interventions, and will guide the implementing agencies in identifying the appro-

priate type and level of environmental and social assessment to be carried out prior to undertaking each project or intervention - in compliance with national as well as IFIs' safeguard requirements. The ESSAF will also define the requirements for preparing appropriate environmental and social documents, and obtaining approvals/clearances of these documents from the relevant agencies.

122. To ensure implementation of ESSAF, it is further proposed that each line agency appoints an environmental and social focal person within the department.

J. DISASTER RISK MANAGEMENT AND CLIMATE CHANGE

Pakistan Disaster Risk Profile and the Current Flood Event

123. Pakistan is at risk of various types of natural disasters of which cyclones, flooding, landslides, earthquakes and drought are the most common. The floods of 1950, 1988, 1992 and 1998 resulted in a large number of deaths and severe loss of property, while the July 2010 floods have been described as the worst in the last eighty years and led to nearly 20 million people being significantly affected with an estimated over 1,800 deaths[29] . The country's seismic risk vulnerability was proven in October 2005 when a major earthquake measuring 7.6 on the Richter scale hit nine districts in Khyber Pakhtunkhwa (KP, formerly NWFP) and Azad Jammu and Kashmir (AJK), killing over 73,000 people and damaging/destroying about 450,000 houses. The droughts of 2000-2002 and fourteen cyclones recorded in the period of 1971-2001 caused a significant amount of damage.

Key Lessons Learnt from Flood Response 2010

124. Lessons learnt include: (a) The exceptional intensity and prolonged period of the rains and consequent flooding clearly overwhelmed national, provincial and local disaster/flood management capacities, particularly at the district level; (b) the partial implementation of already prepared national response and contingency plans, limitations of existing early warning arrangements down to community level effects disaster preparedness, emergency response mechanisms and structural mitigation; and (c) the affected communities lacked disaster preparedness awareness, sensitization and education regarding localized hazard and flood risk reduction, emergency preparedness and response functions - particularly required for populations located within flood plains.

Climate Change and Flood Linkages

125. Climate change is being considered as a critical factor behind changing rainfall patterns and the visible increase in precipitation during monsoon seasons in parts of the country. Research work based on long-term climate change data points towards a scenario of future occurrence of heavy rainfall events during monsoon seasons over north-west Pakistan instead of north-east. As a result, areas along the western rivers of the country (Indus and Kabul) will be more vulnerable to flood episodes similar to the one experienced during the current season.

Institutional Structure, Legal and Policy Framework for Disaster Management

126. ***System evolution and description.,*** In common with many other countries, Pakistan had a disaster-response strategy predominantly centered on "Emergency Response Paradigm". The post-2005 earthquake promulgation of the National Disaster Management Ordinance 2006 and the National Disaster Risk Management Framework are reflective of the initial steps by the country to move towards a pre-emptive and pro-active approach towards disaster management. Under the Ordinance, the National Disaster Management Authority (NDMA) is now the lead agency at federal level for dealing with disasters. The National Disaster Management Commission (NDMC) has been established as the policy-

[29] NDMA Situation Report October 19, 2010.

making institution on DRM, while NDMA serves as its executive arm. NDMC functions under the leadership of the Prime Minister as a multi-sectoral platform encompassing all relevant stakeholders in the public and private sectors and civil society. At the decentralized level are the Provincial Disaster Management Authorities (PDMAs) and District Disaster Management Authorities (DDMAs). PDMAs have been established in Punjab, Sindh, Baluchistan, KP, as well as Gilgit-Baltistan, however the establishment of DDMAs could not be completed. DDMAs have been notified in some districts but have limited capacity.

127. ***National Disaster Risk Management Framework (NDRMF).*** The NDRMF serves as a policy document to provide strategic guidance for DRM activities in the country. It also highlights nine priorities for action over a five-year period including institutional and legal framework, hazard and vulnerability assessment, training, education and awareness raising, DRM planning, community level risk reduction, establishment of multi-hazard early warning system and emergency response system, mainstreaming DRR into development, and capacity development for post-disaster recovery.

128. ***Flood Management.*** The Federal Flood Commission (FFC) is the main agency responsible for flood control in the country. The agency is mandated to ensure coordination and management of floods and flood protection works in an integrated manner. FFC is also responsible for formulating a National Flood Protection Plan including structural and non-structural elements, and ensuring its implementation through the provinces. However, WAPDA and PMD also have important roles to play in terms of flood management in the country including flood forecasting and early warning.

129. ***Climate Change.*** The Ministry of Environment (MOE) is the coordinator, manager and custodian of work on climate change. The MOE is developing a climate change policy and plan of action which are based on the recommendations of the Task Force on Climate Change. The Global Change Impact Study Center (GCISC), a technical institution partnering with the MOE, is responsible for scientific work in climatology and assessing the impact of climate change on agriculture and water resources.

130. ***Evolution of and relationship between flood management and DRM institutional/functional structures.*** As indicated above there have been multiple institutions involved in flood management and their inter-relationships, as well as interaction and coordination mechanism with DRM structures, are ambiguous. If other structures are taken into consideration, such as the armed forces, civil defense and emergency relief structure, coupled with multiple laws such as NDMO, National Calamities Act, etc. the situation becomes even more complex. Response agencies often have different reporting lines both at federal and provincial levels and overlapping roles and responsibilities. Although the NDRMF attempts to define roles and responsibilities, it is just a framework and, in the end, actual reporting lines and controlling ministries and departments determine the tasking of response agencies. It is, therefore, critical that all response agencies have distinct roles and, where possible, assimilation takes place.

DRM Strategy and Recommendations

131. ***Policy and institutional.*** The NDMO (2006) lays the foundation for the establishment of new DRM structures at all tiers within the country. However to further enhance the effectiveness of these structures certain measures will need to be taken including improvement of communication and coordination between DRM structures, and establishment of linkages to existing frameworks on climate change.

132. ***Risk identification.*** It is important to identify the overall national risk environment through collation of existing information, identification of gaps and additional mapping exercises. While conducting

multi-hazard mapping activities, the Government should ensure that a common platform is utilized so that all information can easily be integrated.

133. ***Mitigation Measures.*** These measures include assessment and improvement in existing multi-hazard early warning systems including for floods and improved downstream linkages to communities. Communities also need to be trained and made better aware of disaster response and their role as first responders.

134. ***Capacity building, knowledge management and education.*** Within the framework of developing integrated (interdisciplinary) approaches to flood risk management, relevant research, training, education and capacity building need to be undertaken. These include provision of training courses for government officials and NGOs on flood risk management and relevant new technologies, as well as technical experts and strengthening of integrated flood risk management education, the curricula of Pakistani tertiary educational institutions, and partnerships with international universities and institutions.

135. ***Risk transfer and sharing.*** The Government of Pakistan is usually unable to absorb the losses arising from disasters and mainly relies on ex-post donor funds to meet expenditures. Such an ex-post risk financing strategy has proved to be insufficient, leaving an ex-post resource gap. Therefore the Government needs to consider development of a country catastrophe risk financing strategy which could rely on reserves to finance frequent but not severe hazards, contingent credit facilities to finance the mezzanine layer of risk and (parametric) insurance and/or catastrophe bonds to finance the upper layer of risk. The strategy would also need to envisage steps towards development of a catastrophe insurance market.

136. ***Emergency preparedness for effective response and recovery.*** Emergency preparedness and response is essential for a successful flood risk management strategy since, despite all flood control measures, there will always be a 'residual' risk that a disaster might happen. In order to deal with this risk there is a need to encourage planning, simulation drills, and community participation in early warning, disaster response and recovery as well as to develop capacity, methodology, and institutional systems for carrying out assessments such as multi-hazard risk assessments and damage and needs assessments.

137. ***Climate change adaptation.*** Climate variability produces extreme events such as floods, cyclones and drought. It is likely that climate change is accelerating climate variability and bringing about such unusual changes. Moreover, it is widely felt that climate change adaptation is the right solution to climate change which only has limited mitigation options. The Government should consider prioritizing recommended actions in the National Task Force Report and using these as a basis to formulate a national climate change action plan with costing and timelines. There is also a need to strengthen the technical capacity in the MOE to deal with climate change issues and increase support for national climate change research centers with increased regional/global cooperation among climate change bodies/organizations.

138. Annex 2 provides the detailed breakdown of costing needs for the DRM sector, estimated to be PKR 2.2 billion.

ANNEX-1: ECONOMIC ASSESSMENT

Rune Stroem

Background

1. The floods are expected to have a substantial adverse impact on the economy. As the effect on various macroeconomic parameters would essentially depend on the policy that the government will adopt in the post flood scenario, it would be difficult at this juncture to provide any quantitative assessment of the impact of floods on the economy. The government is faced with a set of macroeconomic trade-offs and has to choose an optimal policy that will mitigate the impact of floods in the shortest period of time, while protecting the long-run objectives of sustainable economic stability and growth. For example, a policy supporting an accelerated recovery of flood affected areas can reduce both the growth and social impact of floods, but may significantly worsen the already fragile fiscal situation. Similarly, a policy of lowering the impact on the industrial sector through imports (of cotton and sugarcane), will adversely affect the trade balance. The directional impact of floods on the economy can be assessed, however.

Pre-floods economic scenario

2. ***Pakistan's economy has been struggling to regain stability since enduring the external and internal shocks in 2007/08.*** Even prior to the floods, there were increasing concerns about the health of the Pakistan economy. While Pakistan's external economic position has improved significantly, as the external current account deficit declined to 2 percent of GDP in 2009/10 and SBP foreign exchange reserves rebounded to US$13.1 billion at end-June 2010, and economic activity has shown some signs of acceleration, with real GDP growing by 4.1 percent in 2009/10, fiscal performance has deteriorated and is posing a threat to economic stability. The 2009/10 fiscal deficit target, which was revised upwards to 5.1 percent of GDP only in March, was missed by a wide margin-by 1.2 percent of GDP--owing to a substantial overrun in electricity subsidies and other public spending and a shortfall in tax revenues. Paucity in structural reforms caused delays in mobilizing budget support from the donors, which caused the Government to yet again resort to borrowing from the central bank to finance its substantially higher fiscal deficit. Expansionary fiscal policy and monetization of government debt has added to inflationary pressures; the year-on-year inflation has rebounded to 12-13 percent.

The economic impact of floods

3. ***In terms of their likely economic impact, the 2010 floods are the worst natural disaster in Pakistan's history.*** In magnitude, the 2010 floods have been the worst floods that Pakistan has endured in its 63 year old history. The floods have affected large parts of the country, from Gilgit-Baltistan and Azad Kashmir in the north, through Khyber Pakhtunkhwa (KP) and Punjab provinces in the center, to Sindh and Balochistan in the South. About 20 million people (i.e. more that 10 percent of population) are estimated to have been directly affected by these floods. Although, in terms of casualties, these floods were not as devastating as the earthquake of 2005, yet given the spread of the damage that they have caused to the standing crops, livestock, private houses and public infrastructure, the economic cost is likely to be substantially higher than that of the earthquake, and it would take a considerable time for the country to recover from these losses.

4. ***Overall damage is estimated at Rs 855 billion (5.8 percent of 2009/10 GDP)***, with damages in agriculture sector amounting to Rs 429 billion (over 14 percent of sectoral income). On the other hand, rupee value of damage to the housing sector is less than one-third of that in agriculture, yet comprises almost 39 percent of the sectoral value-added (see Table 1). With 44 percent of total (direct and indirect) damages, Sindh was the worst affected by floods, followed by Punjab (26 percent) and Khyber-Pakhtunkhwa (12 percent). The federal government also has a sizeable share (11 percent) share in total damages, although most of them are contributed by indirect losses of federally owned commercial banks and financial institutions.

Table 1: Province/Area-Wise Distribution of Floods Damages

(Rs Million)

	Direct	Indirect	Total		Reconstruction Cost (PKR Million)		
	Damage	Losses	(Rs mil)	(US$ mil)	Option 1	Option 2	Option 3
Agriculture	*315,547*	*113,257*	428,805	*5,045*	*21,879*	*56,925*	*89,134*
Crops	289,823	92,917	382,740	4,503	--	--	--
Livestock	27,815	20,341	48,155	567	--	--	--
Others	380	0	380	4	--	--	--
Private Sector	14,463	9,468	23,931	282	8,636	8,636	10,923
Transport & Communication	62,491	50,420	112,911	1,328	200,260	200,260	200,260
Energy	13,184	13,116	26,300	309	9,038	9,038	9,038
Banking & Finance	110	57,141	57,251	674	39,358	39,358	39,358
Housing	91,843	43,171	135,014	1,588	126,075	143,676	187,491
Irrigation & Flood Management	23,600	0	23,600	278	36,294	36,294	83,499
Education	22,047	4,418	26,464	311	42,907	42,907	42,907
Health	1,562	2,661	4,222	50	4,151	4,151	4,151
Water Supply & Sanitation	3,194	6,112	9,306	109	6,292	6,292	7,982
Governance	3,141	2,835	5,976	70	4,900	4,900	4,900
Environment	992	0	992	12	17,746	17,746	17,746
Disaster and Risk Management	0	0	0	0	2,295	2,295	2,295
Livelihood	0	0	0	0	58,076	58,076	58,076
Total	**552,173**	**302,599**	**854,771**	**10,056**	**577,908**	**630,554**	**757,761**
Percent of 2009/10 GDP	***3.8***	***2.1***	***5.8***	***5.8***	***3.9***	***4.3***	***5.2***
Memo items: Provincial-/Area-wise distribution of damages and reconstruction cost:							
Azad Jammu & Kashmir	5,411	1,891	7,303	86	13,190	13,886	16,009
Balochistan	41,988	10,689	52,676	620	27,258	34,359	58,116
FATA	4,057	2,214	6,271	74	7,595	7,873	9,544
Federal	22,860	70,257	93,117	1,095	95,911	95,911	96,866
Gilgit-Baltistan	3,648	517	4,165	49	6,627	6,893	10,027
Khyber-Pakhtunkhwa	67,643	31,982	99,625	1,172	105,957	109,942	179,844
Punjab	153,246	66,026	219,272	2,580	93,521	107,903	117,650
Sindh	253,317	119,023	372,341	4,380	227,850	253,791	269,704

5. ***The adverse impact on economic growth is likely to be substantial.*** The floods are expected to have a substantial impact on the pace of real Gross Domestic Product (GDP) growth, the rate of inflation, the size of the fiscal deficit, and the balance of payments. Before the floods, real GDP was projected to grow by 4.5 percent in 2010/11, but these projections are likely to be revised downward. As mentioned above, uncertainty about government's policy measures makes it difficult to provide a firm estimate of the impact on the macroeconomy. The following analysis, therefore, tries to assess this impact under a "passive" policy scenario, i.e. with no significant change in government policy to mitigate the effect of floods, which is the "worst case" scenario. An attempt is also made to assess the effect of flood damages in an "active" (or the likely) scenario, in which the government takes policy decisions to reduce the ill-effects of floods from the economy. In making this assessment, the government's macroeconomic targets are taken as the base, with no attempt made to validate them. Following is a tentative assessment of flood damages on income (value-added) of some key sectors:

6. Agriculture: In terms of cost, agriculture has been the most severely affected sector, accounting for a full 50 percent of the estimated cost of overall damages. With an estimated 34 percent of area under rice and 21 percent of area cotton under cotton crop damaged by flood waters, rice and cotton output may fall 2-2.5 million tons and by about 2 million bales (i.e. over 14 percent of the expected output of 14 million bales), respectively. In addition, there were significant losses to the sugarcane, fruits, vegetable and other minor crops. There are also concerns about the production of winter crops, as standing water and deposited silt hampers timely cultivation in many flood affected areas. The loss of seed

(stored by famers) can also harm the prospect of a good crop. The overall damages and losses to the sector are estimated to be around Rs 429 billion (of 14 percent of the sector value added in 2009/10), with direct damages[30] calculated at Rs 316 billion while the indirect losses[31] are estimated to be Rs 113 billion. As all of the crops affected by floods were ready for harvest, almost all of these damages can be taken as loss in sub-sectoral value added. This implies that the value added in crop agriculture, which was targeted to increase by 3.5 percent in 2010/11, is now projected to decline by about 10 percent (from the level of 2009/10), with major crops showing a decline of about 7 percent and minor crops of 20 percent. However, timely action by provincial agriculture departments, in terms of providing the seed, extension services to encourage alternative crops[32] can reduce the growth losses in the sub-sectoral value added by 0.5 percentage points.

7. Livestock sector too has suffered some heavy losses as in many areas of Khyber-Pakhtunkhwa (KP), Balochistan and Sindh flood took villages by surprise, making it impossible for farmers to save their animals. About 1.5 million animals, big and small, and about 10 million poultry birds were lost. Nonetheless, the overall direct and indirect losses[33] in livestock sector are estimated to be Rs 48 billion (i.e. only 3 percent of sub-sectoral value added). Although livestock sub-sector contributes about 50 percent of value-added in agriculture, the value-added per animal is relatively low. As such, despite the loss of large number animals, value-added in the sub-sector will decline only by 0.6 percent and the sub-sector is still expected to show a reasonable growth of 3.5 percent. On the other hand, negligible damage is done to fisheries and none to forestry sub-sectors.

8. Manufacturing: As rural areas have borne the brunt of flood devastation, the industrial sector has not been much affected by floods. Some small industrial units, largely cotton ginning and rice husking mills, were damaged. Nonetheless, the industrial sector is expected to be quite significantly affected by loss in cotton, sugarcane and other agricultural crops. The textile sector, which provides about one-third of the manufacturing sector value-added, is likely to face acute input shortages due to the loss of 2 million bales of cotton. Similarly, loss in sugarcane crop will affect the output of sugar industry which has a 5 percent share in sectoral value added. Milk, meat, fruit packaging and preparing units too are likely to face a slowdown in growth. As a result, the industrial sector, which was the targeted to grow by 5.6 percent in 2010/11, is now projected to grow by only 3 percent. Nonetheless, this reduction in growth could easily be cut by one half through timely action of the government to ensure adequate supply of cotton and sugarcane (or molasses).

9. Services: Due the impact on agricultural and industrial income, demand for output of services sector is likely to weaken, thus adversely impacting the growth of the sector. Moreover, large-scale damage to the private housing, transport infrastructure, and banking sector (through expected increase in non-performing agricultural and consumer loans), along with disruptions in economic activities in other areas, will also contribute to an overall slowdown in economic growth. These dampening impacts are likely to be partly offset by higher construction and public administration activity as rehabilitation efforts get underway. Salvaging economic growth in agriculture and manufacturing sectors through appropriate policy interventions will also have a positive effect on growth of services sector.

10. ***Inflation has already started to accelerate.*** During 2009/10, headline inflation averaged a relatively

[30] These include loss in output from damaged kharif crops, and loss of animals, seeds, food grain, farm implements, etc.
[31] These include mainly the estimated losses to the next Rabi crops, next year's kharif crops.
[32] The federal and provincial governments are presently contemplating "agricultural packages" which will provide subsidy (in cash or kind) to the farmers to ensure adequate supply of seeds, fertilizers and other implements and inputs for the next cropping cycle subsidies. In Sindh, where the fear of delayed sowing of winter crop (especially wheat crop) is the highest, the provincial government is considering encouraging sowing of sunflower crop, which can be sown in November or even December, rather than wheat, which has to be sown in October.
[33] The indirect losses mainly arise from loss in milk, meat and poultry outputs.

high 11.7 percent, but it had been expected to decelerate this year. However, at end-September 2010, the month-on-month headline inflation surged by 2.7 percent (highest increase over two years). This increase in the monthly headline inflation is driven by post-flood price increase of perishable and non-perishable food items. On month-on-month basis, prices of perishable food items increased by 14 percent in September, while that of non-perishable food items increased by 3.6 percent. Moreover, year-on-year headline inflation at end-September 2010 stood at 15.7 percent (highest increase in last 17 months) compared to 13.2 percent a month earlier. However, this may be a temporary acceleration as a result of flood damage to crops, vegetables, fruits, and livestock. Heavy government borrowing from the banking system to meets its burgeoning expenditure is likely to exacerbate the problem. To counter these inflationary trends, the State Bank of Pakistan (SBP, the central bank) is moving to mitigate price pressures, and raised the policy interest rate by 0.5 percent in July and by another 0.5 percent (to 13. 5 percent) in September.

11. ***Government's already weak fiscal position is expected to come under considerable strain*** as a large proportion of relief, rehabilitation and reconstruction cost would be borne by the government. The 2009/10 fiscal deficit was 6.3 percent of GDP (compared to a target of 5.1 percent), owing to a substantial overrun on electricity subsidies and other public spending as well as shortfalls in tax revenues. The 2010/11 government's budget targeted a fiscal deficit of 4 percent of GDP, and although this target will require substantial revenue mobilization and a surplus at the provincial level, the government seeks to meet this goal, before the impact of the floods. However, tax revenue may decline as economic activity weakens,[34] while expenditures would increase sharply due to relief, recovery and reconstruction-related efforts. This impact on the revenue could be mitigated if the Government promptly proceeds with additional tax policy and administrative measures. On the expenditure side, various measures are under consideration to mitigate the impact of floods, including cash and housing grants to households who have lost their livelihoods and homes. The estimates of overall reconstruction cost range for Rs 576 billion (3.9 percent of 2009/10 GDP) to Rs 756 billion (5.2 percent) depending on mode of reconstruction.[35] While reconstruction and rehabilitation of damaged infrastructure may be spread over 3-4 years, there would be considerable front-loading of this expenditure due to urgency on rehabilitating key infrastructure (strategic roads and bridges, railway tracks, irrigation system, schools, health centers, and power sector installations). In addition, sizeable expenditures have already been incurred on relief and rehabilitation activities. Rationalizing and reprioritizing the existing development and recurrent budgets both at the federal and provincial levels, could yield some fiscal space, but overall, the floods may add significantly to the budget deficit in 2010/11. A higher fiscal deficit would imply a larger build up of public debt, having adverse fiscal and economic implications for future. To avoid a large scale destabilization effect on the economy, the federal and provincial governments are in the process of reallocating their budgetary expenditures towards relief and rehabilitation activities. This positive step, however, would cover only a fraction of the expected fiscal cost. Pakistan would need a health injection of grant and concessional financing to avoid a medium- to long-term damage to economic stability. A careful balance needs to be established between the need for an early rehabilitation of infrastructure and ensuring economic stability. An accelerated reconstruction effort, in the absence of adequate inexpensive financing, can force the government to borrow heavily from the banking system fueling inflation and building-up the stock of more expensive debt, which can further destabilize the economy.

12. ***Private consumption may decelerate*** as a result of large-scale displacement and damage to rural liveli-

[34] In addition, declaration of many districts as calamity affected may imply that these districts would be exempted from collection many provincial and federal taxes in 2010/11.

[35] The reconstruction cost is estimated under three alternative options. Under options 1, structures are reconstructed to the same status and standard as it was prior to the floods. Option 2 reconstructs structures to higher standards so as to make them "flood resistant". Option 3 aims at reconstructing structure to make them flood and earthquake resistant (wherever they are applicable).

hoods. However, government consumption as well as public investment can be expected to increase and boost economic activity.

13. ***Balance of payments position may also weaken.*** Even before the floods, the current account deficit was projected to widen slightly in 2010/11 from the 2 percent of GDP registered in 2009/10. The disaster is expected accentuate this trend, mainly by increasing the trade deficit. Notwithstanding the positive impact of EU granting Pakistan an enhanced market access for a limited time (one year), export performance is likely to weaken, as the textile sector is impacted by the need to source some 2 million bales of cotton that may have been lost due to crop damage, and a promising new export - cement - will now have to be diverted to domestic consumption. In contrast, reconstruction and rehabilitation will require a significant increase in imports particularly of food, medicines, fuels, construction materials, and machinery. Workers' remittances are likely to continue playing an important role in financing household consumption in Pakistan. Still, substantial external finance will need to be motivated in order to sustain international reserves, which remained steady at US$12.2 billion at the end of August, 2010.

ANNEX-2: DISASTER RISK MANAGEMENT

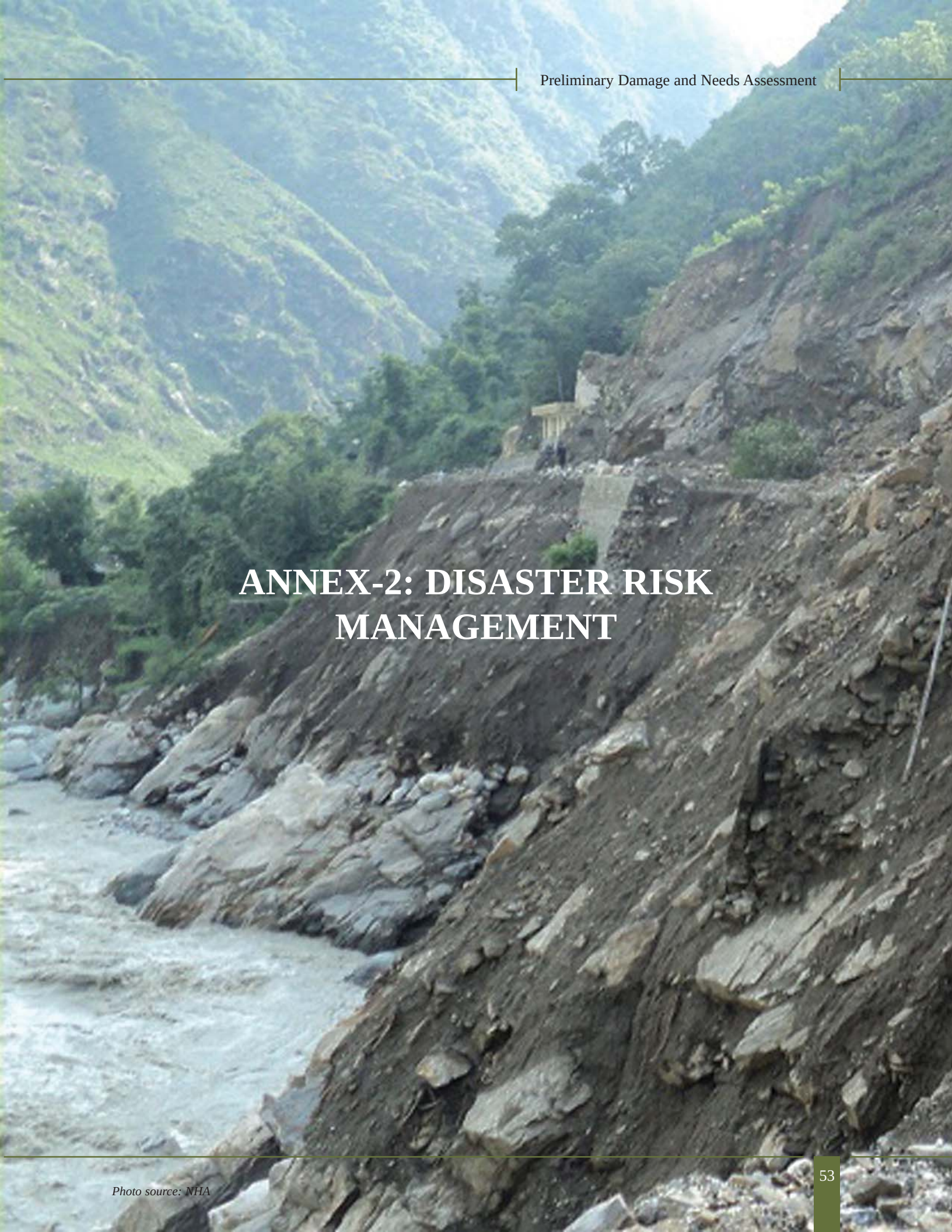


Photo source: NHA

Background

Pakistan Disaster Risk Profile and the Current Flood Event

1. Pakistan is at risk to various types of natural disasters of which cyclones, flooding, landslides, earthquakes and drought are the most common. The floods of 1950, 1988, 1992 and 1998 resulted in a large number of deaths and severe loss of property, while the country's seismic risk vulnerability was proven in October 2005 when a major earthquake measuring 7.6 on the Richter scale hit nine districts in Khyber Pakhtunkhwa (KP, formerly NWFP) and Azad Jammu Kashmir (AJK), killing over 73,000 people and damaging/destroying about 450,000 houses. Droughts are also a serious hazard in the country, especially the droughts of 2000-2002. Fourteen cyclones have also been recorded between 1971 and 2001 which caused some damage.

2. The 2010 Pakistan floods began in late July 2010 following extraordinary monsoon rains in KP, Sindh, Punjab and Balochistan regions of Pakistan, described as the worst in the last eighty years. According to the Pakistan Meteorological Department, over 200 mm (78.8 inches) of rain fell over a 24-hour period over a number of places in KP and Punjab.

Key Lessons Learnt from Flood Response 2010

- The exceptional intensity and prolonged period of the rains and consequent flooding clearly overwhelmed national, provincial and local disaster/flood management capacities, particularly at the district level.[1]
- Partial implementation of already prepared national response and contingency plans, limitations of existing early warning arrangements down to community level effects disaster preparedness, emergency response mechanisms and structural mitigation.
- Affected communities lacked disaster preparedness awareness, sensitization and education regarding localized hazard and flood risk reduction, emergency preparedness and response functions - particularly required for populations located within flood plains.

Climate Change and Flood Linkages

3. Climate change is considered a critical factor behind changing rainfall patterns and the visible increase in precipitation during monsoon seasons in parts of the country. Research work based on long-term climate change data points towards a scenario of future occurrence of heavy rainfall events during monsoon seasons over north-west Pakistan instead of north-east. As a result, areas along the western rivers of the country (Indus and Kabul) will be more vulnerable to flood episodes similar to the one experienced during the current season.

Institution Structure, Legal and Policy Framework for Disaster Management

4. ***System evolution and description.*** As in many other countries, Pakistan had a disaster-response strategy predominantly centered on "Emergency Response Paradigm". The post-2005 earthquake promulgation of the National Disaster Management Ordinance 2006 and the National Disaster Risk Management Framework are reflective of the initial steps by the country to move towards a pre-emptive and pro-active approach towards disaster management. Under the Ordinance, the National Disaster Management Authority (NDMA) is now the lead agency at federal level for dealing with disasters.[2] The National Disaster Management Commission (NDMC) has been established as the policy-making institution on DRM, while NDMA serves as its executive arm. NDMC functions under the leadership of the Prime Minister as a multi-sectoral platform encompassing all relevant stakeholders in the public, as well as the private, sector and civil society.

[1] DRM Sector Assessment also entailed field visits to Punjab and Sindh where sites were visited and detailed discussions held. Affected districts visited included Multan, Muzzfargarh, DG Khan, Sukkhur, Shikarpur, Jacobababd, Jaffarabad, Shahzadkot with meetings in Karachi with the provincial government and PDMA.
[2] NDMA is currently working under an executive order, as the NDMO 2006 is with parliament for approval (As of October 2010).

5. At the decentralized level are the Provincial Disaster Management Authorities (PDMAs)[3] and District Disaster Management Authorities (DDMAs). PDMAs have been established in Punjab, Sindh, Balochistan, KP, as well as Gilgit-Baltistan, but establishment of the District Disaster Management Authorities (DDMAs) could not be completed. DDMAs have been notified in some districts but have limited capacity.[4]

Legal and Policy Framework

6. ***National Disaster Risk Management Framework (NDRMF).*** The NDRMF serves as a policy document to provide strategic guidance for DRM activities in the country. It also highlights priorities over a five-year period. The NDRMF has identified nine priority areas for action, i.e. institutional and legal framework, hazard and vulnerability assessment, training, education and awareness-raising, DRM planning, community level risk reduction, establishment of multi-hazard early warning system and emergency response system, mainstreaming DRR into development, and capacity development for post-disaster recovery.

7. ***Flood Management.*** The Federal Flood Commission (FFC) is the main agency responsible for flood control in the country. The agency is mandated to ensure coordination and management of floods and flood protection works in an integrated manner. FFC is also responsible for formulating a National Flood Protection Plan including structural and non-structural elements and ensuring its implementation through the provinces. However, WAPDA and PMD also have important roles to play in terms of flood management in the country including flood forecasting and early warning.[5]

8. ***Climate Change.*** The Ministry of Environment (MOE) is the coordinator, manager and custodian of work on climate change. The MOE is developing a Climate Change Policy and plan of action which are based on recommendations of the Task Force on Climate Change. The Global Change Impact Study Center (GCISC), a technical institution partnering with the MOE, is responsible for scientific work in climatology and assessing the impact of climate change on agriculture and water resources.

9. ***Evolution of and relationship between flood management and DRM institutional/functional structures.*** The Water and Power Development Authority (WAPDA) was established in 1959 and was designated as the focal agency for dealing with water-related matters in the country. Flood management became a serious concern for the Government in the aftermath of the 1976 floods leading to the creation of the Federal Flood Commission (FFC) through a resolution. The agency was created with the purpose of ensuring effective coordination and management of floods, flood protection works and formulating a National Flood Protection Plan for implementation through the provinces. Provincial Irrigation and Drainage Authorities (PIDA/PID) also play a key role in flood management and implementation of flood mitigation interventions.

10. Traditionally, Pakistan has been following a response-based approach towards disaster management geared towards relief activities. The armed forces have been extensively used for this purpose and the only other organized civilian structure in this regard has been the Civil Defense Organization created under the Civil Defense Act 1952. Other legislation relating to the relief/response structure includes the Natural Calamities Act 1958 under which the appointment of the Relief Commissioners and their powers have been defined. The Civil Defense Act was substantially revised in 1994 to include activities geared towards mitigation and response including policy planning, coordination and training. An Emergency Relief Cell was also established in the Cabinet Division in 1971 for disaster relief at the

[3] However, under the 18th amendment, many subjects previously falling under the Federal Government are now the responsibility of the Provinces. There is a need to also define the roles of the Federation and the Provinces in disaster management.
[4] DDMAs are inter-departmental committees similar to District Emergency Boards functioning in Punjab prior to NDMO 2006.
[5] Details on Flood management, including recommendations, are covered in detail under the sector annex for Irrigation.

national level. In the aftermath of the 2005 Pakistan earthquake, the NDMO 2006 allowed for the establishment of the National Disaster Management Authority (NDMA) with extensions in provinces and districts.[6]

11. Despite all these developments, the major issue of how these various structures interact and coordinate with each other has remained rather problematic. Response agencies often have different reporting lines both at federal and provincial levels and overlapping roles and responsibilities. Although the National Disaster Risk Management Framework attempts to define roles and responsibilities, it is just a framework and, in the end, actual reporting lines and controlling ministries and departments determine tasking of response agencies. It is, therefore, critical that all response agencies have distinct roles and, where possible, assimilation takes place.

DRM Strategy and Recommendations

12. ***Rationale.*** During the course of the assessment the DRM Sector Assessment Team met a number of public and private sector/civil society/community-level stakeholders - a process that helped in informing policy recommendations by the team, as well as with the identification of issues in the sector which need attention and intervention. The recommendations on DRM policy and institutional development are based on an assessment of the state of current DRM structures, including a (*de facto* versus *de jure*) comparative analysis between NDMO 2006 provisions and actual practice. Secondly, the lessons learnt on disaster response and preparedness from the current flood event[7] form the basis of improvements suggested in respect of the existing disaster response and preparedness apparatus and dispensation. Thirdly, recommendations on the array of future DRM related analytical work in five key strategic areas are aimed to complement the National Disaster Risk Management Framework. They are based on a strategic portfolio review of the NDRMF with a flood focus and resultantly proportioned across these five strategic areas.

13. ***Policy and institutional.*** The NDMO 2006 lays the foundation for the establishment of new DRM structures at all tiers within the country. The following measures are recommended to enhance the effectiveness of the structure:

(a) Policy

- Key gaps in the NDMO 2006 need to be addressed through inclusion of the status of pre-existing and existing parallel structures, institutional coordination and cooperation, and funding mechanisms at all tiers.[8]
- There should be clear communication channels between technical agencies and DRM authorities to ensure prompt translation of technical recommendations into actions.
- A national climate change framework/policy should be formulated, backed by climate change legislation and its linkages to Disaster Management in the country.[9]
- Water governance policies and guidelines for management of the country's groundwater resources for emergency situations should be established.
- The National Flood Management Strategy needs to be reviewed and updated in light of the current disaster.[10]

(b) Institutional

- A management and capacity assessment/study of NDMA needs to be undertaken looking

[6] Refer to section 4.1.2, i.e., system description for details.
[7] See section "key lessons learnt" for details.
[8] NDMA has already undertaken an assessment/analysis of the NDMO 2006 and will propose changes which may be a good starting point.
[9] The National Task Force on Climate Change has recently completed a report which needs to be translated into a national policy/strategy, along with an action plan.
[10] Detailed interventions under this recommendation may be referred to in the Irrigation and Flood Management Sector annex.

at the organizational mandate and responsibilities, and the resources available, both human and financial.

- Capacities of PDMAs and DDMAs need to be enhanced, including human and financial resources. Districts may utilize the Civil Defense machinery and EDO Social Welfare for DRM-specific responsibilities.
- An improved central system for integrated data and information management is needed with linkages to provinces, down to district level.

14. ***Risk identification.*** It is important to identify the overall national risk environment through collation of existing information, identification of gaps and additional mapping exercises.[11] While conducting various mapping activities, the Government should ensure that a common platform is utilized so that all information can easily be integrated.
    - Develop and implement a National Integrated Multi-hazard Decision Support and Alert System (NIMS) with a focus on flood-related disaster management and ex-ante risk reduction.
    - Undertake flood hazard and risk mapping to identify vulnerable areas and communities at risk.[12]

15. Mitigation Measures

(a) Early Warning

- There is a need to restore and enhance the performance of key elements of the country's multi-hazard early warning systems including flood related elements.[13] Existing systems need to be integrated and new systems put in place where these do not exist for certain types of disasters in the multi-hazard context, to enable timely early warning and response.
- Downstream community linkages with multi-hazard early warning systems need to be streamlined; early warning dissemination systems to communities need to be made more efficient and effective; and a system of sustained community sensitization campaigns about early warning systems needs to be put in place at district and sub-district levels with support from Community Based Organizations (CBOs).

(b) Community

- DRM needs to be integrated as part of the curriculum for schools, awareness needs to be raised at the village level and capacity of communities built.
- Women and people with disabilities need to be empowered and integrated to be part of the reconstruction and preparedness activities.
- NGOs need to have disaster risk reduction as a mainstreaming element in all their programs, particularly those targeting communities. They should adopt community disaster risk management planning exercises including hazard vulnerability assessments.

16. ***Capacity building, knowledge management and education.*** Within the framework of developing integrated (interdisciplinary) approaches to flood risk management, relevant research, training, education and capacity building need to be undertaken. This would entail:
    - Short-, medium- and long-term training course(s) for government officials at different levels of the government, NGOs, as well as provision of technical experts on flood risk management and relevant new technologies, tools (modelling, GIS and remote-sensing applications, etc.) and institutional issues in data analysis and data fusion, and safe drilling techniques.
    - Strengthening the integrated flood risk management education and curricula of Pakistani tertiary

[11] Under the NDRMF, the need for compiling a national vulnerability atlas has been identified.
[12] The Flood Forecasting Model at PMD may be able to provide some inputs for this exercise, however a detailed scoping would need to be carried out in consultation with all stakeholders in order to have a comprehensive output
[13] Detailed costing for the flood related elements of the multi-hazard early warning systems i.e. FEWS has been covered under the Irrigation and Flood Management Sector Annex

educational institutions, and their partnerships with international universities and institutions.

17. ***Risk transfer and sharing.*** The Government of Pakistan is usually unable to absorb the losses arising from disasters and mainly relies on ex-post donor funds to meet its expenditures. Such an ex-post risk financing strategy has proved to be insufficient, leaving an ex-post resource gap. Furthermore, the lack of advance planning and resource allocation prevents funds from being immediately available after a disaster. Short-term resource gaps, due to a lack of liquidity, may severely retard economic recovery. Such a liquidity gap may have negative implications for the provision of public services, particularly if post-disaster resources are insufficient to restore existing lifeline and health services infrastructure. The following actions are, therefore, recommended:
    - ***Development of a country catastrophe risk financing strategy.***[14] Such a strategy could rely on reserves to finance frequent but not severe hazards (e.g. with a return period of five years or less), contingent credit facilities to finance the mezzanine layer of risk (e.g. events with return periods between 5 and 20 years), and (parametric) insurance and/or catastrophe bonds to finance the upper layer of risk (e.g. events with return periods higher than 20 years).
    - ***Development of a catastrophe insurance market.*** The Government should investigate the development of a private catastrophe insurance market, for example, through catastrophe insurance pools. The Insurance Department and the Security Exchange Commission of Pakistan could initiate a dialogue with the insurance industry.

18. ***Emergency preparedness for effective response and recovery.*** Emergency preparedness and response is essential for a successful flood risk management strategy since, despite all flood control measures, there always will be a 'residual' risk that a disaster might happen. Recommendations include:
    - Encouraging planning, simulation drills, and community participation in early warning, disaster response and recovery.
    - Developing capacity, methodologies, and institutional systems for carrying out assessments such as multi-hazard risk assessments and damage and needs assessments (DNA).

19. ***Climate change adaptation.*** Climate variability produces extreme events such as floods, cyclones and drought. It is likely that climate change is accelerating climate variability and bringing about such unusual changes. Moreover, it is widely felt that climate change adaptation is the right solution to climate change, which only has limited mitigation options. The Government should consider the following actions in relation to climate change:
    - Prioritizing recommended actions in the National Task Force Report and using these as a basis to formulate a national climate change action plan with costing and timelines.[15]
    - Strengthening the technical capacity in the Ministry of Environment to deal with climate change issues, increasing support for national climate change research centers and fostering increased cooperation with regional and international climate change bodies/organizations including data sharing.

Needs Estimation of Recovery and Reconstruction

20. The DRM sector assessment is a qualitative analysis of the flood event itself and the response mechanisms in the overall DRM context. The appended table is a costing exercise of the various priority actions which have been identified through the assessment and are based on NDRMF and PMD budget estimates, as well as consultations with NDMA.

[14] The hazard risk environment would be defined through the multi-hazard risk assessment undertaken by the NDMA but should be followed up by the development of a probabilistic multi-hazard model for the country based on which risk and associated insurance premiums could be developed.
[15] MoE is in the process of developing a climate change national action plan through the One-UN Environment Program.

Table-Annex-2.1: Disaster Management - Needs Estimation of Recovery and Reconstruction

	Prioritized Actions	Needs	
		PKR	US$
Short-Term			
1	Management study of NDMA and existing parallel DRM structures for assimilation	42.5	0.5
2	Development of a central MIS System at NDMA with appropriate linkages with Federal, Provincial and District Response Agencies – including aid tracking and management systems at all levels	170	2
3	Technical assistance and hardware support for NDMA, PDMAs and operationalization of DDMAs in 30 priority districts	425	5
4	Social mobilization and training communities on preparedness/response in 30 priority/high-risk districts (including equipment for first responders)	255	3
Medium- to Long-Term			
1	Flood hazard mapping	170	2
2	GIS-based inundation profiling and of coastal districts	85	1
3	Development of a multi-hazard national Integrated Decision Support and Alert System with focus on Flood-related Disaster Management (NIMS)	425	5
4	Assessment and identification of potential disaster risk insurance options and development of a strategy for catastrophe risk financing mechanisms and solutions including some piloting	170	2
5	Strengthening the capacity of national climate change centers and creating awareness on climate change issues	212.5	2.5
6	Development and Integration of DRM in education and awareness building at all levels	255	3
7	Develop capacity for carrying out various assessments, such as multi-hazard risk assessments and damage and needs assessments (DNA)	85	1
	Total	**2,295**	**27**

Overall Needs: US$ 27 million

ANNEX-3: ENVIRONMENT

Background

1. The recent floods in Pakistan caused environmental damage and losses to the population, heightened environmental health risks and affected forests, wetlands and other natural systems. The Government estimates that 1.9 million households have been affected. Environmental degradation and its effects on human health were already a significant development challenge in Pakistan, which has some of the highest prevalence rates in South Asia for child mortality, diarrhea and acute respiratory illnesses associated with environmental factors. The conditions created by the floods could result in a significant increase in these and other illnesses. The damage caused by the floods was aggravated by acute environmental degradation of watersheds driven by numerous causes, including lack of and ineffective regulations to protect natural resources.

Environmental Baseline of the Indus Watershed

2. This section describes the general conditions of the Indus Watershed, particularly its forests and wetlands, environmental health problems in the country, and waste management practices in flood affected areas.

3. ***Vulnerability of the Indus Watershed.*** As evidenced by the floods, the Indus Watershed is highly vulnerable to extreme weather events, which are expected to increase in frequency and intensity as a result of climate change. The high economic and human losses of flooding have not deterred the continuing growth of settlements on the Indus River's flood plains, some of which have been incentivized by development initiatives and investments. Permanent flood conditions have not altered the way Pakistan's growing cities organize services, promote production systems or develop infrastructure.

4. ***Environmental Sensitivity of Wetlands.*** In total, 220 wetlands are categorized as Significant Wetlands in the Indus Watershed, including 42 Protected Wetlands (1,479,794 ha) and four additional Ramsar Sites (60,646 ha) that do not have a protected status. When their ecological functionality is maintained, these wetlands provide livelihoods to communities, as well as valuable services, including flood protection.

5. However, in the last decades, these wetlands have been threatened by: (i) the destruction of, or encroachment on, habitats due to the expansion of settlements and cultivation fields, decreasing water availability and flood control protection services; (ii) deforestation of gallery forests; (iii) interference with natural flood processes and connections between the river and natural lagoons and other wetlands; (iv) pollution of rivers and streams from untreated sewage discharges and untreated industrial effluents; and (v) lack of appropriate management plans and skilled personnel.

6. ***Forest Cover.*** Pakistan's deforestation rate was estimated by WWF (2009) to amount to 2.1 percent per year, the highest in Asia. Between 1992 and 2001, the country's forest land decreased from over 4.24 million hectares to 3.44 million hectares. Deforestation is highest in the Indus Delta mangroves, with an annual rate of 2.3 percent, compared with a rate of 1.99 percent for coniferous forests and 0.23 percent for riverine forests. Currently, there is no clear policy to arrest deforestation, much of which is driven by governmental initiatives.

7. In the Indus Delta, in the last decades, less than 50 percent of the mangrove forest area is inundated even in high floods. As a result, the mangrove forest area is shrinking alarmingly while less salt tolerant species have almost disappeared.[51]

[51] Source: Website of Indus Ecoregion Programme (http://foreverindus.org/ie_ecosystem.php)

Status of Environmental Health

8. The floods have had significant effects on human health. Pakistan already suffers an annual loss of 8.84 percent of its GDP from environmentally-related diseases. Almost half of this cost is caused by mortality (4.13 percent of GDP) while the rest (4.71 percent of GDP) stems from malnutrition caused by environmentally-related diseases. Approximately 90 percent of typhoid and diarrheal illness in Pakistan and up to 83,500 deaths a year are attributable to inadequate drinking water, sanitation and hygiene. Morbidity linked with waterborne diseases amounts to 74.5 million cases per year. Indoor air pollution accounts for over 28,000 deaths per year and 40 million cases of acute respiratory illness, particularly in children under the age of 5 years.[52]

9. Stagnant water pools breed vectors such as mosquitoes, which can cause malaria and other similar diseases in nearby communities. Malaria is the second most prevalent and devastating disease in the country, with 4.5 million clinical cases reported in 2004 and 3.5 million in 2006.[53]

Waste Management Issues

10. Municipal solid waste generation in the affected communities is estimated at 2,900 tons per day.[54] Most of this is disposed of in open dumps; manual sanitary landfills are only used in a few cities. Industrial waste in the flood affected areas includes chromium, phenols and solvents, among others. Most of this waste is disposed of in open dumps, where it mixes with solid waste. In addition, large quantities of waste effluents are generated in the affected areas, most of which are released into the environment without adequate treatment.

Estimates of Damage, Losses and Needs and Technical Assistance in Environmental Non-Structural Interventions for Flood Protection

11. This section summarizes the environmental damage and increased environmental health risks caused by the floods. It also outlines and provides cost estimates for the priority actions needed to help Pakistan manage the environmental aspects of the current crisis, while laying the foundations for a comprehensive strategy that reduces the country's vulnerability to floods.

12. Strengthening the resilience of the Indus Watershed requires a river basin management approach that fosters coordination of policies and actions by provinces at risk. It also requires a combination of structural and non-structural measures, which include decisions on where people live, where industry and commerce is located, cutting of forests and development of marginal lands, as well as flood warning and civil defense measures in lesser priority areas. Non-structural interventions that integrate with existing cultural or social institutions are likely to be cost-effective and improve security.[55] In addition, there is a need to strengthen local rules and their enforcement to overcome current deficiencies in flood protection and other environmental concerns.

Institutional Frameworks, Planning, and Capacity Building to Reduce the Risk of Floods

13. As described above, environmental degradation exacerbated the effects of the floods, particularly as destruction and degradation of natural ecosystems reduced the capacity of natural vegetation to provide flood-protection services. While legal and institutional frameworks for flood protection and natural resource management are in place, they are largely ineffective. Following is a description of key elements of existing frameworks that need to be revised and strengthened:

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[52] World Bank (2008). Environmental Health and Child Survival, Epidemiology, Economics, Experiences

[53] National Health Information Management System (HMIS) 2006.

[54] Basis: 1.91 m affected households; 1.5 kg of MSW generation per day. Number of affected households based upon NDMA website (http://www.pakistanfloods.pk/en/damage/summary-of-damages) accessed on 29 Sep 2010.

[55] Examples of this include: (i) design of multi-purpose schools or clinics that can also serve as emergency shelters or supply storage for storms or floods; or, (ii) use of public address systems in village mosques as part of early warning systems.

14. ***Storm water drainage master plan for urban areas.*** The master plan would mainly: (i) recommend key structural and non-structural storm water drainage and flood protection interventions to minimize vulnerability to floods and channel flood and storm water away from heavily populated areas; and (ii) identify, at the city level, areas that are vulnerable to flooding where development should not be permitted. **PKR 714 m (US$ 8.4 m).**

15. ***Land use plans and building regulations in urban areas.*** After updating the master plan, detailed land use plans for fourteen priority areas would demarcate areas where development is permissible. Building regulations would then be updated to define the characteristics of such development. PKR 366 m (US$ 4.3 m); enforcement support: **PKR 238 m (US$ 2.8 m).**

16. **Monitoring and evaluation and information databases.** Established in three phases (short-, medium- and long-term), these databases would improve the effectiveness of interventions. **PKR 442 m (US$ 5.2 m).**

Strengthening Legal and Institutional Frameworks

17. These frameworks need to be revised and strengthened to restore and protect natural systems such as forests, wetlands and mangroves and should be made more effective with institutional strengthening and capacity building. **PKR 476 m (US$ 5.6 m).**

Damage and Actions for the Restoration of Natural Systems in the Indus Watershed

18. ***Damage.*** The damage to riparian and non-riparian forests, as well as wildlife resources, reported by the provinces is about PKR 992 m (US$ 11.67 m)[56] . These estimates include damage to trees and forest lands, avenue plantation, block plantation, forest nurseries, and Department infrastructure and other assets. No estimates are available for the damage to wetlands and mangroves, for which follow-up studies are needed.

19. ***Restoration of Natural Systems.*** Up to 2010, most efforts in Pakistan to manage the effects of floods focused on structural measures, such as large-scale and capital-intensive embankments. However, relying only on rehabilitating these structures might be unduly expensive, yield low returns, engender a false sense of security in the floodplains, and accelerate damage to ecosystems in normally flooded areas. Restoration of forests, rangelands, and wetlands in the catchment areas, as well as riparian vegetation in the Indus flood plains and its tributaries must be incorporated into the flood prevention initiative. All of these interventions would be carried out in a phased approach and would involve communities to ensure their sustainability. The key elements and associated cost estimates are described below.

20. ***Forest Restoration.*** Forest cover attenuates peak flows and the runoff of water. Forests need to be protected to reverse the prevailing trends of deforestation on an urgent basis. In addition, degraded and denuded forests need to be restored in a systematic manner. The estimated cost of forest restoration critical to flood prevention is **PKR 3,750 m (US$ 44.12 m)**, while the medium- to long-term restoration cost is estimated to be **PKR 112,750 (US$ 1,326.47).**[57]

21. ***Riparian Vegetation Restoration.*** Riparian vegetation plays an important role in flood control (particularly in the plains), controlling ingress of sediments in the river and nutrients and pollutants in the water bodies, and stabilizing stream channels. Riparian vegetation in Punjab and Sindh needs to be protected and restored to be part of an effective natural flood control system. The estimated cost of

[56] The team did not receive data on forest damage for Sindh and GB.
[57] Medium- to long-term costs are not included in the reconstruction costs table.

restoration of riparian vegetation critical to flood prevention is **PKR 4,410.67 m (US$ 51.89 m);** while the medium- to long-term restoration cost is estimated to be **PKR 23,881.33 m (US$ 280.96 m).**[58]

22. ***Wetland Restoration.*** Wetlands help regulate river flows, filter pollutants, are spawning zones for fish, and provide sources of livelihood for communities. Severely degraded wetlands need to be recovered and restored and the associated cost is estimated to be **PKR 340 m (US$ 4.0 m);** while the medium- to long-term restoration cost is estimated to be **PKR 9,180 m (US$ 108.0 m).**[59]

23. ***Mangrove Restoration.*** In order to protect the coastal areas from sea storms and sea intrusion, the mangrove cover lost over the years needs to be restored. Restoration of severely degraded mangroves is estimated to cost **PKR 500 m (US$ 5.88 m);** while the medium- to long-term cost of reestablishing mangrove cover lost over the years is estimated to be **PKR 12,700 m (US$ 149.41 m).**[60]

Burden on Environmental Health and Proposed Responses

24. ***Disease Vectors from Stagnant Water.*** The receding flood water will leave behind some 4,146 stagnant water ponds in the affected areas. These ponds are the main source of disease vectors such as mosquitoes, and need to be dewatered. **PKR 637 m (US$ 7.49 m).**

25. ***Waste Handling.*** The affected population generates an estimated 2,900 tons of solid waste per day. To avoid increased risks of water pollution and the associated health problems, solid waste from affected communities will need to be disposed of in marginal landfills over a period of six months. **PKR 1,258 m (US$ 14.8 m)**. In addition, gross estimates for the disposal of hazardous and medical waste spilled as a result of the floods are: hazardous waste, **PKR 2,550 m (US$ 30 m)**; medical waste, **PKR 30 m (US$ 0.4 m).**

26. ***Debris Disposal.*** Inappropriate disposal of debris can potentially cause environmental problems such as water contamination, siltation resulting in shortening of water reservoir lifespans, effects on aquatic flora and fauna, and reduction in the services provided by wetlands. While a follow-up study is recommended to carefully assess this damage, the cost of environmentally safe debris disposal is estimated at **PKR 1,008 m (US$ 11.9 m)**.

Protected Areas and Cultural Assets

27. No estimates are available for the damage the floods caused to cultural assets. There have been reports that the Makli Hills, a World Heritage Site, have been used by displaced people as a camping area. In addition, floods have reportedly damaged several shrines in Sindh and Punjab. Furthermore, the Moen-jo-Daro ruins were surrounded by flood water, a situation which could further exacerbate the damage to the ruins caused by rising groundwater through capillary action. Detailed field surveys by archeologists have been proposed to determine the extent and nature of this damage, if any, and the associated restoration costs.

Additional Studies

28. Accurate damage data of several environmental aspects could not be obtained for a variety of reasons, including difficult access to some of the areas and lack of appropriate environmental monitoring networks within the country. To address these data gaps, separate follow-up studies are proposed in relation to: (i) identification of large landslides (particularly in GB) and their feasible rectification/remedial measures; (ii) identification of sites of large debris accumulation and its safe disposal in flood

[58] Medium- to long-term costs are not included in the reconstruction costs table.
[59] Medium- to long-term costs are not included in the reconstruction costs table.
[60] Medium- to long-term costs are not included in the reconstruction costs table.

affected areas; (iii) identification[61] of large stagnant water pools and a strategy to address these; (iv) determination of restoration needs in camps; (v) survey of toxic/hazardous substance leakages to determine remedial measures; (vi) survey of Cultural Heritage sites to determine the extent of damage; and (vii) acquisition of SUPARCO's services for satellite remote sensing data on environmental damage. The first three studies will be commissioned by the Local Government and/or Communications and Works Departments, while the remaining studies will be managed by the Ministry of Environment in collaboration with its provincial arms. **PKR 34 m (US $ 0.40 m).**

Summary

29. The floods that recently affected Pakistan have impacted millions of people and their consequences are likely to be felt for years to come. While the floods were initiated by a natural phenomenon, anthropogenic interventions exacerbated their impact, particularly as destruction and degradation of natural ecosystems reduced the capacity of natural vegetation to provide flood protection services. In addition, the development of settlements and croplands in flood plains and riverbeds, along with sole reliance on embankments and other types of inadequate flood protection measures, created the conditions for the current human tragedy. This document has outlined the priority actions needed to help Pakistan manage the environmental aspects of the current crisis, while also laying the foundations for a comprehensive strategy of structural and non-structural measures that reduce the country's vulnerability to floods.

30. The floods have caused damage of about **PKR 992 m (US$ 11.67 m)**[62] to the environment sector. The damage, reconstruction and restoration costs for the short-term measures discussed in this report amount to **PKR 17,746 m (US$ 209 m)**, as summarized in the table below, while the medium-term reconstruction and restoration costs are estimated to be **PKR 158,511 m (US$ 1,865 m)**.[63]

Table-Annex-3.1: Environment- Damage, Reconstruction and Restoration Costs

Description	Short-Term PKR millions
Institutional Strengthening, Planning, and Capacity Building to Reduce the Risk of Floods	2,236
Damages to Forests and Wildlife Resources	992
Restoration of Forests, Riverine Vegetation, Wetlands, and Mangroves	9,001
Environmental Health	637
Management of Solid, Hazardous, and Medical Waste and Debris	4,846
Additional Studies	34
Total (PKR million)	**17,746**
Total (US$ million)	**209**

[61] The number of stagnant water ponds has been estimated based upon assumptions, costs determined accordingly. However, exact numbers and locations of these ponds still need to be ascertained.
[62] The team did not receive data on forest damage for Sindh and GB.
[63] Medium- to long-term costs are not included in the overall reconstruction needs estimates of the assessment.

ANNEX-4: SOCIAL AND GENDER

Gerhard Juren

Social Aspects

1. This section discusses the social aspects of the floods, focusing on the socio-economic effect on groups that are likely to be disproportionately affected by loss due to pre-existing poverty levels and social inequality. It also takes into account communities' cohesion and social (including gender) relations and the challenges they face in re-establishing their lives. Cross-cutting themes and key priority areas for consideration, social safeguards and recommendations are also considered. One of the challenges of this analysis is that information has not been collected at the household level. Little data is available that is disaggregated by sex, age and vulnerable groups. Instead this assessment is based on information provided by federal and provincial governments, secondary data from national and provincial information sources, reports and interviews with local and international development partners and focus group discussions, semi-structured interviews with the key informants, consultations with community-based organizations (CBOs), national and international non-governmental organizations (NNGOs and INGOs) and direct observation in select affected communities across the provinces.

2. The floods that surged through Pakistan over the past two months destroyed homes, livelihoods and devastated communities. It has also disrupted assistance to 2.5 million conflict-affected internally displaced persons (IDPs), and shifted much-needed focus away from the Post Crisis Needs Assessment (PCNA).

3. The floods exposed the fragility of people's lives, but at the same time create an opportunity to rewrite the social contract, to build back better lives and to step up to the task of bringing dignity to the millions who live on the margins of society. Both poor and non-poor have been hit, however, the poor and vulnerable bear the brunt of the catastrophe, most of them with no assets or safety nets to fall back on. It is the landless rural poor, settlers in *katcha* areas and informal settlements in the urban slums that are hardest hit. The impact on households and the speed of recovery will vary based on a number of factors. There is no 'one size fits all' recovery solution - each intervention has to be tailored.

Social Baseline

4. Pakistan is already struggling with low social development indicators, ranking 141 out of 182 countries in the Human Development Index (HDI) and 124 out of 155 countries in the Gender Development Index (GDI). 22.3 percent of the population live below the poverty line. According to a 2008 UN joint assessment 45 million people are estimated to be severely food-insecure[64] and almost 40 percent of children are underweight. The literacy rate for over ten years is 57 percent,[65] being much higher in urban than rural areas and higher for men than for women. Life expectancy at birth for women is 65 and 63.3 for men.[66] There are 6.1 million missing women/girls in Pakistan.[67] Female participation in the labour force market is 22 percent, yet even this low figure does not imply economic empowerment and freedom from poverty.[68] Enrolment in official schemes is dependent on possessing a National Identity Card (NIC), issuance has been patchy, and more men than women have been registered (98 percent men, 71.2 percent women).[69] NADRA also confirmed that registration of informal dwellers in *katcha* areas is lagging behind. Pakistan's existing water and sanitation standards are poor with no potable water, most households have no sewerage connections and 32 percent of rural inhabitants have no toilets. Among the rural landless, poverty is highest among sharecroppers.[70]

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[64] Quoted by the World Food Program at http://www.wfp.org/countries/pakistan
[65] Pakistan Social and Living Standards Measurement Survey (PSLM 2008-2009)
[66] Pakistan Economic Survey 2008-2009
[67] UNDP 2010.POWER, Voice and Rights. A turning point for GENDER Equality in Asia and Pacific. Asia Pacific Human Development Report. Colombo, Sri Lanka. UNDP Regional centre for Asia Pacific.
[68] In 2008-09 27.6 percent females and 26.6 percent males (non-agricultural workers) were in formal sector and 73.4 percent and 72.4 percent females were in the informal sector.
[69] http://nadra.gov.pk/index.php?option=com_content&view=article&id=168:nadra-launches-drive-for-100pc-registration&catid=10:news-a-updates&Itemid=20
[70] Reducing the gender gap. Khawar Mumtaz, prepared for PRSP-11

Floods Social Aspects

5. ***Loss of Livelihoods and Assets:*** Landless households, small landholders in rural areas, those in urban informal settlements and fisherfolk have borne the brunt of the floods, losing almost all their assets.[71] The number of households reporting no major source of livelihood increased six times.[72] Livestock production is critical to the economy and in 2007/08 it accounted for 10.9 percent of GDP[73] An estimated 30-35 million people in the rural economy are engaged in livestock rearing. Agriculture not only serves as food security for farmers but is also the backbone of GDP. Post-flood, farming, the primary livelihood of 50 percent of households - is now the livelihood of only 10 percent. In KP, the agriculture losses are estimated at 50 percent, while in GB, Punjab and Sindh they are estimated at 90-100 percent. An estimated 2.3 million hectares[74] of standing crops has been lost. The available official reports[75] from the provincial governments report losses of 20 - 50 percent of the cultivated land in the most affected districts. At the time of the floods the cotton crop was ready for harvesting. This is a major cash crop of Pakistan and a very large percentage of households rely on the seasonal income for the rest of the year. More than 50 percent of households report complete loss of their cotton crop which has dire consequences for men and women who have taken loans with the intention to pay them after cotton harvesting. The McRAM reports 50 - 100 percent cropland losses, a significant proportion of which will not be ready at least for the next crop season. The problems caused by land erosion in some areas and loss of reference points for land demarcation will make it further difficult for land to be ready for the next crop season. The loss of largely *katcha* houses of the rural and urban poor will severely impact on households if they are not provided sufficient support to build back safer and better. Similarly, damage to essential public facilities and loss of services will disproportionately affect the poor

6. Women, who traditionally have an active economic role, for example in cotton crop harvesting and rearing livestock, have also been immediately hit. This includes their activities related to home gardens, rearing backyard animals and home-based work.[76] The generally used economic models calculate on the basis of the household as the unit of analysis, where women's work is rendered invisible and therefore they may not be targeted as beneficiaries of livelihood or asset creation.[77]

7. ***Trends in Migration:*** The floods have further increased deprivation in districts and *katcha* areas, increasing the possibility of a trend of rural to urban, intra-provincial and inter-provincial migration in search of livelihoods, having caused the forced displacement of more than 17 million people.[78] Unless comprehensive programs to rehabilitate livelihoods and shelter for the communities are developed and implemented soon, loss of livelihoods, fear of starvation, disease and desperation may increase the outflow from these areas, adding to the already strained services and infrastructure in urban areas.

Gender

8. Women are barely visible in the public spheres, particularly in rural areas. The Preliminary Gender Needs Assessment report by UNIFEM reports that women may become unnoticed in the compensation process as their economic contribution is usually invisible. The devastation caused by the floods destroyed their limited assets, worsened their personal security situation and changed their responsibilities as they are forced to respond to emergency conditions. In certain provinces, cultural norms such as '*purdah*'[79] limit women from being able to articulate their needs.

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[71] Reports from field visits, FGDs and draft initial findings of the McRAM Survey have been generally used for assessments in this section.
[72] McRAM draft assessment report
[73] SDPI
[74] GIS based assessment provided by SUPARCO to the Agriculture sector team.
[75] Punjab and Khyber Pakhtunkhwa from the Agriculture sector data templates.
[76] UNIFEM Rapid Gender Assessment, August 2010
[77] ibid
[78] http://esa.un.org/migration/p2k0data.asp
[79] The term purdah, meaning 'curtain' is used to describe the traditional seclusion of women in the Middle East and parts of Southeast Asia.

9. In periods following disasters women's medical, hygiene and nutrition needs are frequently neglected; girls' education is not prioritized; livelihoods for women are not a priority; and their communication channels outside the household are destroyed. In this setting, women and girls are vulnerable to becoming family assets with the risk of their being traded as commodities. If not properly addressed, this disaster could lead to increasing maternal and child mortality, decreasing literacy rates, increasing gender based violence, as well as decreasing economic autonomy. Land rights which are challenging for poor men, are even more challenging for women. The devastation caused by the floods destroyed their limited assets and worsened their personal security. While women's health is vital to the well-being of their families, after disasters, traditionally as caregivers, they tend to place their needs last. These factors could significantly worsen pre-existing gender inequalities, and increase women's invisibility in the political and economic spheres. Asset creation, such as land distribution with title, restoring old and creating new livelihood opportunities are required to avoid further marginalisation and ensure women's equitable access to reconstruction support. A gender mainstreaming framework is annexed.

Impact on Vulnerable Groups

10. Catastrophic events that impact on basic human needs disproportionately affect the most vulnerable groups - women, children, minority groups, the elderly, the landless tenants and people with special needs. Existing vulnerabilities are exacerbated, and new vulnerabilities emerge as some who were previously economic secure are now unable to meet their daily needs. It is essential that the Government adopts a rights based development approach to reconstruction. The number of people assessed as 'extremely vulnerable' (lost everything in their houses and do not have a safety net, in need of immediate relief) and 'vulnerable' (lost crops and livelihoods and have access problems) in the flood affected areas is high. For example, the Vulnerability Assessment Mapping (VAM) carried out in Punjab in mid-August estimated that 3.4m, or 64 percent of the total affected population is extremely vulnerable, and, of those, 1.1m, or 33 percent, is vulnerable.[80]

11. 3.5 million children[81] are affected by the floods which have destabilized the educational system, both in the affected districts where schools have been lost (10,000 in total in the public sector), and in the districts where camps have been set up in public schools. The lack of livelihood opportunities for parents and temporary closure of schools risks an increase in child labor, forced/child marriages and trafficking. Child-headed households are particularly vulnerable. Widows, single women-headed households and women never married are another vulnerable group as their opportunities for social mobility and for employment outside the house are limited. The proportion of single-headed households varies in the different affected provinces. In AJK, the proportion is high, around 20 percent due to labour migration, while in Balochistan and parts of KP and FATA widows are primarily taken care of by male relatives.[82] Bonded labourers with high levels of debt may be forced to repay their existing debts with the cash transfers they receive. One estimate puts the number of bonded labourers at 17 million.[83] There are approximately 1.7 million landless agricultural workers (haris) and sharecroppers in five districts of Thatta, Dadu, Badin Mirpurkhas and Umerkot who are in debt bondage.[84] Those in *katcha* areas and remote locations risk being excluded from reconstruction efforts, as do ethnic and religious minorities, Afghan refugees and IDPs from conflict-affected areas. The permanently disabled

[80] WFP, Punjab Floods 2010 Initial Vulnerability Assessment of Flood Affected Areas, 12-14 August 2010. Post-floods, the MCRAM assessment found that 60% of households lacked a main source of income. The MCRAM assessment noted that households were resorting to a range of coping strategies known to have negative impacts, including: going further into debt, reducing meal sizes, skipping meals, and women eating less than men. Some households said that they would spend less on healthcare in order to purchase food while others reported that they would withdraw their children from school.

[81] As of UNCOCHA updates (6th September 2010). According to the census figures of 1998 children aged 0-14 years is 42.4 (20.3% girls and 22.1% boys). 15-29 years is 26.7 % (13.1% women and 13.6% men). The child-dependency ratio is 61.7, the highest in the South Asia.

[82] 0.5% of women are divorced women and 7.8% are widowed (rising to 45.8% in 60+ years of age). 8.1 % households are women headed (8.1% rural and 8.3% urban) and households headed by divorced women 0.1, and by widows 3.2%. Female households are of two types: (i) households where the male member is working abroad or in the big cities; and (ii) divorced women and widows without male support (0.1% in rural areas, 3.2 % in urban areas).

[83] 'State of Human Rights in 2007'. Human Rights Commission of Pakistan. Page 7 http://www.hrcp-web.org/pdf/Archives%20Reports/AR2007.pdf.

[84] Research carried out by the Government of Sindh and ADB 'Glimpse of situation; Life in bondage', issue 1, August 2007

(10 percent) and the elderly (5.5 percent) are also at risk, particularly when targeting is based on registration at central locations and when there is competition over limited resources. Special support programs targeted at vulnerable groups need to be developed during the reconstruction program. The challenge lies in looking beyond relief, beyond restoration to improving lives and offering opportunities over the longer-term. Failure to redress existing structural inequalities means many risk falling into chronic poverty and will not have the opportunity to lead a dignified life.

Impact on Aid Effectiveness and Social Accountability

12. Where networks are in place to distribute humanitarian aid, it has become the lifeline. However, initially these networks were few in number, narrow in geographical coverage and low in capacity. Lack of preparedness and coordination proved a major challenge and access has been limited due to flood and security-related concerns. Some NGOs are working with the NDMA and Provincial DMAs to avoid duplication of efforts. According to some NNGOs, double-counting of assistance by NGOs remains a concern. Others report 'ghost camps' for which money is allocated.[85] One of the recommendations of this report it that transparency in activities, financing, results monitoring and disclosure is essential.

Social Cohesion and Community Participation

13. The impact on social cohesion and social relations varies significantly across the affected areas as a result of the wide geographical extent of the floods and the cultural diversity of the affected people. In KP and FATA, the PCNA in 2009 had already identified a breakdown of the traditionally established social order. New, younger, radical groups had increasingly become at the centre of local level decision making and the flood disaster has provided them with the opportunity to fill the gaps in the relief effort. The dearth of resources and assets, increasing debt, the lack of civic infrastructure and the process of re-establishing land demarcation is likely to exacerbate existing tensions along tribal, religious or ethnic lines. An increase in aid-related conflict has been reported and will likely increase if systematic planning and implementation measures are not put in place. Communities and civil society organizations should be at the centre of decision making, and the Government should be ready and committed to meet its responsibility to provide basic human needs and protect citizen's constitutional and civic rights.

Recovery and Reconstruction: Social Safeguards and Recommendations

14. The social impact of the floods does not cease with the receding water, but will continue to develop and affect communities. Drawing from the observations in this Annex, the following are a series of social safeguard recommendations which would contribute towards a constructive reconstruction process underwritten by a 'do no further harm' approach that aims to build back better lives:

Recommendations to the Government and International Community:

15. ***Roll out a vulnerability assessment model:*** In order to better assess needs, immediate roll-out of a vulnerability assessment model[86] with social and gender analysis mainstreamed, using both quantitative and qualitative data gathering is needed.

16. ***Build back better lives:*** Building back better infrastructure is not sufficient to improve the lives of the millions affected: buildings are only as good as the community infrastructure and services they support. An opportunity exists to address systemic issues that subvert the development agenda, to focus on the poor, including the highly vulnerable bonded and child labourers, build assets, change tired

[85] NNGO consultation with ADB, 14.09.10
[86] As previously recommended in the Inter-Agency Evaluation of the humanitarian response to the 2009-2010 displacement crisis, August 2010

words into action, identify targets and monitor progress and results. Support in both cash and kind, including land distribution, joint ownership to the landless and tailored programs to assist women in particular, should form the basis for improving livelihoods over the longer-term.

17. ***Remember that no 'one size fits all':*** Pre-existing socio-economic differences, social relations, geography, as well as governance structures, require a customized, dynamic approach to reconstruction in order to respond to communities' needs and avoid exacerbating inequalities, social tension and conflict. There is no 'one size fits all' - support must be tailored according to need.

18. ***Support community-led reconstruction and put in place a communication strategy:*** Those best able to determine what is needed in order to rebuild damaged communities are usually the communities themselves, and their involvement improves the chances that recovery will be locally supported and sustainable. Loss of voice is a major risk while providing expeditious and relevant reconstruction support, particularly for women. Alongside this, an effective communication strategy is necessary to reduce the current environment of confusion, rumour and frustration within the flood affected populations.

19. ***Maximise peace-building opportunities:*** The reconstruction program should consider how each flood-related intervention might be maximised in terms of dividends (peace / stability) and not overlook the longstanding needs of the conflict affected districts.

20. ***Bolster preparedness:*** CSOs should scale up their disaster risk reduction programs and disaster response training to bolster preparedness for future disasters and seize the opportunity for risk reduction and development of programs to improve livelihoods post-disaster.

Recommendations to the Government:

21. ***Respect due process of law and establish an effective grievance mechanism:*** Reconstruction efforts to restore services and essential infrastructure may require involuntary land acquisition (Annex 1). If further harm to people is to be avoided, hasty decisions to clear settlements in the flood path and from *katcha* areas must be avoided. Decisions should be based on considered and empathetic planning. Regional and international policies and law precedents are available. When developing infrastructure, effective safeguard measures and implementation mechanisms need to be put in place to ensure people are promptly compensated, along with appropriate and effective grievance redressal mechanisms. The Government should enhance efforts to enforce laws to protect the vulnerable.

22. ***Provide additional support to vulnerable households and a moratorium on land sales:*** Opportunities for reorganizing informal settlements and equitable land distribution to the landless should be explored[87]- whilst this is assessed, a moratorium on land sales will minimize opportunist interventions and help stabilize a chaotic situation, stem price escalation and allow for the revenue authorities to reconcile records.

23. ***Replace lost documentation:*** Loss of records secured in public and private buildings will further hamper peoples' ability to restart their lives.[88] Recreating lost records and issuing temporary records (all fees waived) will enable households to access essential services and support programs. Elite capture of undocumented lands should be prevented. Transparency and third party validation is essential when

[87] The majority of the land, especially in Sindh and Punjab provinces, is owned by less than 1% of the total landowners

[88] The MCRAM assessment found that households in all provinces lost ID cards, property documents and birth or death certificates. In Sindh, 8% of people interviewed said that they had lost ID cards, 4% said that they had lost property documents, and 1% said that they had lost birth or death certificates. While these figures are not particularly high, this must be understood in light of the fact that a significant proportion of people never owned such documents in the first place.

dealing with land matters. It is essential that NADRA registers all affected households without discrimination and exclusion.

24. ***Build partnerships and institutional capacity:*** Partnerships between local communities and the Government should be strengthened so as to be able to respond more effectively to the threat of future disasters. The Government should make all efforts to build the capacity of ministries and line agencies, and of institutions at local level.[89] The focus should be on prevention rather than repeated crisis management.

25. ***Lead by example with full transparency:*** Regular monitoring of budgets, expenditure and activities should be undertaken by independent parties, and made publicly available. Communities involved must be allowed access to this information; the Government must lead the effort.

26. ***Establish an IDP census and a 'National Resettlement and Rehabilitation Act':*** A census would identify vulnerable households for targeted support; it must ensure households who have never had records or formal records of land tenure arrangements are not excluded during registration. An opportunity exists to redefine land administration in Pakistan. The absence of policies and institutions for land management needs to be urgently addressed. Drawing from examples from the region and internationally, a National Resettlement and Rehabilitation Act for IDPs is urgently required.

Framework for Social Development and Recovery

27. While developing the framework, analyses should consider, among others: socioeconomic factors (impact on quality of life, livelihoods); social cohesion and relations (including ethnic, community-specific concerns); social accountability and aid effectiveness (including right and access to information, rule of law); assessment of sustainability (financial and social) and contribution to longer-term development interventions; assessment of how much local capacity exists within communities, households and local institutions.

28. Further, the impact of the floods should be assessed using filters such as: sex, age, urban vs. rural settlements, formal vs. informal settlers, formal vs. informal sector workers, land-owners vs. those who do not own land, vulnerable groups (including minority groups, IDPs, bonded labourers, youth and child labourers, the elderly, nursing mothers and pregnant women, the disabled or wounded), environmental degradation and impact.

[89] Concern over low institutional capacity at local level expressed at NGO consultation, ADB, 14.09.10
Category A (significant impacts): 200 or more people physically displaced from housing or losing more than 10% of their productive assets (income generating).
Category B: Impacts not significant, resettlement plan required. Category C: No impact, no further action required.

Table-Annex-4.1: Social and Gender - Involuntary Resettlement Screening Checklist

To be processed separately for all sub projects under different sectors

Name of Enumerator:_____ Date: _____

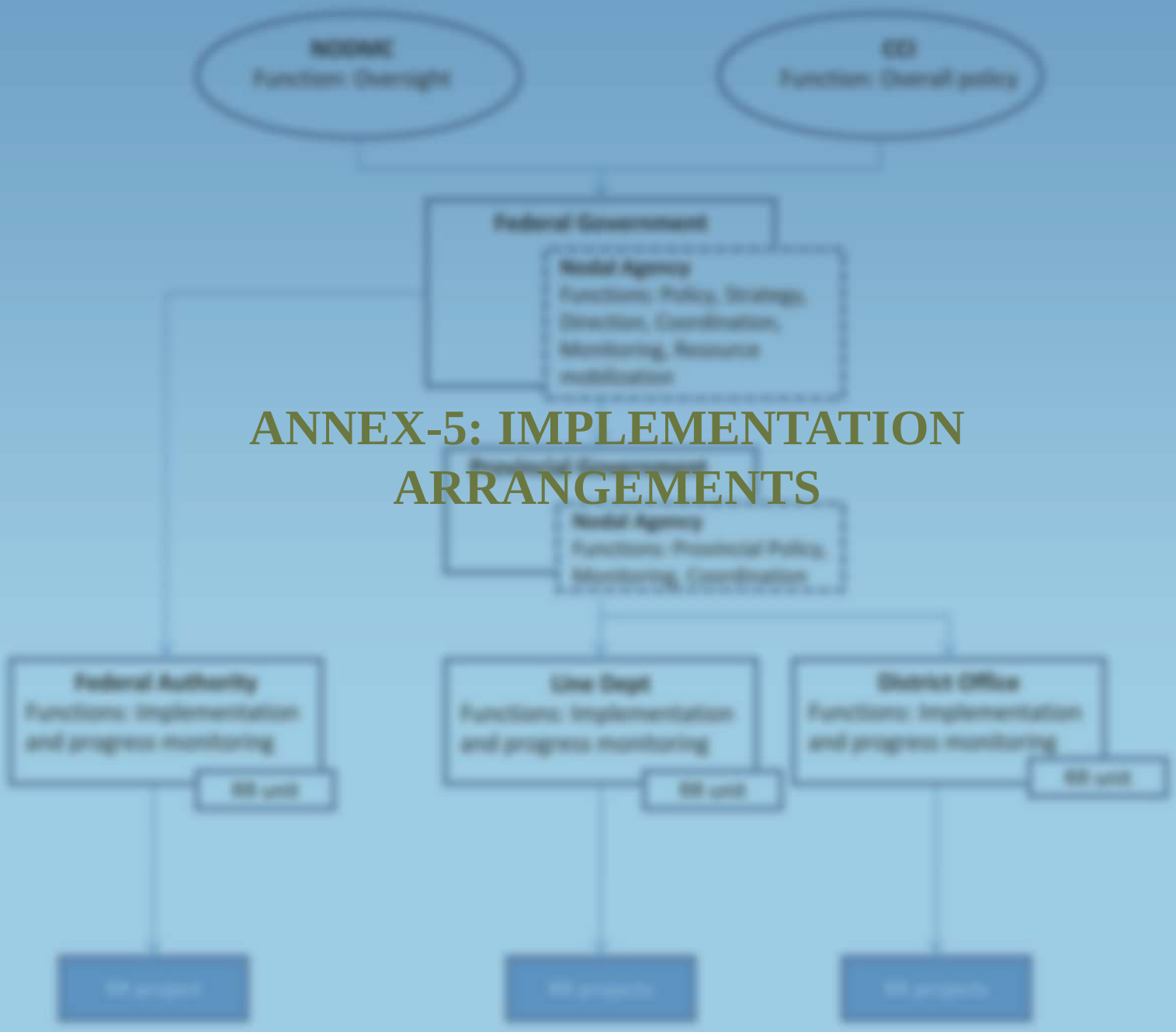
Province:_____ District:_____ Sub-project:_____ Sector:_____

Project Categorization: A B C [90]

Potential Impact	Yes	No	Expected	Remarks
Does the sub-project involve any physical construction work, i.e. rehabilitation, reconstruction or new construction? Specify in "remarks" column.				
Does the sub-project involve impact on land, assets and people, if "Yes" quantify the impact and check following items. If "No" impact, explain the situation in "remarks" and move to section 2.				
Potential impacts				
Land (quantify and describe types of land in "remarks column").				
Government or state owned land free of occupation (agriculture or settlement)				
Private land				
• Residential				
• Commercial				
• Agriculture				
• Communal				
• Others (specify in "remarks").				
Land-based assets:				
• Residential structures				
• Commercial structures (specify in "remarks")				
• Community structures (specify in "remarks")				
• Agriculture structures (specify in "remarks")				
• Public utilities (specify in "remarks")				
• Others (specify in "remarks")				
Agriculture related impact				
• Crops and vegetables (specify types and cropping area in "remarks).				
• Trees (specify number and types in "remarks").				
• Others (specify in "remarks").				
Affected Persons (DPs)				
• Number of DPs				
• Males				
• Females				
• Titled land owners				
• Tenants and sharecroppers				

Category A (significant impacts): 200 or more people physically displaced from housing or losing more than 10% of their productive assets (income generating). Category B: Impacts not significant, resettlement plan required. Category C: No impact, no further action required.

Potential Impact	Yes	No	Expected	Remarks
• Leaseholders				
• Agriculture wage laborers				
• Encroachers and squatters (specify in remarks column).				
• Vulnerable DPs (e.g. women headed households, minors and aged, orphans, disabled persons and those below the poverty line). Specify the number and vulnerability in "remarks".				
• Others (specify in "remarks")				
Section 2				
Others (specify in "remarks").				
Are there any tribal people, indigenous or other minority groups affected by land acquisition or project activities. If "Yes" check the following items				
• Indigenous groups (specify groups in "remarks"). Describe nature of impact				
• Tribal People (specify tribes in "remarks". Describe nature of impact				
• Minority groups (specify in "remarks"). Describe nature of impact				



ANNEX-5: IMPLEMENTATION ARRANGEMENTS

Implementation Arrangements

1. Considering the magnitude of the program, its urgency, its unprecedented geographic scope and the multitude of stakeholders to be involved, implementing the recovery and reconstruction program will pose an unprecedented challenge for the Government. The challenge will be to absorb, manage and disburse increased levels of funding while meeting higher expectations to restore lost assets and services. This challenge goes far above and beyond the challenges already posed by routine public service delivery. Factors such as the recent shifts in the governance paradigm resulting from the 18th Constitutional Amendment, inadequate public financial management capabilities, human resources constraints, complex intergovernmental coordination mechanisms add to this challenge. At the same time, concerns about accountability and transparency on the part of the public and the Government's development partners need to be addressed. It will take between six to ten years to complete the reconstruction program resulting from the DNA if the "business-as-usual" approach is applied, clearly an unacceptably long timeframe for the millions of people affected by the floods.

Institutional Framework

2. Having a clear institutional framework is essential for efficient and transparent delivery of the reconstruction portfolio. It also establishes Government commitment to the early commencement of the reconstruction process and credibility for mobilizing resources. The following key guiding principles should be considered while firming up the institutional framework:

3. ***Clarity of the overall mandates***. The mandates of the various levels of government will have to be in line with the 18th Constitutional Amendment. In accordance with this, the federal government is to take the lead in overall coordination and monitoring and formulation of reconstruction policies and strategies, necessary for equity considerations. The provincial and regional governments are to take the lead in implementation of the reconstruction program including coordination, policy, planning and monitoring at the provincial level.

4. ***Nodal agencies for reconstruction.*** In view of the existing capacity gaps and the stress created by the floods and related reconstruction in the institutions handling public sector programs, and the absence of dedicated institutional frameworks for flood reconstruction, additional capacities would be required to undertake the reconstruction functions. Nodal Agencies may need to be established at the federal and provincial/regional levels for this; the multi-sector nature of the reconstruction program and the multitude of institutions to be involved are further reasons to set up such Agencies.

5. ***Early articulation of policies, strategy and standards.*** The provincial and regional governments have already started articulating their responses, especially after the 18th Amendment and given the urgency of reconstruction; also depending upon their capacity. The federal government needs to ensure that the overall reconstruction policies and strategies are articulated as soon as possible to avoid inconsistencies and major divergence in reconstruction implementation among the provinces and regions.

6. ***Equitable allocation of resources.*** Floods have impacted the four provinces and various regions differentially depending upon location, topography and socioeconomic situation. This has given rise to diversity in the response and needs. The allocation of resources among provinces/regions has to be based on the needs and the associated disaster risks for reconstruction.

7. ***Setting a definite time frame for reconstruction implementation.*** Planning for reconstruction has been weak in the case of previous disasters in Pakistan. The federal government, in consultation with the provinces, needs to set a definite time frame for reconstruction implementation to install an emergency mindset within government institutions and reconstruction partners (multilateral and bilateral

institutions, and non-government organizations). The reconstruction implementation plan should take into account private and public sector capacities and systems and, in case of gaps, should include measures to fill these to complete the reconstruction program within the set time frame. Special policies, laws or special dispensations for reconstruction can then also be bound to this definite time frame.

8. ***Effective coordination*** **-** Effective coordination among all levels of government and reconstruction partners (government and donor agencies[91]) is essential and can best be achieved through national, provincial and district level coordination forums and sectoral coordination where required. These forums will facilitate information sharing, better planning and collaboration among the multiple partners as well as more targeted management of reconstruction resources.

9. ***Enhanced transparency*** **-** Independent oversight and monitoring involving representatives of civil society is essential to achieve transparency. The Government has put in place the first element to achieve this through the establishment of the National Oversight Disaster Management Council (NODMC) comprising independent and reputable individuals from civil society. The Government will also submit regular progress reports and the outcomes of the reconstruction M&E and audits to the NODMC. Enhanced disclosure on reconstruction policies, strategies, criteria, procurements and plans to the Pakistani and international community will need to be done through a pro-active program and strategic communications on reconstruction implementation, both at the federal and provincial levels. The expectations and information needs of the public, particularly the affected communities, should also be taken into account and any strategy to enhance transparency should be supported by a strong public awareness campaign, conducted at community level.

10. ***Implementation through existing government institutions as "first-choice" option.*** Implementation arrangements need to respect the mandate of existing institutions. Setting up parallel structures should be avoided to the extent possible. Existing institutions should be supported with additional capacity in order to deliver against the additional requirements and expectations associated with large-scale reconstruction programs.

11. ***Adoption of the subsidiarity principle.*** Reconstruction implementation responsibility should be delegated to the lowest level of government, to increase accountability and reconstruction outreach. However, implementation capacity should be strengthened where necessary through redeployment of existing government resources or by provision of external resources.

12. ***Enhanced Accountability.*** Enhanced fiduciary safeguards and risk mitigation measures, including internal controls and external audits, are to be adopted. The existing public sector financial management systems (PIFRA) should be used where possible, augmented by robust integrated FMIS to track reconstruction/donor funding. Additional internal control/audit staff may be required at the district or regional (division) levels to strengthen internal controls in the affected areas. All reconstruction programs and projects channeled through the government's budget systems may be audited by the Auditor General (AG) of Pakistan as the external auditor in conformity with the International Standards of Auditing. Given the urgency of the reconstruction programs a dedicated Audit Unit may be established within the AG office to carry out special performance audits and provide annual audit reports efficiently. Some of these activities could be outsourced by the audit department if required.

13. ***Institutionalizing fast-tracking.*** Procedures and systems to fast-track the reconstruction program especially for disbursements, procurement, and approvals should be institutionalized. In some cases procedures have been developed for emergencies but are rarely followed due to lack of capacity and

[91] Including NGOs.

reluctance on the part of implementing agencies unfamiliar with these procedures. The federal Nodal Agency could assist and technically back-stop mandated institutions to further elaborate and streamline the procedures for simplified projects and umbrella approval, public sector procurement, fund flow, and financial management. The fast-track procedures should be accompanied by clear systems, controls and instructions to minimize corruption and ensure accountability.

14. ***Incentivizing the human resource base.*** To break the "business as usual" culture of the institutions handling reconstruction, special incentives for staff working on reconstruction have to be introduced. Depending upon the role of the institution in the reconstruction, the incentives could be target-oriented and based on outputs. Return of government staff to the flood affected areas needs to be facilitated and incentive systems designed to attract and retain quality staff working under difficult conditions.

15. ***Full use of private sector capabilities.*** Private sector services and capacities are to be tapped where possible and appropriate. The additional capacities required in the short- to medium-term for reconstruction could also be outsourced so that government institutions can continue to perform their normal operations. The outsourcing could benefit from innovative options like turn-key (design-build) and public-private partnership models. Strict compliance with and efficient use of fast-track procurement and implementation procedures will incentivize the participation of capable and reputable consulting firms, contractors and suppliers in reconstruction implementation.

16. ***Enhancing community participation.*** Community participation in reconstruction implementation may be promoted and facilitated. Partnerships could be with individual households in the case of housing programs, and CBOs and NGOs to support implementation of community-based reconstruction approaches.

17. ***Socially responsive implementation.*** The existing legal system is already stressed and cannot efficiently handle the additional burden posed by reconstruction activities. A timely and effective response to grievances and complaints, both individual and institutional (in relation to delays, procurement etc.), needs to be ensured through the establishment of effective grievance redressal systems and complaints handling procedures. Ensuring timely redress will avoid delays in reconstruction implementation, as well as effectively protecting individual rights and entitlements. The system has to be supported by a monitoring mechanism to ensure its effectiveness.

18. ***Maintain social and environmental safeguards.*** While the reconstruction program calls for accelerated implementation, social and environmental safeguards need to be maintained. This will require social and environmental review and approval procedures to be adjusted in view of the nature and urgency of the reconstruction program and at the same time development/acquisition of additional capacities to undertake these reviews and implement and monitor safeguard plans.

19. ***Focusing on results.*** Monitoring and Evaluation (M&E) systems already exist at the provincial and federal level for public sector programs. However reconstruction programs, due to their urgency and multiplicity of donors, require real time segregated information. Internal and external M&E of reconstruction implementation will have to integrated with existing systems to address the information and monitoring needs resulting from the flood response. The focus of monitoring should be on the process and results, as well as the regular inputs and outputs.

20. ***Flexible implementation modalities for external reconstruction partners.*** To maximize mobilization of external resources, external partners are to be given the opportunity to support the reconstruction program based on their strengths and capacities but in conformity with the overall reconstruction needs, policies and strategies. While encouraged to adopt government delivery and on-budget systems,

external partners should be offered the possibility to provide reconstruction support through in-kind or direct implementation. The federal Nodal Agency will be the first point of contact for external off-budget donors and needs to keep track of all external resources to ensure their efficient use within the overall reconstruction context.

Outline Institutional Structure

21. Based on the guiding principles and taking into account the federal level institutional set-up and the mandates of the various institutions to be involved, the following outline institutional structure may be considered for flood reconstruction (Figure 5.1).

22. The Council of Common Interest (CCI) will provide the highest level of policy guidance to the federal and provincial/regional governments. The CCI will ensure the equitable allocation of reconstruction resources among the provinces and the regions, and resolve interprovincial issues related to reconstruction policy and implementation.

The recently established NODMC will provide the independent oversight of the reconstruction program. It will report its findings to the CCI, parliament, reconstruction partners and the public at large.

23. A Coordination Group will be established to review reconstruction implementation, discuss overall reconstruction policy and strategy aspects, resolve common issues faced by off-budget partners and assist in mobilizing additional external resources, if needed. As well as representatives of the key federal government ministries and representatives from the provinces and regions, the group may comprise representatives of the Government's major reconstruction partners.

At Federal Level

24. Considering their mandates, the following government institutions will be involved.

25. Existing approval forums will be responsible for review of all on-budget reconstruction programs. As a large number of such programs are expected to be submitted during the initial phase, additional dedicated capacity may need to be established to fast-track the review process during this phase. The approval forums would need to co-opt a member from the National Disaster Management Authority to ensure that disaster risk reduction (DRR) considerations are incorporated in the design of reconstruction programs, where appropriate. The Government may consider establishing a subcommittee exclusively for the reconstruction program which could have the delegated authority to approve reconstruction programs during the initial phase. The Government may also consider raising the approval authority of provincial/regional governments for reconstruction programs to fast-track the approval process, including simplification of the PC-I format for reconstruction. The relevant ministries of the government will have to for ensure that reconstruction is accorded high priority during the annual budget preparation process and the timely release of adequate counterpart funds during the course of the financial year in line with annual reconstruction work programs. Similarly additional resources may have to be provided in existing miniseries responsible for negotiating and concluding grant and loan agreements for reconstruction programs with external on-budget partners, to ensure timely availability of donor funding.

26. The Nodal Agency at federal level may have to be established for the coordination of off-budget reconstruction programs and the on-budget programs. Such a Nodal Agency could be the first point of contact for all the external on- and off-budget partners and will act as the Secretariat for the Government - Donor Coordination Group. The Agency would need to establish a database of all on- and off-budget programs. This will ensure synergy and complementarity between the two types of programs and the equitable allocation of overall reconstruction resources among provinces/ regions and among sectors. The Agency will monitor overall reconstruction implementation (on- and off-budget) and provide reg-

ular progress overview reports to oversight agencies like the CCI, the NODMC, the Government's reconstruction partners and the public at large. For this purpose, the Nodal Agency may need to establish a comprehensive M&E system in partnership with the Nodal Agencies at provincial/regional level, complementing the existing systems at federal/provincial/regional level.

27. The Nodal Agency will also assist in: (i) the formulation of reconstruction policies, strategies and standards, and (ii) the development/simplification of fast-track procedures for project approval, public sector financial management and procurement, in collaboration with the respective agencies mandated for approval of these activities by the Government. The Nodal Agency will be strengthened to undertake its reconstruction coordination, reporting, policy and M&E functions.

28. The Auditor General will be responsible for the audit of all on-budget programs as the external auditor in conformity with the International Standards of Auditing. Given the large size of the reconstruction program and the number of agencies that are likely to be involved, the AG may need to engage reputable private auditors to carry out the external audits on its behalf and also establish a dedicated unit for this within.

29. A number of federal authorities will be responsible for the implementation of reconstruction programs that fall under their respective mandates. These authorities include, among others, the National Highway Authority (NHA) and the Water and Power Development Authority (WAPDA).

At Provincial/ Regional Level

30. The institutional structure recognizes the lead role of the provincial and regional governments in reconstruction implementation based on the reconstruction policies and strategies issued by the federal government.

31. Each of the provincial/regional governments will establish a Reconstruction Committee to provide overall guidance and oversight at the provincial/regional level for the implementation of on-budget reconstruction programs. The Committee may include: (i) the Chief Minister (Chair), (ii) an opposition Member of the Provincial Assembly, and (iii) the Secretaries of the departments involved in reconstruction implementation.

32. A Provincial/Regional Government-Donor Coordination Group will be established to serve as a forum to coordinate the implementation of on- and off-budget reconstruction programs. The group will include representatives of the Planning and Development Departments (PDDs) and other relevant departments, a representative from the federal Nodal Agency and representatives of the reconstruction partners with major programs in the province/region.

33. The PDD will be the provincial/regional Nodal Agency and as such will be responsible for coordination of reconstruction implementation. It will ensure compliance with reconstruction policies and strategies across the various sectors. PDD will also ensure that fast-track procedures will be operationalized for reconstruction implementation.

34. The PDD will establish a dedicated Reconstruction Unit that will be the focal point for reconstruction planning and coordination, and M&E. The unit will act as the clearing house for reconstruction programs to be approved at Federal or the Provincial level. The Unit will also facilitate the participation of off-budget partners in reconstruction implementation provincially/regionally.

35. The existing provincial forums will approve the reconstruction projects submitted by the provincial

departments. A representative of the federal Nodal Agency will be co-opted in the approval forum at the provincial level to increase coordination and improve synergies. With regard to federally transferred funds, the provinces will have the authority to approve projects up to a threshold to be determined by the Government[92], including the possibility of unlimited delegated authority to approve subprojects under umbrella PC-Is approved at the federal level.

36. Line Departments will be responsible for the preparation of reconstruction projects in their respective sectors and implementation of these following their approval. Line Departments with a large reconstruction program may need to establish a dedicated reconstruction unit. Reconstruction implementation may need to be outsourced where departments lack the required resources.

37. The District Offices will be involved in small-scale local level reconstruction programs. They will also facilitate the implementation of off-budget reconstruction programs and establish a district-level coordination forum for this purpose.

Monitoring & Evaluation (M&E) System

38. **Background:** The demand for urgency, transparency and the need to be able to respond to the dynamic situation on the ground as the flood response develops, requires an effective M&E system in place at the outset. Monitoring is challenged by dispersed implementation across a range of sectors and the diverse information needs of multiple partner, donors, decision makers, general public, affected population and implementation agencies.

39. The Project Monitoring & Evaluation System (PMES) currently used at the federal Planning Commission captures the Public Sector Development program (PSDP) funded projects by the federation only - its basic point of reference is the PC-1 and annual plans. It is mainly used to monitor physical progress and fund allocation and use. It does not currently offer adequate connectivity to the provincial PSDP or donor funding. It is a web based program for which access is being slowly extended to all federal line ministries. The provincial M&E systems independent of the PMES also use PC-1 as a point of reference in their design. However the quality, extent and operation of these systems varies substantially between provinces. Almost all these systems are outside the public domain, and are not designed to capture any activity outside the PC-I. No qualitative data is being captured by these systems although some pilot work is ongoing under PMES. The only M&E system that has extended its boundaries to include multiple sources of funding, diverse information needs of multiple stakeholders and provides information to the general public has been designed by the Government of Punjab (GoPb).

M&E System for the Flood Reconstruction

40. Reconstruction activities have special M&E needs that are not necessarily aligned with PMES. The reconstruction programs are expected to be financed both on- and off-budget, by multiple sources of funds provided by multiple donors. There are reconstruction programs that are not PC-I based such as in housing and cash grants, and many others where in-kind support is being extended such as in agriculture and livestock. In addition an M&E system supported by an MIS in reconstruction provides information to coordinate the reconstruction activities between multiple agencies and also provides management information for efficient decision making. Similarly reconstruction information and reporting has to be efficient to facilitate delivery in short timeframes; this requires multiple access and control of the systems.

41. It is important that reconstruction requirements do not undermine but supplement and strengthen existing M&E systems, without overloading them with activities that may not go beyond the reconstruction phase. Based on these consideration the Government may consider a two-pronged strategy for M&E:

[92] The PDWP has the authority to approve projects of unlimited amounts from the provincial funds.

a) strengthening PMES, by consolidating existing requirement and adding modules that are common to reconstruction and the future needs of the system; and b) develop an M&E/MIS capturing the reconstruction requirements not served by existing and future needs of the PMES, with a well developed interface in case of future disasters.

42. The model developed by Punjab serves as a very good starting point but this will have to be reviewed in the context of the multiplicity of requirements in sectors/themes and players whose information needs have to be met. All provinces and regions may not have the same technical capacity, so the system design and its use has to take account of these limitations. The recommended approach is to start with a basic system, and build this up incrementally once it starts operating.

43. The attached line diagram shows the monitoring responsibilities at different levels. The M&E system for reconstruction may be developed at the federal Nodal agency level. Implementation would take place at different levels, for which additional capacities and training would have to be provided at the relevant levels of the provinces, districts and off-budget donors to operate such a system.

Figure Annex 5.1: Suggested Reconstruction Policy, Strategy and Implementation Coordination Mechanisms

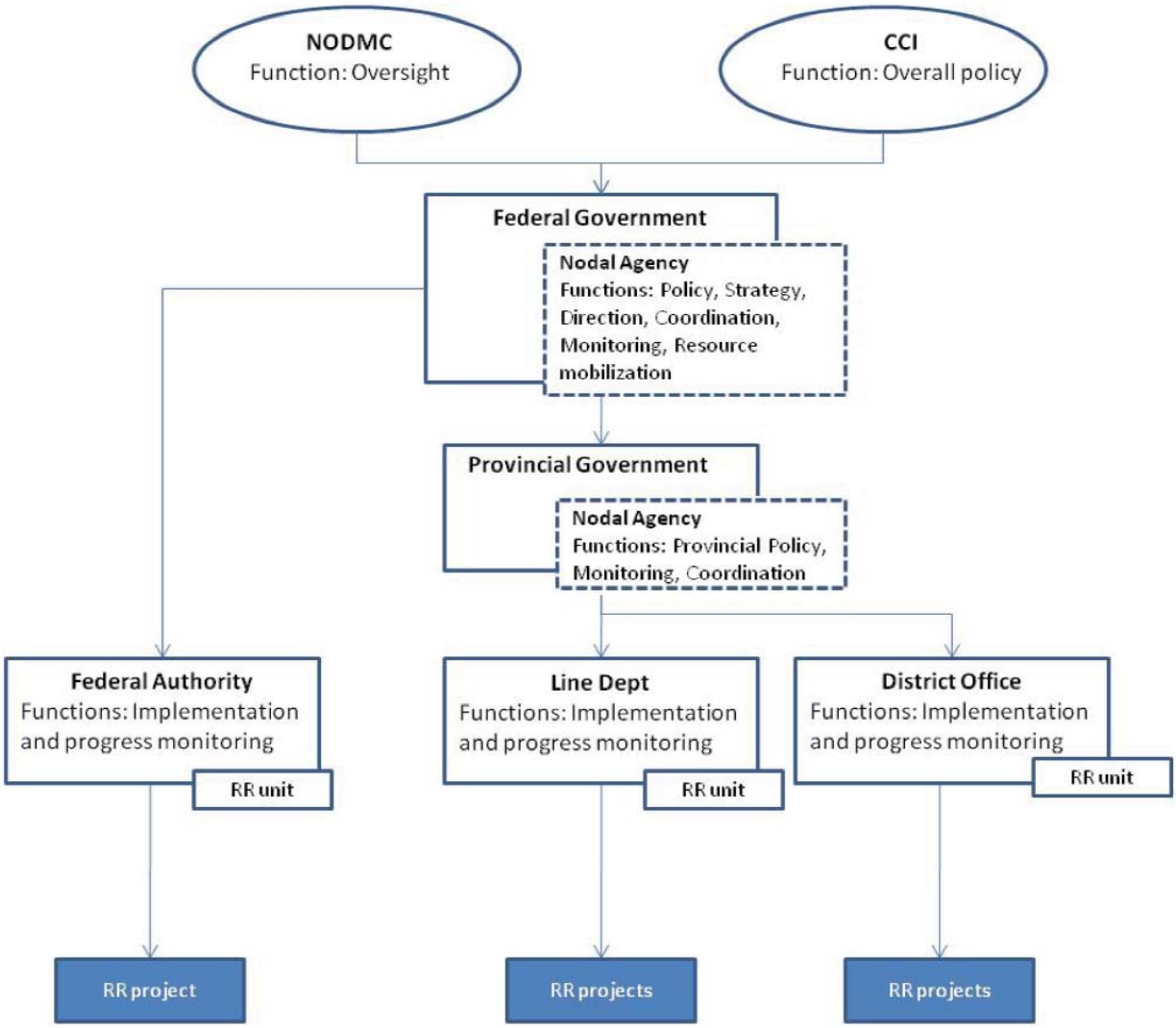
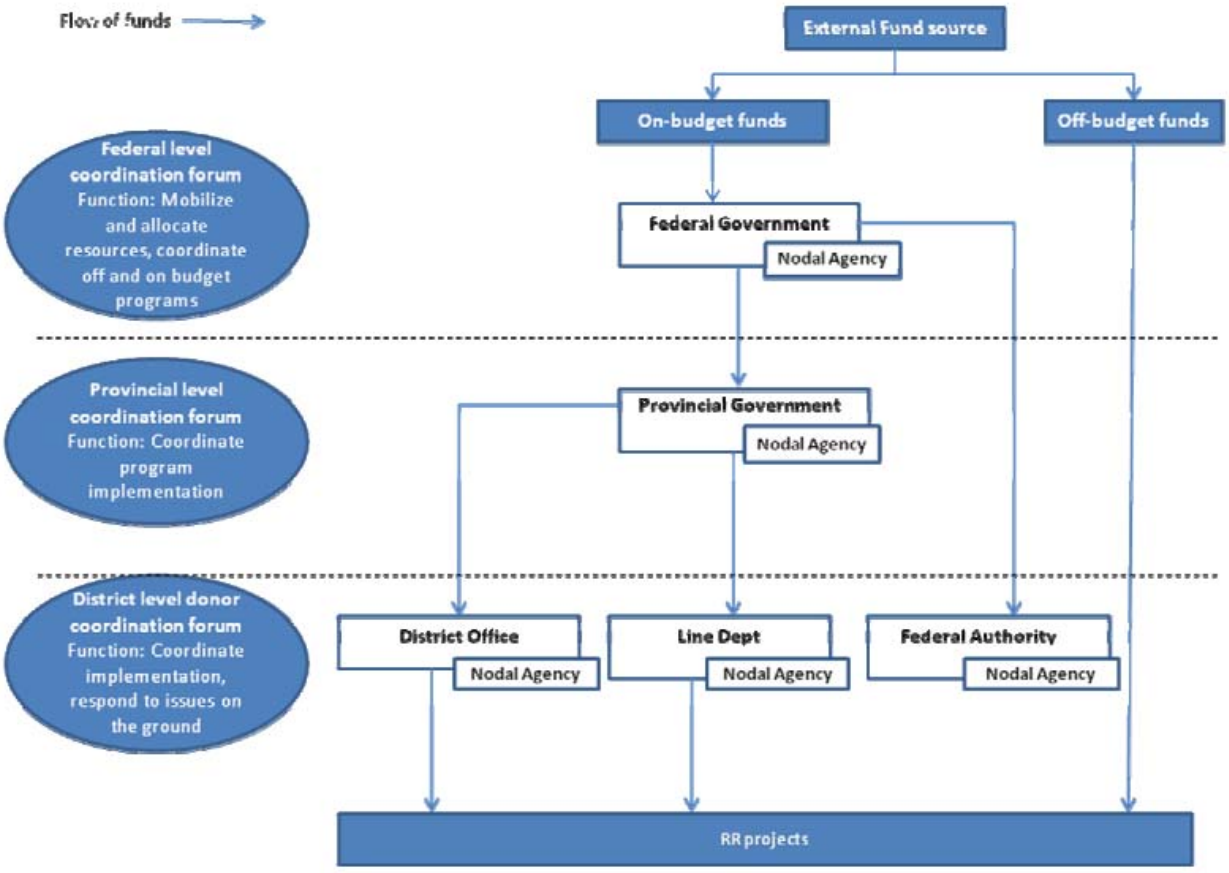


Figure Annex 5.2: Suggested flow of funds and coordination mechanisms



ANNEX-6: HOUSING

Picture source: UN HABITAT

Background

1. ***State of Sector Prior to Disaster:*** The 2010 floods have resulted in massive damage to private housing. A typical affected house in rural Pakistan consists of one or two rooms, an animal shed, storage area, silos for grain, space for open cooking, and a latrine and washing area which are generally without roof, with 4-5 feet high walls. The average size of a housing unit varies across the country, between an average of 1.7 rooms (381 sq. ft.) in Sindh and 3.2 rooms (697 sq. ft.) in AJK, and an average household comprising 6.8 persons. Most of the affected houses are of *katcha* (non/semi-permanent) type construction, which is the predominant type in rural areas. *Pucca* (permanent) type construction is found in some rural and most urban affected areas. Virtually none of the houses in the affected areas has been designed for flood-resistance. Compounding this is the fact that a portion of the affected area lies in a high seismic zone.

2. ***Baseline Housing Stock:*** The pre-flood baseline housing stock for the **affected districts** has been estimated by applying district-wise inter-censal (1981-1998) housing growth rates to the housing stock as reported in the 1998 Census data. In the case of Sindh however, application of the district/*tehsil*-wise population growth rate was deemed more appropriate. The baselines so developed were disaggregated into *katcha* and *pucca* categories using the district-level *katcha/pucca* housing proportion also inferred from the 1998 Census.

3. According to the estimated baselines, there were **12.34 million** housing units in flood affected districts in all seven regions of the country. Of these, 5.32 million units were pucca (43 percent) while 7.02 million units (57 percent) were *katcha*. This proportion varies significantly across and within provinces, from 87 percent *katcha* prevalence in affected districts of Balochistan to 42 percent in affected districts of AJK. Moreover, they are exposed to a variety of natural hazard risks in different combinations (flood; earthquake; landslide) making *one-solution-fits-all* reconstruction inappropriate and unnecessarily costly if risk resistant standards are to be adopted. This alludes to the need for differential and localized (district-level) housing reconstruction solutions.

Table-Annex-6.1: Housing - Baseline Housing Stock in Flood Affected Districts

Province/Region	*Pucca*	*Katcha*	Total	% *Pucca*	% *Katcha*
AJK	304,314	217,970	522,284	58%	42%
Balochistan	74,959	498,219	573,178	13%	87%
FATA	156,039	268,806	424,845	37%	63%
Gilgit-Baltistan	91,187	67,053	158,240	58%	42%
Khyber Pakhtunkhwa	1,560,350	1,201,561	2,761,911	56%	44%
Punjab	2,119,177	2,163,416	4,282,593	49%	51%
Sindh	1,016,662	2,599,191	3,615,854	28%	72%
Total	**5,322,688**	**7,016,217**	**12,338,905**	**43%**	**57%**

Damage Overview

4. The floods caused total or partial damage to more than **1.6 millio**n housing units across the country. An estimated **913,307** houses have been completely destroyed[93] and another **694,878** suffered partial

[93] This primarily includes completely washed away, fully collapsed, or structurally damaged houses with foundation failure or erosion of supporting walls

damage[94]. Across provinces, the housing stock in Sindh has been the worst affected, with almost 880,000 housing units completely or partially damaged, which is 55 percent of the total affected housing stock.

5. ***Characteristics of Damage to Katcha and Pucca Houses:*** As expected, the extent of damage incurred to *katcha* houses has been far higher with 19 percent of the total *katcha* housing stock affected (1.45 million housing units), and 847,455 housing units completely destroyed. By contrast, only 3 percent of total *pucca* housing stock (156,000 housing units) suffered damage, with about 65,000 being completely destroyed. In general, pucca houses have performed better when affected by standing water, but have been vulnerable to flash flooding which has undermined foundations, and scouring/erosion at the base of walls and corners. Standing water, on the other hand, has subjected submerged portions of walls to hydraulic pressure, often causing walls to overturn or tilt laterally. At places subsidence of the ground under water-logged foundations has resulted in cracking and collapse of walls. For *katcha* buildings, the impact has often been extreme and irreversible. In some areas, excessive rainfall caused roofs to collapse. However, houses affected only by direct rain are generally in a repairable condition. In mountainous areas, heavy rains also triggered landslides which have caused heavy structural damage to housing. In the plains, erosion of river banks has undermined foundations with a similar affect.

Table-Annex-6.2: Housing - Consolidated Damage Details (Number of Houses)

Province/ Region	*Pucca*			*Katcha*			TOTAL			% of pre-flood stock
	CD	*PD*	*Total*	*CD*	*PD*	*Total*	*CD*	*PD*	*Total*	
AJK	541	2,316	2,857	1,090	2,896	3,986	1,631	5,212	6,843	1%
Balochistan	800	1,500	2,300	73,724	3,696	77,420	74,524	5,196	79,720	14%
FATA	0	0	0	1,241	4,178	5,419	1,241	4,178	5,419	1%
Gilgit-Baltistan	0	0	0	3,157	0	3,157	3,157	0	3,157	2%
Khyber Pakhtunkhwa	4,107	8,282	12,389	90,605	154,300	244,905	94,712	162,582	257,294	9%
Punjab	4,050	8,127	12,178	123,572	240,024	363,595	127,622	248,151	375,773	9%
Sindh	56,353	70,441	126,794	554,067	199,118	753,184	610,420	269,559	879,978	24%
National Total	**65,851**	**90,666**	**156,517**	**847,455**	**604,212**	**1,451,667**	**913,307**	**694,878**	**1,608,184**	**13%**

CD = Completely Destroyed; PD = Partially Damaged

6. Overall, 13 percent of the total housing stock in the flood-affected districts has been impacted. In Sindh, this is around 24 percent relative to the pre-flood baseline of the affected districts. This is followed by Balochistan at 14 percent, and Punjab and KP with 8-9 percent. Within provinces, some districts have borne a greater brunt.

Means of Validation

7. Primary data on damage to housing stock from the seven provinces/regions has been validated using various techniques for quantitative and qualitative rationalization. Data sources for validation include

[94] This mostly includes cases of roof damage and repairable damage to walls, etc.

satellite imagery-based data from SUPARCO, UN Habitat and WFP field assessment reports, and sample-based field visits by the DNA Housing Team. In all cases except Sindh and Punjab, data provided and officially notified by the provincial/regional government entities has been taken as a starting point for damage analysis.

8. ***Determination of Damage to Katcha and Pucca Houses:*** Generally, data shared by the Government was not disaggregated between damage to *katcha* and *pucca* houses, which is critical to estimate the monetary value of damage, losses, and reconstruction needs. Information from the UN Habitat qualitative assessment was used to establish predominant construction types in various affected areas, and the likelihood of damage extent to each. These probabilities have then been applied to total damage data as reported by government entities, to estimate the number of houses completely destroyed and partially damaged, within *pucca* and *katcha* types, on a district level. This provided disaggregated damage data for *katcha* and *pucca* types, further divided into categories of completely destroyed and partially damaged. Furthermore, provincially notified damage to education and health facilities, which are invariably *pucca* construction, have been used to compare damages to pucca houses.

9. ***Validation through Remote-Sensing Data:*** Satellite data from SUPARCO included: area inundated within each district; estimated number of settlements within the inundated area; and information on duration and characteristics of inundation. This data has been used to validate and rationalize damage estimates on a district, and in some cases *tehsil/taluka*, level - particularly in Sindh.

Damage and Loss Quantification

10. ***Direct Damage Estimate:*** The term 'Damage' refers to the loss in depreciated monetary value due to structural damage to the housing stock caused by the floods. The damage costs for a typical house vary across the country depending upon the severity of damage, size of house, type of construction, and the age of the housing unit. A detailed model was developed for the assessment using differential rates for pucca and *katcha* housing types standardized across provinces. This model helped estimate the average unit reconstruction cost for each area. Based on the 1998 Census data, the average number of rooms in a typical house, averaged across all districts in each province, has been used to calculate average unit size for each province. The cost of a typical *katcha* and pucca house has been estimated using construction costs collected from field visits by The World Bank housing team as well as desk estimates. Reconstruction of a katcha house to pre-flood standards is estimated to cost PKR 200 per sq. ft and a pucca one at PKR 560 per sq. ft.

11. Damage to partially damaged houses, considered repairable, are assumed to be 40 percent of damage to an equivalent completely destroyed house. Finally, depreciation factors have been determined for each province/region using Census 1998 data for the average age of housing units. Using the above model, the total costs for direct damage for partially damaged houses is estimated at **US$ 285 million**, and for completely destroyed houses at **US$ 795 million**, giving a total direct damage cost of **US$ 1,081 million.**

12. ***Loss Estimate:*** The value of losses covering: (a) damage to household goods and assets estimated as a proportion (15 percent) of the value of housing unit as well as the estimated value of lost appliances based on the available statistics[95]; (b) estimated damage to household water and sanitation facilities based on representative data[96]; and (c) costs of debris removal and provision of temporary shelter, as prescribed by the UN-ECLAC methodology have also been calculated. The cumulative value of indirect housing sector losses is estimated at **US$ 508 million**, including: (a) **US$ 310 millio**n in house-

[95] Census of Electricity 2005-06
[96] Pakistan Social and Living-Standard Measurement (PSLM) Survey 2006-7

hold goods and assets, **US$ 53 million** in damage to household water and sanitation facilities (for a total of US$ 363 million); (b) **US$ 32 million** for demolition and debris removal; and (c) **US$ 113 million** for provision of temporary shelter.

Table-Annex-6.3: Housing - Depreciated Value of Damage and Losses to Housing Sector (US$ Million)

Province / Region	Value of Housing Stock (Direct Damage)			Value of Assets & Equipment	Value of WATSAN infrastructure	Debris Removal Costs	Temporary Shelter Costs	Total Indirect Losses	Total Damages & Losses
	CD	PD	Total						
AJK	3.2	4.6	7.8	1.2	0.2	0.1	0.3	1.8	9.7
Balochistan	65.0	2.7	67.7	18.5	1.0	1.9	7.8	29.1	96.8
FATA	1.1	1.4	2.5	0.7	0.1	0.1	0.2	1.0	3.5
Gilgit-Baltistan	3.9	0.0	3.9	0.8	0.0	0.1	0.3	1.2	5.1
KPK	96.6	67.2	163.8	37.8	5.6	4.0	14.3	61.7	225.5
Punjab	125.7	97.9	223.6	54.7	18.4	5.6	20.1	98.8	322.4
Sindh	499.8	111.3	611.2	196.2	28.1	19.9	70.1	314.3	925.4
National Total	**795.3**	**285.2**	**1,080.5**	**309.9**	**53.3**	**31.6**	**113.1**	**507.9**	**1,588.4**

CD = Completely Destroyed; PD = Partially Damaged

Proposed Housing Recovery and Reconstruction Strategy

13. The suggested recovery and reconstruction strategy comprises a variety of activities to assist households to be re housed in permanent housing. The predominant form of suggested assistance is cash grants for owner-driven rebuilding - a mode well suited to the predominantly rural affectees, and already being used by the Government for immediate assistance. This would be responsive to individual preferences and maximize household ownership thereby keeping expectations of, and demands on, government realistic. It would mobilize self-standing reconstruction and rehabilitation efforts primarily at the level of the affected households, thereby not burdening government administrative capacity with a large volume of contract management. The objective of the reconstruction grant would be to replace a destroyed house with a new core unit, preferably of multi-hazard resistant standards. Alternatively, a repair grant would help restore structurally damaged portions of houses to a livable state.

14. Urgent attention to beneficiary identification and eligibility levels is required, and assistance packages need to be standardized into a few well-defined categories. The strategy also recognizes the need for extended-term intermediate sheltering options for households that will need to be relocated from areas that are severely hazard-prone. Although permanent relocation will require time, replacement site identification and re-planning are short-term priorities. Priority also needs to be given to zoning of the affected area for the various types of natural hazard risks, to enable application of appropriate engineering design solutions. The post-earthquake housing reconstruction program, substantially implemented over 2006-09, achieved impressive results and provides valuable lessons and the strategic underpinnings for developing a post-floods housing reconstruction program, with appropriate adjustments.

The proposed policy principles are:

- Ensure rebuilding is owner-driven.
- Rebuild in-situ as far as possible, but relocate settlements away from high-risk areas.
- Offer equitable assistance packages that are not compensation-based for core units, but have differentials based on applicable natural hazard risks.

- Adopt and promote use of cost-effective, hazard-resistant engineering designs and reconstruction standards.
- Rebuild with easily accessible materials reflecting cultural preferences.
- Ensure consistency of policy principles and strategies across provinces, and a centrally coordinated policy framework, monitoring and standards for equity.
- Route housing grant disbursements through the provinces.
- Undertake detailed Damage Assessment and Eligibility Verification survey based on uniform technical criteria to ensure consistency across affected areas.
- Require uniformity of implementation approach across funding sources/partner organizations.
- Sign MOUs with beneficiaries to ensure judicious use of grants (for the purposes intended) and adherence to applicable hazard resistant standards.
- Require assisted, inspected, and certified tranche-based disbursement of reconstruction assistance linked to stages of construction, and adoption of applicable hazard-resistant standards.
- Ensure consistency and complementarity between early recovery and permanent housing solutions.
- Establish participatory and inclusive information management and grievance redressal systems.

15. ***Costed Strategic Options:*** Since the affected area is prone to multi-hazard risks (floods, earthquake, and landslide), reconstruction of houses should be based on appropriate cost-effective, hazard-resistant engineering standards as far as possible. While this approach will increase initial costs of reconstruction to some extent, it will constitute the most economically efficient solution when viewed over the full useful life of these investments.

16. Locations vulnerable to flooding have been identified using district level satellite imagery data and detailed Indus River flood plain maps at a scale large enough for settlements to be clearly identifiable. These provide the basis for calculating the number of dwellings exposed to five-year and fifty-year flooding risk. A significant part of the affected housing stock (223,000 houses; 24 percent of completely destroyed housing stock and 14 percent of total affected houses) is situated within the fifty-year flood plain of the Indus River, adopted as the flood hazard area for the purpose of this report. Such housing, if reconstructed in situ, with the same materials (mainly mud) and to the same standards as before, remains at significant risk during its useful life. This risk is even greater for houses located within the five-year flood plain (very high flood risk area). Each time a flood occurs the Government spends substantial amounts in providing assistance and subsidies. Moreover, with climate change, the frequency and magnitude of flooding is predicted to become more severe than in the past.

17. Given the large number of houses located within this area, it is not practically possible to relocate them all to safer locations outside this area.[97] However, it is strongly recommended that the Government require the adoption of flood-resistant engineering designs and construction standards as a condition for disbursement of the reconstruction grant to all eligible affectees living within the flood hazard area (fifty-year flood plain). This option has been costed for the purpose of this report. However, houses located in the five-year flood plain will need to be relocated outside it. Similarly, in areas that are prone to significant seismic risk (Seismic Zones 2B, 3 and 4 according to the Building Code of Pakistan 2007), housing reconstruction needs to cater for appropriate seismic-resistant standards, to minimize the risk to life and property, and to reasonably secure the proposed investments over their useful life. Housing made of *katcha* construction is not recommended in such areas, since significant seismic resistance cannot be ensured for such construction.

[97] However, it is strongly suggested that the housing units located within the five-year flood plain (very high flood risk area) be relocated to a safer area, as a condition of reconstruction assistance.

18. ***Estimated Needs for Permanent Housing Reconstruction:*** The reconstruction and repair needs for housing have been calculated for the three options explained below. They range between **US$ 1.483 and 2.206 billion**. These estimates are based on replacement of a destroyed house with a core unit of 500 sq.ft covered area, calculated on the basis of currently prevailing prices of materials and labor.

Table-Annex-6.4: Housing - Summary of Reconstruction Cost Options

Reconstruction Options	Pros and Cons	Reconstruction / Repair Costs US$ million
Option-1 (Base Case Scenario) - **Uniform Subsidy for Building-as-Before** calculated on the basis of a *katcha* core unit. Subsidy of **PKR 100,000** for reconstruction; **PKR 50,000** for repairs.	**Not Recommended:** Cheapest but **sub-optimal** option from engineering/ disaster risk reduction perspective	**1,483**
Option-2; **Partially Differential Subsidy** - providing for restoration to **flood-resistant** standard for units located within the flood hazard area. Subsidy of **PKR 180,000** for reconstruction of flood-resistant **hybrid** house; **PKR 50,000** for repairs.	**Recommended for Punjab & Sindh only**: Caters to flood risk- but not seismic-risk in applicable areas	**1,690**
Option-3; **Differential Subsidy for BBB** - Option-2+premium to build to multi-hazard-resistant standard for units at risk of flood and earthquake. Subsidy of **PKR 415,000** for reconstruction of flood & seismic resistant ***pucca*** house; **PKR 50,000** for repairs.	**Recommended Option:** providing optimal balance between affordability and BBB	**2,206**

19. ***Option-1; (Base Case) - Uniform subsidy for Building-as-Before:*** The base case assumes provision of a uniform subsidy equivalent to the amount required to construct a core *katcha* unit. It implies a standardized cash grant of PKR 100,000 (approximately US$ 1,180) to each household whose dwelling was completely destroyed, and PKR 50,000 (approximately US$ 590) to each household for repairs of dwellings partially damaged. It does not cater for the prevalent risks of recurrent flooding, earthquake, or landslides in much of the affected area, and is costed only for comparison purposes. Since it puts all future investment that will go into housing reconstruction at risk, it is a sub-optimal use of scarce public resources, and **is not recommended.**

20. ***Option-2; Partially Differential Subsidy (Flood Premium):*** This option provides for restoration to flood-resistant standard for units located within the flood hazard area. It offers a subsidy of PKR 180,000 (US$ 2,120) including a flood premium of PKR 80,000, for reconstruction of a flood-resistant hybrid house in flood hazard areas only. It consists of pucca construction of foundations and plinth (burnt brick, concrete block or stone masonry, set in cement-sand mortar), raised to an average six feet height, with a *katcha* (adobe or mud wall) superstructure. The subsidy for units outside these areas remains PKR 100,000.

21. The Reconstruction Grant will be released in two tranches: (i) an advance payment; and (ii) as second payment after completion and certification of construction up to plinth level. All partially damaged units will continue to be eligible for PKR 50,000 for repairs, since existing structures cannot be repaired to flood-resistant standards. Extensive GIS data made available by the Federal Flood

Commission and SUPARCO was utilized to calculate the number of houses in Punjab, Sindh, and KP that were situated within the five- and fifty-year flood plains of the Indus for the purposes of this assessment. This option is generally **recommended for the flood-affected areas of Punjab and Sindh only**, which are predominantly not at seismic risk.

22. ***Option-3; Differential Subsidy for Building Back Better (Flood & Seismic Premium):*** This option is based on the view that damage caused by the floods provides an opportunity to build using flood- and seismic-resistant standards for units in areas prone to such hazards. It provides a differential subsidy based on seismic and flood risk. It is suggested that completely destroyed houses located in significant seismic risk zones be provided a subsidy of PKR 350,000 (approximately US$ 4,120), and units located in significant seismic risk as well as flood hazard zones be provided a subsidy of PKR 415,000 (approximately US$ 4,880). Since *katcha* construction cannot be made seismic-resistant, it is not recommended for areas that are vulnerable to earthquakes. All partially damaged units will continue to be eligible for PKR 50,000 for repairs, since existing structures cannot be repaired to hazard-resistant standards. This is the **recommended option** for implementation of a comprehensive housing reconstruction program across the affected areas in the entire country.

23. For both premium options, a detailed Damage Assessment and Beneficiary Eligibility Survey will be required to identify the exact number of houses eligible for a reconstruction grant that includes a flood, seismic, or both premiums. Since the amounts of the proposed reconstruction subsidies have been calibrated on the basis of a *katcha* core unit, owners of pucca houses that have been completely destroyed will find the proposed subsidy for the base case quite inadequate. While it cannot be varied for reasons of equity, it is recommended that the Government try to facilitate access to housing loans through existing financial institutions for creditworthy house owners within this category.

Table-Annex-6.5: Housing - Costed Reconstruction Options (PKR million)

Province / Region	Option 1 - Base Case			Option 2 - Flood-resistant			Option 3 - Multi-Hazard Resistant		
	Recons-truction	Repair	Total	Recons-truction	Repair	Total	Recons-truction	Repair	Total
AJK	163	261	424	163	261	424	571	261	831
Balochistan	7,452	260	7,712	7,452	260	7,712	26,083	260	26,343
FATA	124	209	333	124	209	333	434	209	643
Gilgit Baltistan	316	0	316	316	0	316	1,105	0	1,105
Khyber Pakhtunkhwa	9,471	8,129	17,600	9,709	8,129	17,838	33,387	8,129	41,516
Punjab	12,762	12,408	25,170	18,647	12,408	31,055	18,647	12,408	31,055
Sindh	61,042	13,478	74,520	72,520	13,478	85,998	72,520	13,478	85,998
TOTAL (Million PKR)	**91,331**	**34,744**	**126,075**	**108,931**	**34,744**	**143,675**	**152,748**	**34,744**	**187,491**
TOTAL (Million USD)	**1,074**	**409**	**1,483**	**1,282**	**409**	**1,690**	**1,797**	**409**	**2,206**
Premium over Base Case			*100%*	*0*	*0%*	*114%*	*0*	*0*	*149%*

CD = Completely Destroyed; PD = Partially Damaged

24. A further breakdown of physical damage and cost estimates by category of premium suggested is provided below for units to be reconstructed. In Option-2 (with flood premium), approximately 223,000 units are eligible for flood-resistant reconstruction grant. Similarly, in Option-3 (with flood and seismic risk premium), only 3,000 units are eligible for both premiums and about 518,000 are not eligible for any premium. In terms of cost, this implies that US$ 15 million (out of a total reconstruction cost

of US$ 1.797 billion) will go towards rebuilding houses that are multi-hazard risk-resistant, with the remainder being allocated to the other three categories as shown.

Table-Annex-6.6: Housing - Physical Damage and Reconstruction Costs by Premium Category

Descriptions	Option 2 - Flood-resistant			Option 3 - Multi-Hazard Resistant				
	Flood premium	Base case (no hazard)	Total CD	Flood & seismic premium	Only seismic premium	Only flood premium	Base case (no hazard)	Total CD
Number of CD Houses per category	223,000	690,307	913,307	3,000	172,265	220,000	518,042	913,307
Reconstruction Cost per category (US$ million)	469	812	1,282	15	709	463	609	1,797

CD = Completely Destroyed

*NB: The table **does not reflect cost of repair to partially damaged houses**, as these are not eligible for flood or seismic premiums.*

Development of Unit Rates for Reconstruction: Since the damaged housing stock is spread across the country, considerable geographical variations were observed for types as well as prices of preferred construction materials. The estimation of unit reconstruction rates for the housing options considered for estimating 'needs' has involved the use of a unit cost housing model, designed and tailored by the DNA housing team for owner-driven rather than contractor-driven reconstruction. The reported prices of basic construction inputs obtained from various credible sources have been fed into this model for developing the damage and needs scenarios presented.

Priorities for Recovery and Reconstruction

- ***Information Dissemination*** shall be a crucial part of the Government's strategy. This should include information on the full range of assistance options, their eligibility criteria, and the means of accessing them, as well as improved construction methods for hazard-resistant houses.
- ***Detailed Damage Assessment and Eligibility Verification Survey*** is an urgent task, and needs to be undertaken using uniform technical standards, to ensure transparent eligibility verification.
- ***Flood, Earthquake, and Landslide Risk Investigation*** studies need to be undertaken to identify land susceptible to future natural disasters like recurrent flooding, earthquakes, landslides, and erosion.
- ***Developing Appropriate Hazard-resistant Engineering Design Options:*** Since different parts of the affected area are prone to one or a combination of hazard risks, developing cost-effective engineering design solutions for each combination of hazards should be a priority.
- ***Training for Safe Construction*** for artisans, contractors, home-owners, and construction supervisors should be an integral part of the Government's reconstruction strategy. This should be initiated as soon as possible, and housing assistance needs be tied to the adoption of the improved construction practices.
- ***Recycling Materials from Debris*** will reduce reconstruction costs and have a positive environmental impact. Communities need to be educated on optimal reuse of materials from housing debris.
- ***Community Mobilization*** will be needed to ensure information dissemination, better construction methods/skills training, mutual support and oversight. Moreover, vulnerable-headed eligible households will need special attention and assistance via such mechanisms.
- ***Availability of Construction Materials*** during the reconstruction phase will be critical, particularly with the compounded needs of multiple sectors. Special efforts will be needed such as setting up of construction material hubs throughout the affected areas.
- ***Settlement Planning and Development*** should be reviewed in light of the possibility of introducing

flood protection measures for entire communities in areas prone to risks of recurrent flooding. Protective measures for entire communities, such as the construction of levees (earthen embankments), offer optimal use of resources, enabling engineering standards for individual buildings to be lowered.

- ***Appropriate Implementation Arrangements for Housing Reconstruction*** are needed, in particular that are: (a) owner-driven; and (b) predominantly rural. The successful post-2005 earthquake rural housing reconstruction program offers a most useful precedent.

Follow-up Actions Required for Housing Sector

i. **Focus on federal-provincial dialogue** to harmonize provincial strategies and plans for housing reconstruction along the proposed policy parameters.
ii. **Develop consensus on roles:** (a) for **central (federal) coordination, monitoring, and standard setting** for equity, and (b) provincial level implementation.
iii. Explore the potential of introducing **urban housing loans and rural microfinance** through existing mechanisms, for providing supplementary support to creditworthy house owners.
iv. Develop incentivized **community protection approaches and programs** to ensure greater disaster (flood) risk reduction for communities at high risk of recurrent flooding. This could include the introduction of community level protective infrastructure such as bunds, spurs, and dykes. (Note: In case of some communities prone to significant flood risks, it may be more cost-effective to reconstruct individual houses to the base standard, and collectively use the proceeds of the eligible flood risk premiums to finance community level protective infrastructure.)

Table-Annex-6.7: Housing - Prioritized Sector Recovery Framework/Timeframe

Activity	Short-term 12 months[98]	Medium- and Long-term
Detailed Damage Assessment & Eligibility Verification Surveys	213	-
Communications, Community Mobilization and Trainings	510	340
Administrative and Implementation Costs	1,275	1,275
Reconstruction and Repair of Houses	-	187,491
Total (PKR million)	1,998	189,106
Total (US$ million)	24	2,225

[98] There activities do not overlap or duplicate activities under the UN early recovery program. Close coordination in this respect has been maintained with the UN Habitat and IOM.

ANNEX-7: HEALTH

Gerhard Juren

Background

1. In order to assess the damage and needs of the health sector in the affected areas, a preliminary assessment was carried out by a team comprising sector specialists from ADB and World Bank with technical assistance provided by WHO, KfW, and GTZ.[1] The purpose of this report is to document damage caused to the health sector, and outline short-, medium- and long-term recovery needs and the strategy for the sector.

2. According to government reports, as of 8 October 2010, 1,961 people lost their lives and 2,907 were injured [Punjab 110 dead and 262 injured; Sindh 293 dead and 1,202 injured; Khyber Pakhtunkhwa (KP) 1,156 dead and 1,198 injured; Balochistan 48 dead and 98 injured; AJK 71 dead and 87 injured; and Gilgit Baltistan (GB) 183 dead and 60 injured]. The calamity marooned around 20 million people, affecting over 1.87 million houses[2]. At least five districts of Punjab, six districts of Sindh, five districts of KP, and four districts of Balochistan have been severely affected. A large number of people, women and children being particularly vulnerable, are still living in scattered roadside camps without potable water.

3. Communicable diseases account for a significant percent of the total burden of diseases (BOD). From 29 July to 24 September, approximately 6,243,723 patient consultations have been reported to the disease early warning system (DEWS) by 903 fixed and 417 mobile health centers established in the four flood affected provinces. The major causes for seeking health care in these centers were diarrheal diseases (13 percent), acute respiratory infections (15 percent), skin diseases (18 percent), and suspected malaria (3 percent). Child, infant and maternal mortality remains high in Pakistan and the rate of improvement has been slow. Some of the key health indicators are given in the table below:

Table-Annex-7.1: Health - Key Health Indicators

District	Maternal Mortality Ratio (per 100.000 Live Births -LB)	Infant Mortality Rate (per 1,000 LB)	Immunization Rate (%)	Contraceptive Prevalence Rate (%)
Balochistan	856	49	35	14
Khyber Pakhtunkhwa	323	63	47	25
Punjab	238	81	53	33
Sindh	333	81	37	27
Pakistan	**297**	**78**	**46**	**29.6**

Source: PDHS, 2007

Flood Damage Overview

4. The reported damage to primary public health infrastructure including basic health units (BHUs) and dispensaries has been mild to moderate. Most of the secondary health care facilities remained unaffected. No health staff were reported to have died or been injured. The 2010 floods covered significant parts of the country and mostly rural areas were affected. Of the total of 9,721 health facilities

[1] The Health Sector Team comprised Munir Abro, Team Leader/ADB, Nargiza Talipova, Member/ADB, Michel Yao, Member/WHO, Tayyab Masud, Member/WB, Matthias Reinicke, Member/KfW, and Lundy Keo, Member/GTZ.
[2] Situation Report dated 8 October 2010 posted on the official website of National Disaster Management Authority (NDMA): http://ndma.gov.pk/

country-wide, 515 facilities (5.3 percent) were damaged of which 186 facilities (1.9 percent) were completely damaged and 329 facilities (3.4 percent) partially damaged. Sindh sustained the largest damage followed by KP. Damaged BHUs and dispensaries constituted 86 percent of the total number of damaged facilities; the remainder were damaged RHCs (10.8 percent), THQs (3,2 percent) and two DHQs. Table 2 below shows the province/region-wise number of damaged health facilities as a percentage of damaged health facilities in the affected districts and as a percentage of the total health facilities in the province/region.

Table-Annex-7.2: Health - Overview of Damaged Health Facilities

Province/Region	Total health facilities of all categories	Number of damaged health facilities			Affected facilities as % of province total
		Completely damaged	Partially damaged	Total	
Azad J. Kashmir	616	6	33	39	6.3
Balochistan	2,075	26	19	45	2.10
FATA	364	0	30	30	8.24
Gilgit-Baltistan	731	2	1	3	0.41
Khyber Pakhtunkhwa	1,739	40	150	190	10.9
Punjab	2,891	9	48	57	2
Sindh	1,305	103	48	151	11.65
Pakistan	**9,721**	**186**	**329**	**515**	**5.29**

5. A large number of people are still living in scattered roadside camps without potable water, as many humanitarian aid agencies with their limited resources find it hard to meet the basic needs of the affected people, and fears of water-borne diseases loom large. More than one million children are at increased risk of contracting infectious diseases. Women and children are particularly vulnerable as their precarious circumstances have left them without access to food, safe water, medicine and shelter. The situation in certain areas within affected districts is reported to be critical as affected communities are at risk of facing malaria epidemics and other communicable diseases. While the Government of Pakistan and NGOs have sent female health workers in the camps, their numbers are not sufficient to meet the enormous demand. Due to lack of access to contraceptives, a wave of unwanted pregnancies with all the ensuing complications is certain. Pre-natal, post-natal check ups and deliveries in health facilities will most likely decrease from an already low baseline. With increasing financial constraints due to the loss of assets during the flood, less household expenses will be spent on health care, meaning that women, children and the elderly - as the most vulnerable population groups - will suffer most. In this context it is also essential to combat the already precarious nutrition situation of children by supplying in particular micro-nutrients.

Damage Quantification

6. The DNA was carried out in two phases: data was collected from districts during the first phase and the second phase constituted consultation and verification of data with provincial Health Departments and field validation visits to some of the affected districts. The data was provided for public sector

health facilities only as there was very little data available with the provincial governments on private sector. Moreover, damage caused to the family planning outlets run by the provincial Population Welfare Departments were negligible (not more than US$ 1.0 million country-wide); hence, this damage has not been reported separately in the report. The data was updated as of 30 September 2010.

7. The total damage to the public health facilities has been estimated at **PKR 1,561.6 million (US$ 18.37 million).** This estimate takes into account a depreciation factor of 50 percent of the replacement cost based on the assumption that the affected health facilities were generally older than fifteen years. Using the revised costs worked out by WHO for early recovery i.e. US$ 104.6 million [including: repair of health facilities, equipment and supplies (32 percent) preventive and curative emergency health programs (53 percent), assessment and surveillance (11 percent) and coordination and health information management (4 percent)], a preliminary assessment for indirect losses has been calculated as US$ 31.3 million based on the assumption that 70 percent of US$ 104.6 million (WHO estimates needed for early recovery) would be required to cover organizational/salary related expenditures. The breakdown of the direct and indirect damage (combined) among the provinces and regions has been estimated as follows; Punjab US$ 4.78m, Sindh US$ 22.6m, KP US$ 16.65m, Balochistan US$ 2.18m, AJK US$ 2.35m, Gilgit-Baltistan US$ 0.03m, and FATA US$ 1.08m.

Proposed Sector Recovery and Reconstruction Strategies

8. ***Proposed Sectoral Strategy and Strategic Options for the Government to decide upon***: While the Government is confronted with an unprecedented challenge, the post-emergency period provides a strong opportunity to revamp and reform the health sector. The recovery strategy will have short-term (taking into account plans developed by humanitarian partners) and long-term components. In the medium-term a comprehensive health sector revitalization strategy should encompass a strategy aiming at the provision of minimum standards for health care, based on the key principles of *equitable access to essential health care, timeliness, results and accountability*.

9. ***Short-Term Measures (up to 12 months):*** Measures will address the urgent needs of the displaced population and returnees, providing health care with alternative interventions (e.g. mobile clinics) and should include:
   - ***Continuation of quality PHC service delivery to affected populations, including those with special needs.*** The DoH should ensure service delivery in the areas of PHC services, including supplementation with micro-nutrients. Other services to be established and/or strengthened include alternative PHC provision system (mobile and temporarily health structure) with a functional referral system for emergency services (EmONC), surgical services for critical health condition, DEWS, DHIS data collation and analysis.
   - ***Post-crisis epidemiological situation:*** From 29 July to 24 September, approximately 6,243,723 patient consultations have been reported to the disease early warning system (DEWS) by 903 fixed and 417 mobile health centers established in the four flood affected provinces. The major causes for seeking health care in these centers were diarrheal diseases (13 percent), acute respiratory infections (15 percent), skin diseases (18 percent), and suspected malaria (3 percent). Since the beginning of the floods, all epidemic prone diseases are being closely monitored. In addition to curative services, preventive and health promotional services are being provided to affected communities to mitigate risks. However, the disease surveillance system will require further strengthening.
   - ***District health planning, vulnerability assessment mapping and vulnerability assessment of health facilities.*** The DoH needs to define the detailed needs of the population, undertake health facility feasibility studies in terms of population movement and utilization rates, and strengthen disease surveillance systems.

- ***Establishment of Emergency Response Cells (ERC or HEPR).*** The DoH need to establish/strengthen the ERCs to timely plan, coordinate and manage health service delivery for the post disaster period and prepare for the recovery and rehabilitation phase.
- ***Human resources planning and management***. Displaced DoH staff and service providers need to be encouraged with appropriate incentives to relocate or return to their original places of service.

10. ***Medium- to Long-Term Measures (12 - 36 months):*** In the medium- to long-term, affected health facilities at all levels will need to be reconstructed and re-equipped. Further measures should include:
    - **Reconstruction and reequipping of health facilities.** After taking into consideration the pre-flood utilization rates and vulnerability to natural hazards of the damaged facilities, a detailed damage assessment with financial analysis needs to be carried out to facilitate decisions about repairing, reconstructing, or relocating the damaged facilities.
    - **Restructure the provision and delivery of PHC services.** The DoH needs to restructure provision and delivery of PHC services through BHUs and RHCs, introducing agreed packages of basic health services, including minimum quality care standards and addressing key principles of equity, accessibility to care, timeliness and accountability.
    - **Assessing alternative models of health care service delivery and its financing:** The DoH also needs to look into other possibilities of support for field operations in health facilities, as budgetary limitations impose severe strain on the system hindering its capacity to absorb even minor emergencies let alone a major one like the current floods.

11. ***Common Elements of Recovery Strategies Across Provinces:*** Emergency preparedness and response capacity of the health sector at all levels has been very low and require urgent and sustained strengthening at all levels. HEPR or ERC need to coordinate the relief and recovery strategies across provinces. Hazard resistant health care facilities should be built on a priority basis in all affected areas based on mapping and vulnerability assessments.

12. ***Existing Risks and Challenges to Health Sector Development:*** Poor overall governance of the health sector, and weak and inefficient physical and functional structure of public health facilities severely aggravate the consequences of disaster related damage. To ensure acceptable health service delivery during and after the emergency, an improved human resource management and distribution system, an efficient and transparent financial management system and a well-coordinated and functional disaster response mechanism are mandatory.

Needs Estimation of Recovery and Reconstruction

13. ***Short-Term: From humanitarian response toward an integrated recovery and rehabilitation*** **[PKR 1,028.5 million (US$ 12.1 million)].** In the aftermath of the floods, interventions were aimed at saving life through a range of activities planned under the Pakistan Initial Floods Emergency Response Plan (PIFERP). A health sector early recovery plan has been worked out by WHO at a total cost of US$ 104.6 million, which is to be funded through the UN's revised Flash Appeal. The WHO has prepared a separate plan for the early recovery phase (12 months) which is being implemented in collaboration with the provincial and district health authorities in the affected districts. In order to integrate both the UN's humanitarian response and WHO's early recovery activities with the health sector's overall rehabilitation, a short-term recovery framework at a cost of US$ 12.1 million (see below) needs to be implemented. This integration effort will take into account the unequal and inequitable pre-crisis health facility coverage, the post-crisis deterioration of the health system, the flood related public health threats, and the return modality and pattern.

14. **Reconstruction needs [PKR 3,123.2 million (US$ 36.74 million)] -** The breakdown of the needs

among the provinces and regions is given in Table 4. Reconstruction needs for the fully and partially damaged health facilities have been estimated based on the scheduled rate per square foot of covered area plus 15 percent as price escalation factor and 10 percent for external development. The total base cost so computed was then applied to the size of different types of damaged health facilities. An additional 10 percent cost for seismic/flood proofing and 15 percent for equipment and furniture were also added to arrive at the total cost for the reconstruction of a totally damaged facility. For partially damaged facilities, the cost for repairs/renovation was estimated at 40 percent of the reconstruction cost of a totally damaged facility.

Table-Annex-7.3: Health - Reconstruction Needs

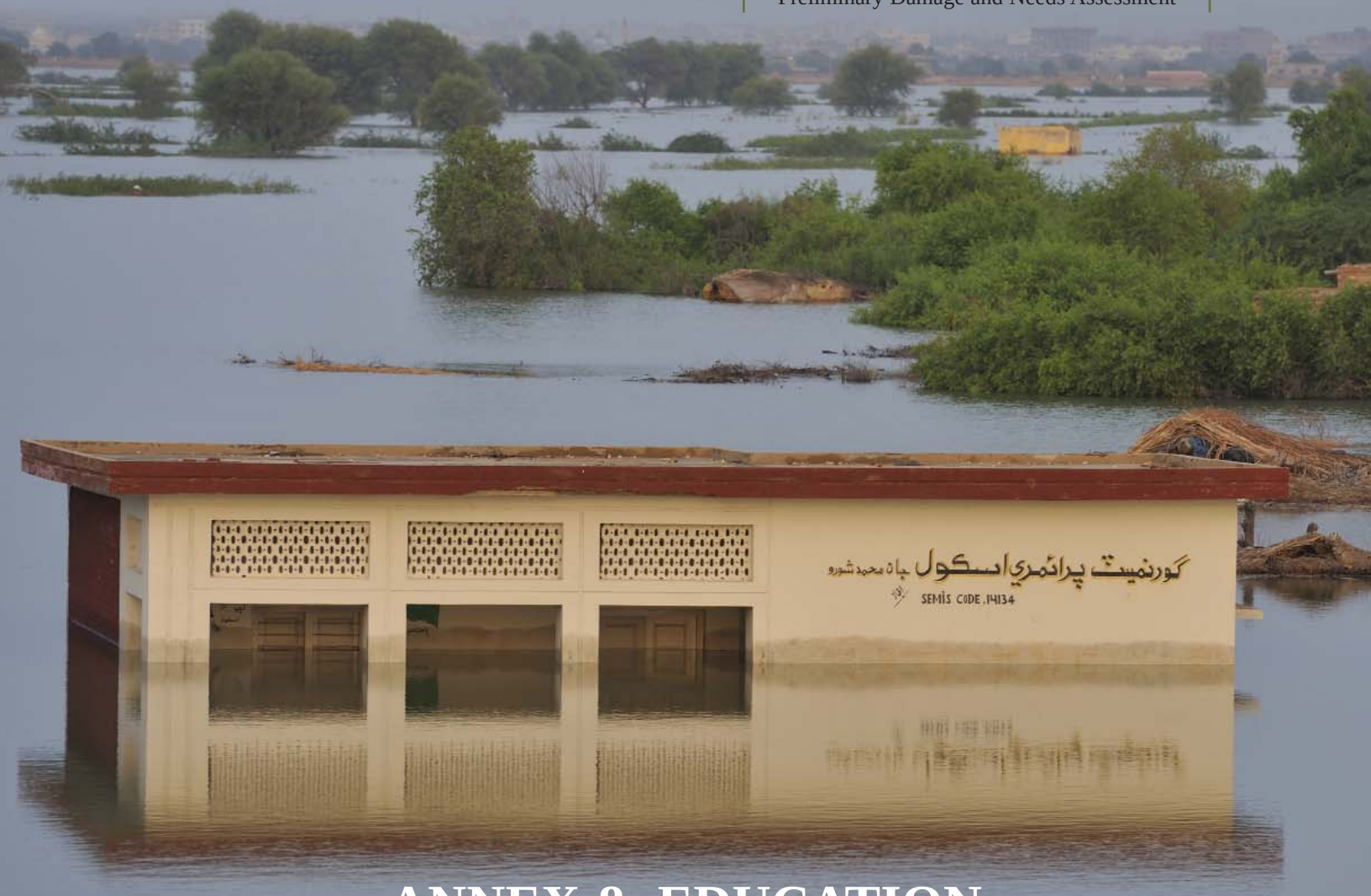
Province/Region	Reconstruction Cost (PKR Million)		
	Fully Damaged	Partially Damaged	Total
Azad J. Kashmir	45.0	103.0	148.0
Balochistan	79.3	57.7	137.0
FATA	0.0	67.9	67.9
Gilgit-Baltistan	1.8	0.4	2.2
Khyber Pakhtunkhwa	397.3	649.4	1,046.7
Punjab	105.6	194.7	300.3
Sindh	1,238.5	182.6	1,421.1
Total	**1,761.9**	**1,255.7**	**3,123.2**

Table-Annex-7.4: Health - Prioritized Recovery Framework/Timeframe

Activity	Short-term / 12 months	Medium- and Long-term
DoH resumes PHC services as early as possible primarily through Emergency Relief Health Services to : ▪ address immediate health care needs of the affected/displaced population ▪ respond to disease outbreaks ▪ prepare for early recovery	MCH services – currently delivered by Relief Organizations be extended to assist DoH to ensure continuity of: pre-natal, delivery and post-natal care, and EPI coverage expanded to prevent CD outbreaks	MCH services remain integral parts of the (to be ratified) package of basic (i) PHC services to be delivered by BHUs, RHCs and (ii) secondary care services to be provided by THQ/DHQ hospitals
	DoH takes over PHC services to deliver routine MCH and basic curative and preventive care services including psychosocial care of affected/displaced people; and DEWS, HMIS and DHIS data collation and analysis. Diarrhea/cholera treatment centers ***Budgetary support needed [Est. US$ 9.0 million over 1 year]***	DoH to restructure provision and delivery of PHC services as per to be ratified and implemented *package of basic health services* which (i) adopts minimum standards for quality care and (ii) responds to key principles of equity, accessibility to essential care, timeliness, results and accountability (focusing on MCH services). Also strengthen response to any disease outbreak

Activity	Short-term / 12 months	Medium- and Long-term
DoH works on affected health infrastructure ▪ damage assessment and utilization profile ▪ service availability mapping to fill accessibility gap ▪ district health planning for facility (re)location ▪ rehabilitation and reconstruction of facility type ▪ hazard-resistant building code	Provide and deliver health care services [< 6mths] through currently in place emergency set-up e.g. medical camps, mobile teams and static clinics in safe and accessible locations near to either existing facilities or where displaced population is concentrated. Assess facility damage and utilization before allocating facilities for either: repair/ renovation/ rehabilitation or full reconstruction in accordance with requirements for hazard-resistant building code. ***TA needed*** ***[Est. included in TA estimate below]***	District and provincial plan base on service availability mapping and return pattern. For affected facilities provide and deliver health care services in the (i) medium-term (< 3 years) through semi-permanent structures e.g. pre-fabricated BHUs and RHCs; and (ii) longer-term (> 3 years) through reconstruction of nominated facilities to required facility and service standards. Standard floor plans and facility designs are available to ensure facility and equipment meet prescribed quality service standards.
DoH acquires physical resources and equipment for continuing services and operating facilities	Relief Organizations will leave behind physical resources and equipment upon their departure. EDOs/DHOs to ensure that handover of physical resources and equipment from partner organizations be kept functional through adequate maintenance and provision of operational costs; and registered on official assets list for functional maintenance and end-of-life replacement (as for routine government assets).	Reconstructed (including refurbished) facilities will be re-equipped as per the *service package* to be delivered from the targeted facility. Standard equipment packages are available for equipping various types of facilities to ensure equipment meets the prescribed standards for quality services delivery. ***Funds needed for (re)construction/ refurbishment of facilities and equipment*** ***[Est. US $ 36.74 million]***
DoH improve health services management functions and supply systems and set up a financing system designed to avoid financial barriers to health care	DoH must take on coordination of relief organizations health programs and must allocate services to priority health need areas. An emergency response cell (ERC or HEPR) needs to be established at DoH to coordinate and manage health services delivery, ensure continuity of supplies and prepare system for early recovery. Humanitarian response should be free ***TA needed*** ***[Est.US $0.35 million]***	In the medium-term, the ERC/HEPR should develop a framework outlining appropriate strategies and timeframe for relief agencies to phase out by ensuring services are smoothly handed over to, sustained and operated by government service providers; and build-up service coverage of resettled population in the longer-term. Measures for improving good governance, responsibility and accountability should be taken. Ensure that vulnerable population will continue to have free access while recovering from floods with transitional measures.

Activity	Short-term / 12 months	Medium- and Long-term
DoH builds up staffing and develops capacity of service providers to deliver health services to the required standards	Staff and service providers may have been displaced or relocated with their families to safer places. In the short-term displaced and/or relocated staff including LHWs could be enticed to return to resume services using incentives e.g. hardship and/or performance remuneration, provision of safe staff accommodation, skills upgrade through in-service training leading to improved career prospects. Skills upgrade linked to in-service to deliver services, in particular MCH, at the required quality standards. ***Budget support*** ***[Est. US $ 2 million]***	In the medium-term a *package of basic PHC services* needs to be ratified and adopted outlining in detail: types and scope of basic services to be delivered by different levels of health facilities; staffing and equipment required to deliver health care services to the required quality standards; and medicines and operational costs including maintenance and asset replacement costs. In the longer-term prescribed *quality standards* will require facilities and providers to be licensed and accredited to ensure adequate clinical resolutions and to meet patient safety standards/satisfaction.
DoH seizes opportunity to redevelop and/or strengthen health system performance	Initiate Clean-Up activities immediately to enable health services to be restored quickly to ensure continuity of PHC/MCH services. Identify affected facilities and assess damage in relation to how quickly they could be made operational again. Prioritize facilities for rehabilitation schedule – seizing opportunity to (i) introduce rational planning for health services delivery sites and types; and (ii) require collation of health information data (DHIS) ***TA needed [Est. included in TA above]***	Adopt medium-term strategy of health services quality improvement to ensure patient safety by rehabilitating infrastructure for service delivery as well as staff accommodation to entice health staff to return to their posts; ensure quality standards in service provision and delivery; build capacity of health managers and providers to restore health services in a post-disaster response context. ***TA needed*** ***[Est. included in budget support]***
DoH to develop disaster preparedness plans based on lessons learnt and make provisional budget for response	Build capacity of MoH and local partners during humanitarian interventions and contribute in the lessons leant process for a better preparedness. ***TA needed [Est. included in TA above]***	Develop a comprehensive disaster preparedness plan with contingency plans and defined standard operating procedures. ***TA needed [Est. included in TA above]***
Total (US $) millions	**12.1**	**36.74**
Total (PKR) millions	**1,028.5**	**3,123.2**



ANNEX-8: EDUCATION

M. Ismail Khan

Background

1. Prior to the floods, there were 172,098 education institutions in the country, (141,120 or 82 percent of these being primary schools and 1,119 colleges) of which 61,500 were for girls and over 32,000 were mixed. Total enrollment in these institutions was 19,924,283 (female enrollment: 7,865,380 or 39.5 percent).

2. The education system in the country can be characterized as one providing limited access and poor quality, particularly for girls and young women, poor management, and weak supervision and support systems. Education is not relevant to the daily lives of the people and does not impart skills useful for employment and workforce needed in the country. The federal, provincial and local governments, are fully aware of this state of affairs and have been trying to take measures to improve the education system but without much success.

3. Natural calamities and human-caused miseries have exacerbated the situation by further aggravating the poor access to and quality of education. The 2005 earthquake brought destruction to a large number of educational institutions in KP and State of Azad Jammu and Kashmir (AJK). Educational institutions in KP and FATA have been continuously facing terrorist threats. Similarly, educational institutions in Sindh and Balochistan were heavily hit by the cyclone and heavy rains in 2007. Gilgit-Baltistan (GB) was hit by heavy rains and crisis of Ata Abad Lake in addition to damage to schools due to terrorist attacks. The reconstruction efforts for such institutions had hardly been implemented when the July-August 2010 torrential rains and consequent floods once again brought devastation to educational institutions in the majority of districts in all provinces and areas including GB, FATA and AJK. KP has been hit by all three types of disasters while Islamabad Capital Territory (ICT) educational institutions have been almost safe from all the previous disasters as well as the current one.

Floods Damage Overview for Sector

4. **Sources and Means of verification:** Multiple sources were used to collect and verify data. The main source for flow of information was the National and Provincial Disaster Management Authorities and Departments of Education. The education team also interacted directly with the education authorities in the provinces and areas wherever further clarification or additional information was required and to seek their views regarding the extent of devastation. Additional teams also visited the affected areas to verify data. However, the data may need to be refined as more detailed surveys are conducted to prepare projects and plans to implement the findings of the DNA exercise. Indeed, facility-by-facility detailed needs should be worked out during the reconstruction phase when the water has completely receded and all sites are accessible for detailed study. The team also used the knowledge and ideas assimilated through such direct contacts during previous damage needs assessment rounds. The data on private sector educational institutions was not made available to the team. Therefore, the present assessment covers public sector institutions exclusively.

Damage to Facilities (direct and indirect) - in quantitative terms

5. A total of 10,407 institutions suffered damage and loss in around 90 affected districts, (3,741 fully destroyed and 6,666 partially damaged), of which 25 percent are girls'.[101] However, overall this represents only 6.2 percent of the total institutions in the country and 12 percent of the total institutions in the affected districts. The partially damaged institutions constitute around 64 percent of the total damaged institutions. Damage to educational institutions has affected around 32,000 teachers and 1.04 million students (0.42 million girls).

[101] Damage to girls' institutions is estimated on the basis of information provided by FATA, KP, Punjab and Sindh. Other provinces did not provide information with female/male breakup.

6. The largest number of institutions affected are in Sindh (5,655 including 811 girls' schools) followed by Punjab (2,817 including 1,222 girls' schools), KP (915 including 626 girls' schools), Balochistan (557), FATA (176 including 95 girls' schools), Gilgit-Baltistan (81) and AJK (194). The majority of affected institutions are primary schools (9,368 out of 10,407 or 90 percent). The most heavily damaged district in the country is Jacobabad (1,247) in Sindh followed by Muzaffargarh in Punjab (1,164), Thatta (966), Dadu (764), and Kashmore (571) in Sindh. Rajanpur (410) and Jhang (311) in Punjab and D.I. Khan (311) in KP are also among the heavily hit districts.

Table-Annex-8.1: Education - Physical Damage Detail - Schools

Categories	AJK	Balochistan	FATA	Gilgit/ Baltistan	Khyber Pakhtunkhwa	Punjab	Sindh	National
Higher Secondary Schools							**20**	**20**
Completely Destroyed							*10*	*10*
Partially Damaged							*10*	*10*
Secondary Schools	**21**	**25**	**7**	**8**	**52**	**141**	**121**	**375**
Completely Destroyed	*2*	*2*	*3*	*1*	*9*	*19*	*54*	*90*
Partially Damaged	*19*	*23*	*4*	*7*	*43*	*122*	*67*	*285*
Middle Schools	**47**	**37**	**14**	**25**	**81**	**264**	**97**	**565**
Completely Destroyed	*16*	*1*	*2*	*6*	*20*	*34*	*43*	*122*
Partially Damaged	*31*	*36*	*12*	*19*	*61*	*230*	*54*	*443*
Primary Schools	**126**	**495**	**155**	**46**	**737**	**2,412**	**5,417**	**9,388**
Completely Destroyed	*20*	*25*	*30*	*12*	*197*	*604*	*2,627*	*3,515*
Partially Damaged	*106*	*470*	*125*	*34*	*540*	*1,808*	*2,790*	*5,873*
Grand Total	**194**	**557**	**176**	**79**	**870**	**2,817**	**5,655**	**10,348**

Table-Annex-8.2: Education - Physical Damage Detail - Colleges/Technical and Vocational Institutions

Categories	AJK	Balochistan	FATA	Gilgit/ Baltistan	Khyber Pakhtunkhwa	Punjab	Sindh	National
Colleges	**4**	**0**	**0**	**2**	**13**	**4**	**0**	**23**
Completely Destroyed	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*3*
Partially Damaged	*4*	*0*	*0*	*2*	*13*	*1*	*0*	*20*
Technical/Vocational Inst.	**0**	**0**	**0**	**0**	**17**	**4**		**21**
Completely Destroyed	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*
Partially Damaged	*0*	*0*	*0*	*0*	*16*	*4*	*0*	*20*

Service and Productivity Losses

7. Most of the affected districts are in the summer zone and the flooding occurred during the summer vacations. There was no loss of life among the students or staff, since most students were not in schools and colleges. This also meant the floods did not result in loss of educational contact hours, the only exception being that summer vacations were extended up-to Eid-Fitr (although some provinces, such as Punjab, had announced summer vacations up-to Eid-Fitr even before floods occurred). However, indirect losses are in several forms. A large number of institutions were used to provide shelter to the internally displaced persons (IDPs). For example, in Punjab, 2,169 schools and in Sindh 2,372 schools are being used as shelters for IDPs.

8. It is likely that a significant number of students and teaching and non-teaching staff will suffer from emotional trauma, necessitating counseling services. This in turn would require teachers to be trained for school-based psychosocial support, such as counseling. Students of schools used as temporary shelters for the displaced are themselves being displaced with respect to (the certitude of) schooling, while for those whose schools have been destroyed or partially damaged schooling has been or will be interrupted unless prompt arrangements are put in place to ensure continuity. Further, in the absence of proper facilities and equipment, it is conceivable that the already poor quality of education may be impaired further. Operational costs for running the fully or partially damaged schools by using alternate means will be much higher.

Damage Quantification

9. ***Assumptions.*** The following assumptions have been made for estimating the financial costs for the damage incurred:
   - If a building is damaged, it is assumed that its furniture and fixtures will also be almost fully damaged.
   - Offices and residences damaged are not reported in the damage list, therefore, it is assumed that either there was no loss to office buildings or the administration has managed to repair affected offices.
   - Hostels are included in the damage to buildings particularly in colleges where most hostels are.

10. The **direct damage** has been calculated by applying the following formulae:
    - ***Fully Destroyed:*** Depreciation Factor x Unit Cost x number of affected institutions
    - ***Partially Damaged:*** Depreciation Factor x 0.4 (estimating damage as 40 percent) x Unit Cost x affected number of institutions

11. The total **damage and loss** for Pakistan's educational institutions works out to be PKR 26,464.3 million (US$ 311.3 million). The highest damage is estimated in Sindh amounting to PKR 13,354.9 million (US$ 157.1 million) followed by Punjab with PKR 7,881.3 million (US$ 92.7 million), KP with PKR 2,859.5 (US$ 33.6 million). Damage and loss in Balochistan is PKR 775.5 million (US$ 9.12 million), and for AJK, FATA and GB, it is PKR 842.3 million (US$ 9.9 million), PKR 414.8 million (US$ 4.88 million) and PKR 336.2 million (US$ 3.95 million) respectively. It is estimated that damage to girls' institutions is in the ratio of 1:4.

Table-Annex-8.3: Education - Damage and Loss Figures

Province/Area	Damage	Loss	Total
AJK	782.9	59.4	**842.3**
Balochistan	608.4	167.1	**775.5**
FATA	361.8	52.8	**414.6**
G-B	311.9	24.3	**336.2**
KPK	2,585	274.5	**2,859.5**
Punjab	6,383.1	1,498.2	**7,881.3**
Sindh	11,013.4	2,341.5	**13,354.9**
National	**22,046.5**	**4,417.8**	**26,464.3**

All figures in PKR millions

12. **Reconstruction Needs:** Reconstruction will be undertaken using a two steps approach: first being the immediate recovery needs in the *short-term* (6-12 months) and simultaneously, starting long-term reconstruction. In the short-term, various alternatives will be used to commence education work immediately. These alternatives include tents, rented buildings/borrowed buildings, temporary structures and repair of partially damaged buildings or their portions that are easily repairable. The estimated cost of this will include temporary shelters as described above, seating (*"Tat Patti", "Chowkis"* or new/repaired furniture, where possible) and educational materials. The teachers and students would need orientation, and children will be vaccinated. The cost is estimated to be PKR 0.3 million for each damaged institution and those being used by IDPs. *Long-term reconstruction* will entail the actual reconstruction of buildings or repair of partially damaged buildings. Total reconstruction needs are estimated to be PKR 42,906.58 million (US$ 504.8 million), of which around 25 percent (US$ 126.2 million) will be for girls' institutions, and including PKR 5,410.575 million (US$ 63.7 million) for short-term needs. The highest cost is estimated for Sindh of PKR 22,840.63 million (US$ 268.7 million). For Punjab, it is PKR 11,870.31 million (US$ 139.7 million), for KP, PKR 4,492.86 million (US$ 52.9 million) and for Balochistan PKR 1,309.6 million (US$ 15.4 million), while for AJK, FATA and GB, the cost is, PKR 1,228.125 million (US$ 14.4 million), PKR 624.185 million (US$ 7.3 million) and PKR 540.87 (US$ 6.4 million) respectively.

Table Annex-8.4: Education - Reconstructions Needs

Province/ Area	Short-term	Long-term	Total Reconstruction Millions	
	6-12 months	12-36 months	PKR	US$
AJK	61.125	1,167	1,228.125	14.4
Balochistan	215.6	1,094	1,309.6	15.4
FATA	66.185	558	624.185	7.3
GB	33.87	507	540.87	6.4
KP	351.86	4,141	4,492.86	52.9
Punjab	1,810.305	10,060	11,870.31	139.7
Sindh	2,871.63	19,969	22,840.63	268.7
National	**5,410.575**	**37,496**	**42,906.58**	**504.8**

Proposed Sector Recovery and Reconstruction Strategies

13. The federal and provincial governments are in the process of formulating their reconstruction strategies. The strategy for the education sector should form part of the overall country and province-specific strategy to address multi-hazard risks and other common factors and requirements for reconstruction.

14. The reconstruction strategy provides an opportunity that should be availed to improve access to higher quality education through improved design of physical learning spaces, social and physical access, teacher development, and capacity development of the district education offices for improved service delivery. It also provides an opportunity to ensure that building codes are enforced. Monitoring of compliance with these codes is essential and here the National, Provincial and District Disaster Management Authorities have a critical role to play. The Education Departments at provincial and district levels will need to play a leading role in the planning and implementation of recovery and reconstruction of the education system. The capacities of district governments and other stakeholders such as NGOs and the private sector need to be factored in and efforts made to increase them if implementation of the reconstruction exercise is to be expedited.

15. The five major recommendations on policy guiding principles are as follows:

Start learning-teaching process immediately

16. The first and the foremost guiding principle for the reconstruction strategy is to ensure that all children of school-going age have access to education activities in a protective environment as soon as possible. The Government has started providing temporary shelters, "school-in-a-box" kits and temporary learning centers with the support of donor agencies like UNICEF, and international and local NGOs. In addition, arrangements will need to be put in place for textbooks and learning materials to be provided, vaccination of children in their temporary residences and in schools, and to ensure hygienic conditions in temporary or semi-permanent schools. Educational institutions will need shelter, students will need books and other learning materials, and teachers will need orientation to meet the psychosocial needs of the students who suffered as a result of the disaster.

Consolidate educational facilities

17. The provincial Education Departments have emphasized the need for consolidation, which will minimize wastage and under/over-utilization of facilities. Consolidation will include: (a) maximizing utilization of existing learning spaces before reconstructing; (b) merging schools with low enrollment where feasible; (c) not constructing non-functional schools; (d) merging boys' and girls' primary schools in the same village with low enrollments while keeping in view local conditions; (e) providing classrooms in damaged buildings in accordance with the number of students enrolled, etc. To achieve this goal, Education Departments will assess the enrollment capacity of each damaged institution before the floods, actual enrollment, and make decisions about viability of further enrollment, closure/merger and provision of additional classrooms.

Conduct facility-by-facility survey

18. In order to make a more accurate assessment of the actual number of institutions affected and of the extent of damage to each institution, a facility-by-facility survey will need to be conducted simultaneous to formulating strategies and starting the education process. This will help in assessing the actual reconstruction needs of each facility and in making consolidation decisions. Experienced teams of surveyors and data analysts with the capability to map facilities will be required.

Prioritization of reconstruction needs

19. Rural girls' institutions should be rehabilitated first followed by those for rural boys. This is necessary because schools in urban areas generally receive more attention compared to those located in rural areas. In addition, schools for boys are generally better off than girls' schools, whose educational levels are already low. Similarly, partially damaged institutions should be repaired first and then fully damaged institutions should be reconstructed. For this purpose, girls' and rural educational facilities should be surveyed first and decisions about consolidation and reconstruction needs should be made and implemented.

Engage Parent-Teacher Associations (PTAs)/School Management Committees (SMCs)/School Councils (SCs) in Reconstruction Work

20. Government construction agencies and private contractors hired by them cannot carry out reconstruction work spread mostly over rural areas by themselves. Existing PTAs/SMCs/SCs should be given an enhanced role in rehabilitation and maintenance of schools. Actions required in this regard include engaging with communities to enter into partnerships for school rehabilitation and arranging the orientation trainings required.

Table Annex-8.5: Education - Prioritized Sector Recovery Framework/Timeframe

Activity	Short-term (6-12 months)	Medium- and Long-term (12-36 months)
Resume teaching work	**4886.75**	
Damage assessment, facility-by-facility survey	**382.04**	
Teacher Orientation	**161.705**	
Reconstruction work		**37,496.00**
Total (PKR million)	**5,430.575**	**37,496.00**
Total (US$ million)	**63.89**	**441.13**

ANNEX-9: GOVERNANCE

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Background

1. ***Weak state capacity:*** Pakistan has long been characterized by political instability leading to a lack of policy continuity and impaired economic management. The country is governed by fragile coalitions at the centre and the provinces. Unrest in KP and Balochistan has kept civilian governments under pressure, diverting their attention from institutional reform to matters of a more immediate and ad hoc nature. The political situation remains unstable and the institutional decline has marred state capacity to effectively deliver basic services.

2. ***Terrorism and war:*** Almost all urban centers in Pakistan have borne the brunt of terrorist attacks since September 11, 2001. Since 2009, the Pakistan Army has been fighting the terrorists and has carried out successful operations in Swat (KP) and Waziristan (FATA), albeit at a high price. Between FY 2004/05 and 2008/09, Pakistan's economy suffered direct or indirect losses amounting to PKR 2.1 trillion (US$ 24.3 billion).

3. ***Institutional capacities:*** The failure to turn resources into development outcomes is directly attributable to low institutional capacity across the provinces. Widespread corruption, misallocated and inefficient public expenditure influenced by elected or unelected vested interests and incentives dilute the impact of public programs aimed at improving the welfare of citizens, particularly the poor and marginalized segments of the population including women. Governance reform efforts have also been only partially successful and the country has not undertaken any major civil service reform since the 1970s.

4. ***Local government rollback:*** Prior to the floods, the local government system was rolled back while new arrangements for representative and accountable local governance were not put in place. KP and Balochistan have enacted new laws, while Sindh and Punjab provinces have yet to decide on this vital issue. Currently, unelected administrators are managing districts and *tehsils*, further eroding capacities as almost 50 percent of district level posts remain vacant.

5. ***District capacities:*** Reconstruction capacity at the district level is a factor of two sets of staff: the designers and executors (Engineering Departments) and planners and approvers (Finance and Planning Offices). KP, having reverted to the pre-devolution institutional arrangement, only has provincial engineering cadres, which in the case of C&W have just been boosted by the recruitment of 70 Assistant Engineers, while the provincial P&DD still suffers from serious staffing shortages. In Punjab, though staffing was generally reported to be adequate at the district level, the affected district of Muzaffargarh had half the posts of Sub-Engineers - the critical field supervisors - vacant. The F&P offices were invariably deficient in either the DO Finance or DO Planning, plus a number of the lower tier DDO level officers throughout most of the southern districts. The larger size and resources of Punjab meant however, that in the event of additional funding finding its way to these districts, reallocation of staff from other districts could possibly ameliorate this gap. In Sindh, the district level engineering staff generally appeared to be in place with fewer vacancies, though there were significant gaps in staffing levels at the Finance and Planning Office level.

6. ***Recent Shifts in Governance Paradigm:*** Notwithstanding the structural constraints faced by governance in Pakistan, the country has undertaken wide-ranging reforms in the past few years. These reforms have a direct relationship with the post-disaster rehabilitation and reconstruction phase. One, the agreement on the 7th National Finance Commission (NFC) Award has increased the share of the provinces in the federal divisible pool from 47.5 percent to 57.5 percent. Two, the passage of the 18th Constitutional Amendment in April 2010 is aimed at achieving 'participatory federalism'. The vast concurrent list of legislative subjects has been eliminated, providing provinces with exclusive legislative powers and control over vital development domains. Three, Pakistan has also witnessed the growth of

a robust electronic media that has impacted the traditional culture of governance.

7. ***Exacerbated capacity gaps:*** As the reconstruction challenge mounts and the weak technical and PFM capacities start showing signs of stress, lagging reconstruction targets and unfulfilled expectations will be directly translated into popular anger and resentment. During FY 2009/10, Punjab was only able to spend less than 61 percent of its ADP, while Sindh spent 60 percent and KP spent only 51 percent. The picture was more acute at the district level where average utilization figures for districts most affected by floods were as low as 10 percent in Punjab, 20 percent in districts from Sindh, and 68 percent in KP. The project development cycle typically suffers from inadequate capacity to prepare PC-I's[104] of some complexity particularly at the district level, where the technical expertise is lacking due to shortage of qualified staff. The budgetary releases still suffer from last quarter lumping, though expenditure accounting has improved due to PIFRA SAP software installation in all but some districts of Balochistan.

8. ***Reconstruction super load vs. existing capacity:*** The usual public sector capacities in the provinces are likely to be challenged by anything between four to seven times the normal development workloads. If the existing planning and implementation capacities of the provinces - currently showing ADP utilization of less than 50-60 percent of the allocated development budgets - and districts most affected by floods are pitched against the twenty-fold expected increase in the post-flood reconstruction workload[105] and more than hundred times their actual execution of last year, the "business-as-usual" approach is likely to fail.

9. ***Implementation arrangements must consider the huge capacity gaps:*** The need for a nodal coordinating body at the center is clear but there is also a need for a provincial body to coordinate implementation. Functions at the federal level include: funding (mobilization, funds allocation and flow); national policy; oversight of funding and policy compliance; and implementation of national programs. Functions at the provincial level include: implementation of provincial programs including planning, design, approvals, construction, materials and equipment; monitoring and reporting; and grievance redressal. Specific arrangements at the federal, provincial and district levels must be included in the overall strategy that is informed by aspects considered later in the annex. Specifics of implementation arrangements will be discussed in Annex 5 on Implementation Arrangements.

Flood Damage Overview

10. Table 1 details the direct damage to the governance sector. The direct damage to governance institutions has been immense affecting 1,437 critical public service buildings and facilities. Local government buildings, police infrastructure and post offices have been hit the hardest.

[104] PC-I is a Planning Commission template used for submitting development project proposals.
[105] It is assumed that the most affected districts will account for 70% of the DNA estimates.

Table Annex-9.1: Governance Infrastructure - Physical Damage Details

Provinces/ National	Type 1		Type 2		Type 3	
	Completely Destroyed	*Partially Damaged*	*Completely Destroyed*	*Partially Damaged*	*Completely Destroyed*	*Partially Damaged*
Azad J. Kashmir	2	4	2	0	0	0
Balochistan	1	2	0	8	0	16
FATA	0	0	0	26	0	0
Gilgit-Baltitstan	1	4	1	11	1	20
Khyber Pakhtunkhwa	20	92	62	201	149	356
Punjab	7	15	13	27	21	44
Sindh	15	30	138	46	52	50
National	**46**	**147**	**216**	**319**	**223**	**486**

Type 1: District level, Type 2: Sub Division/Tehsil level, Type 3: UC/ Village level.
Unit = No.

11. ***Revenue administration:*** In AJK, the revenue record, despite its contested nature, is intact and little damage was caused to revenue administration buildings. In KP, the revenue record has been damaged in Nowshehra, Dera Ismail Khan and Charsadda. In other districts partial damage has been reported. Overall, the issues of land tenancy in Swat and insecurity in terms of law enforcement are likely to exacerbate in the short-term, with women and children bearing the brunt of the social costs. In Punjab, the land records remain intact though at some places the buildings of the local administration have been badly damaged. Damage to revenue records in Sindh has been significant. Land relations could be affected since many farmers (men and women) are not owners but only sharecroppers, tenants or laborers (with men worsening the socioeconomic situation of women tenants by receiving the women's wage on their behalf).

12. ***Police:*** KP and Sindh have suffered the most due to the recent disaster. In KP districts (Swat, Kohistan, Dera Ismail Khan, Nowshehra and Charsadda) damage has been the greatest. The district jails and judicial lock-ups have also been damaged. While police records have remained safe in general, the inundation of Nowshehra district led to the destruction of some police records. In Sindh, law and order is likely to emerge as a major challenge due to the destruction of several police checkposts and police stations especially located in the kacha (riverine area). In Punjab, police infrastructure was damaged and the capacity of the police to manage law and order was impaired. The districts hit in the Punjab are situated on the borders of KP and Balochistan, which remain vulnerable to extremist and anti-state movements in the adjoining areas. In AJK, nearly thirty entry points remain unmanned.

13. ***Formal Justice Institutions:*** Some areas of AJK and KP which were still in the reconstruction phase after the 2005 earthquake have been hit by the floods. In KP, major damage was caused by floods to district courts in Nowshera and Swat adding to the prevalent problem of dilapidated district court structures. As the court buildings were completely submerged, at least 50 percent of all records have been damaged. In Sindh, the residents of the kacha area (along the river banks) comprising two million people are the worst hit; most of these residents operate in the informal governance domain and less than 20 percent have ID cards.

14. ***The National Database and Registration Authority (NADRA):*** NADRA has also sustained damage to

its offices in the flood affected areas. 12 out of its 400 offices were completely damaged while 20 sustained partial losses. Of its 13,000 employees, 2,500 have suffered direct losses. The total damage for these has yet to be assessed by NADRA.

15. ***Election Commission of Pakistan:*** The Election Commission reported damage to two of its district offices. Its office in Nowshera was completely destroyed; however the damage cost is yet to be assessed. Similarly, its office in Jaffarabad was also destroyed but the extent of the damage has yet to be reported due to on-going floods in the area.

16. ***Pakistan Post:*** Pakistan Post operations were also affected nationally. The Department reported that out of its 13,000 post offices, 513 across the flood affected districts have been affected partially or completely. The Department also reported loss of equipment, vehicles and essential infrastructure such as transmission lines.

17. Indirect damage poses a greater risk in terms of people's access to state services, their ability to secure entitlements and livelihoods in an adverse security climate. In KP, the wave of terrorism continues unabated as the insurgents have reportedly regrouped, thereby hampering the efforts of the Government to undertake relief and early recovery. A cumulative estimate of losses is presented below in Table 2 which shows that the total damage caused by the floods in the governance sector tentatively stands at PKR 6 billion.

Damage Quantification

18. The assessment is based on the data provided by provincial/regional governments of damage to governance-related public infrastructure. The data varied in quality. Detailed damage data and reconstruction needs were available in the case of Punjab. Damage and reconstruction estimates for Balochistan are based on information from two districts only. Similarly, for regions like Gilgit-Baltistan, a department-wise breakup has not been provided. The Governance DNA team conducted on-ground validations in Punjab, KP, AJK, Sindh and GB and these failed to reveal significant differences between reported and actual damage. Data for governance infrastructure was collected from a multitude of

Table Annex-9.2: Governance Infrastructure - Damage and Losses

Provinces/ National	Direct Damage	Indirect Losses	Total
	PKR million		
Azad J. Kashmir	86.38	1.09	87.47
Balochistan	42.26	70.13	112.39
FATA	25.95	-	25.95
Gilgit-Baltistan	24.16	52.30	76.46
Khyber Pakhtunkhwa	978.33	691.67	1,670.00
Punjab	121.05	836.65	957.70
Sindh	1,862.89	1,183.10	3,045.99
National (PKR million)	**3,141.03**	**2,834.94**	**5,975.97**
National (US$ million)	**36.95**	**33.35**	**70.31**

departments and agencies in a number of formats. Standard units were not available to quantify and classify damage to the governance infrastructure which further complicated the damage and needs assessment. Consequently, a number of assumptions and approximations had to be made to collate the damage at provincial and national level. Direct damage has been estimated at US $36.95 million, with indirect losses standing at approximately US $33.35 million. Table 2 details the province-wise loss estimates.

Proposed Sector Recovery and Reconstruction Strategy

19. ***Strengthening human resources:*** In the reconstruction phase, a comprehensive HR framework will be required. Currently, there are districts with high levels of vacancies (in some cases up to 50 percent).[106] The technical capacity of existing staff (mostly male) to plan, manage, and monitor reconstruction projects is weak and gaps in skills need to be plugged. Similarly, frequent postings and transfers would need to be avoided, and incentive systems (like market based salaries) developed to attract and retain quality officers in the districts. The required departmental capacity should be strengthened through external resources such as consultants, contractual staff, short-term trainings, central/regional capacity pools, and so on.

20. ***Streamlining public administration systems:*** A regular fund flow and fast-track approval processes need to be created to ensure timely and effective reconstruction implementation, but not at the cost of transparency and accountability. It will be necessary to work with the provincial P&DDs to enhance approval limits and hold frequent, mandatory meetings of project approving bodies.

21. ***Strengthening grievance redressal system:*** Grievance redressal systems need to be strengthened and a separate special window could be set-up to deal with reconstruction implementation, together with alternate dispute resolution mechanisms for dealing with issues related to contracts. In their absence, the existing judicial systems that are already overburdened will be further clogged. Legal aid centers established in the aftermath of the 2005 Pakistan earthquake, have successfully assisted in over 26,000 cases (complaints lodged by men and women) including some 700 court cases, and could be a model to follow in the post-flood rehabilitation program.

22. ***Improving intergovernmental coordination:*** Mechanisms for vertical coordination between federal, provincial and district governments, as well as mechanisms for horizontal coordination between various departments need to be clarified. A Nodal Agency at the center will be necessary to ensure overall coordination and M&E, also acting as an interface for donors and so on. A dedicated set up is required - with special features for public transparency and citizen oversight - both at provincial (e.g. a special cell in P&DD) and district level.

23. ***Resettlement:*** Resettlement, reconstruction and flood zoning issues need to be addressed for the riverine and wetland areas (kacha areas) based on international good practice. This will help guide the reconstruction activities in these areas, along with the attendant reinforcement requirements whereby reconstruction is considered safe based on defined criteria.

24. ***Improving procurement:*** Inadequate planning and inaccurate cost estimates can lead to weaknesses in project implementation. Therefore, cost estimates must be based on market rates. Similarly, it must be ensured that these projects are awarded to competent and qualified firms through a transparent, competitive process in which citizens are provided due information on selection criteria. Collusion among contractors, suppliers and consultants will have to be avoided by ensuring that all procurement oppor-

[106] Sex disaggregated data was difficult to obtain due to inherent the problem of record-keeping within the government. However, it could be safely assumed that most of these vacancies are generally filled by male personnel.

tunities are widely disseminated and technical assistance is taken from the Competition Commission of Pakistan (CCP).

25. ***Ensuring transparency and monitoring results:*** The Government should create transparent mechanisms and provide up-to-date information about financial and physical performance (expenditure and results) on a dedicated website whereby the public can track progress. In rural areas, local decisions in this regard can be announced through Union Council offices and project details can be pasted on public notice boards for citizen access. CBOs can also play a useful role in enhancing public access to information in rural areas.

26. ***Ensuring community participation:*** In the aftermath of the floods, it is important that reconstruction activities establish a feedback loop, which incorporates direct, gender-responsive and socially inclusive, community participation. Involving the affected communities and ensuring women and all marginalized sections such as minorities and the disabled, are included in reconstruction provides a direct stake (income generation) to the affectees in reconstruction and also utilizes the resource pool present in those communities.

Needs Estimation of Recovery and Reconstruction

27. The DNA estimates that PKR 3.8 billion would be required to meet the costs of building vital infrastructure. A further PKR 1.1 billion are required for restoring and, where needed, augmenting state capacities to deal with the post-disaster situation. Table 3 summarizes the region-wise costs.

Table Annex-9.3: Governance Infrastructure - Recovery and Needs Assessment Summary

Provinces/ National	Reconstruction and Rehabilitation/Repair Costs	Capacity Building	Total
	PKR million		
Azad J. Kashmir	103.66	31.10	134.76
Balochistan	50.71	8.70	37.69
FATA	31.15	9.34	40.49
Gilgit-Baltistan	29.00	15.21	65.92
Khyber Pakhtunkhwa	1,174.00	352.20	1,526.19
Punjab	145.26	43.58	188.83
Sindh	2,235.47	670.64	2,906.11
National Total (PKR)	**3,769.23**	**1,130.77**	**4,900.00**
National Total (US$)	**44.34**	**13.30**	**57.65**

Sector Recovery Framework

28. The proposed framework focuses on the following four principles: (1) Improvement in sub-national capacities, (2) Provinces should lead reconstruction programs, (3), Fast-track provision of entitlements, and (4) Strengthening country PFM systems. The following table prioritizes actions for the short-, medium- and long-term.

Table Annex-9.4: Governance Infrastructure - Prioritized Sector Recovery Framework/Timeframe

Activity	Short-term (12 months)	Medium- and Long-term
Civil Administration	1. Recovery of damaged records 2. Provision of adequate physical and administrative resources to ensure continuity	1. Rebuild damaged property 2. Focus on automation of business processes and records 3. Increase capacity of federal/provincial/local agencies 4. Facilitate and enhance capacities for forging Public-Private Partnerships
Judiciary	1. Recovery of damaged records 2. Provision of adequate physical and administrative resources for ensuring continuity	1. Rebuild damaged property 2. Focus on automation of business processes and records 3. Set up legal aid clinics for the dispossessed and for legal disputes concerning land
Police	Provision of additional resources including vehicles and communication systems to tackle increase in crime	1. Rebuild damaged property 2. Computerize police stations and records 3. Carry out public safety work
Auqaf	Rehabilitation of damaged shrines	1. Conduct detailed mapping of land use around shrines 2. Develop land records pertaining to *madressahs* and mosques into a comprehensive database for provincial planners
Accounts/Audit Offices	Implement PIFRA at sites where not currently deployed	1. Roll out PIFRA within provincial departments with eventual district hook-ups, 2. Support Finance Departments & P&DD for quick fund flow mechanisms and tracking expenditures
Post Offices	Ensure continuity of public services through alternate arrangements	1. Rebuild damaged property 2. Focus on automation of business processes and records
Local Government	1. Recovery of damaged records 2. Provision of adequate physical and administrative resources to ensure continuity	1. Rebuild damaged property 2. Focus on automation of business processes and records 3. Focus on building project preparation, financial management, budgeting and planning capacities 4. Set up complaints redressal systems 5. Set up community-driven reconstruction programs and adequate capacities within local government 6. Facilitate and enhance capacities for forging Public Private Partnerships
Total (PKR million)	**980.0**	**3,920.0**
Total (US$ million)	**11.5**	**46.1**

ANNEX-10: IRRIGATION AND FLOOD MANAGEMENT

Philip Wood

Background

1. Agriculture generates about 21 percent of the country's gross domestic product (GDP). Of the 79.6 million ha total land area, the cultivated area is about 22 million ha. With erratic and low rainfall-average annual rainfall is less than 240 mm - Pakistan's food production depends heavily on irrigated agriculture. About 80 percent of the arable land and 90 percent of the agricultural outputs depend on irrigation. The Indus Basin Irrigation System (IBIS) supplies irrigation water to about 13.5 million ha. Besides the IBIS, spate, lift schemes, micro-dams and *karezes*[107] provide small-scale irrigation to another 0.8 million ha.

2. Punjab accounts for 80 percent of Pakistan's agricultural production, derived from 10.3 million ha of irrigated land. Punjab's irrigation system draws water from Mangla reservoir, Chashma Barrage-cum-reservoir and twelve barrages on the Indus, Jhelum, Chenab, Ravi and Sutlej rivers. The system comprises eight inter-river link canals, nineteen main canals and their distributing system. Over 9,800 km long drains and some 3,500 public sector tubewells complement the irrigation system. Sindh's irrigation system consists of the Guddu, Sukkur and Kotri Barrages on the Indus River which divert water into fifteen canals commanding 2.5 million ha. Over 2,200 km of drains and some 5,800 tubewells compliment the irrigation system. The irrigation systems in Khyber Pakhtunkhwa (KP) command 720,000 ha. These include four main irrigation systems: Upper Swat, Lower Swat, Kabul River and Chashma Right Bank Canal (CRBC). The Pehur High-Level Canal off-taking from the Indus River at the Tarbela reservoir supplements the irrigation supplies to the Upper Swat irrigation system. Balochistan's canal irrigation system serves about 770,000 ha. The main canals, part of the IBIS, are Pat Feeder, Kirther and Uch. Hill torrents, karezes, tubewells and springs are other water sources of the smaller irrigation systems. The irrigation systems in the three northern regions-Azad Jammu and Kashmir; Gilgit-Baltistan; and the Federally Administered Tribal Areas (FATA)-are small-scale run-off-the-river systems because of the mountainous topography in these regions.

3. Since its creation, Pakistan has faced eight severe floods. These floods resulted in more than 8,000 lives lost, affected more than 100,000 villages and towns, and eroded some 285,000 ha of land. The cumulative financial loss of these floods is estimated at about PKR 765 billion.[108] The country's flood management strategy includes flood forecasting and early warning, flow regulation through the two main reservoirs (Tarbela and Mangla), and protecting urban and rural areas through more than 5,500 km of embankments and river training works, and flow regulation at barrages. The Federal Flood Commission (FFC) and Water and Power Development Authority (WAPDA) are responsible for flood management at the federal level; Pakistan Meteorological Department (PMD) is responsible for flood forecasting and early warning with the support of WAPDA; and Provincial Irrigation Departments (PIDs) are responsible for operating barrages and canals as well as construction of flood protection infrastructure.

Flood Damage Overview

4. The 2010 floods in the Indus River caused significant damage to irrigation, drainage, and flood protection infrastructure. Breaches in the flood embankments occurred at three locations in Punjab and four in Sindh. Flash floods in the mountainous areas in the north and west of the country caused damage to small-scale river training works and irrigation systems. The assessment is based on the damage data compiled by the PIDs and WAPDA. The damage information was validated on a sample basis using baseline information, meetings with government officials and random site visits. With the exception of the fully damaged Munda Headworks in KP, all other major structures are reported as partially damaged. Possible damage to submerged components of barrages on the Indus River could not be ascertained. The indirect losses such as damage to crops due to flooding and disruption of irrigation supplies, and siltation of agricultural land are covered by the agriculture sector.

[107] A kareze is an indigenous method of irrigation in which groundwater is tapped by a tunnel. After running for some distance, the tunnel comes out in the open and the water is conveyed to the command area through channels.
[108] Federal Flood Commission, Flood Protection Plan 2006, and the Pakistan Journal of Life and Social Science, Poverty in Riverine Areas: Vulnerability, Social Gaps and Flood Damages, 2008, 6(1).

5. In KP, the floods washed away the Munda Headworks on Swat river-a source of irrigation for about 50,000 ha in Mardan and Charsadda districts. The head reach of the Lower Swat Canal (LSC) was also washed away. The KP Irrigation Department has partially restored irrigation supplies by restoring the head reach of the LSC. Other major irrigation infrastructure including Warsak, Amandara and Chashma Barrages survived the flood with reparable damage. In Punjab, the breaches at Jinnah and Taunsa Barrages caused the main damage. The highest damage in Punjab occurred to the Taunsa-Panjnad Link Canal and Muzaffargarh Canal in Kot Adu and Muzaffargarh district. The Punjab Irrigation and Power Department reported damage in seven irrigation zones. In Sindh, four breaches in flood protection embankments-the Left Marginal Bund of the Guddu Barrage and the Tori, MS and PB Bunds- caused main damages. The flood caused by the Tori Bund breach inundated almost the entire North West Canal command area (0.49 million ha) and approximately 50 percent of the Beghari Feeder command area (0.40 million ha) and damaged much of the infrastructure on its way back to the Indus River near Sehwan. The other two breaches, downstream of Kotri Barrage, inundated the Pinyari canal system and Thatta district. In Balochistan, the flood from the Tori breach and flash floods from hill torrents damaged irrigation and drainage infrastructure in eighteen districts. The flash floods in AJK, GB and FATA damaged or washed away small-scale irrigation and river training works. Flood damage to WAPDA infrastructure was mainly incurred by the Chashma Barrage, Chasma-Jhelum Link Canal, Chashma Right Bank Canal (CRBC), Raini and Kachhi canals, and Right Bank Outfall Drain.

Damage Quantification

6. The total damage to the irrigation, drainage and flood protection infrastructure has been estimated at PKR 23,600 million (US$ 277.6 million).[109] Infrastructure in Sindh sustained the greatest damage PKR 11,638 million (US$ 136.91 million), followed by KP estimated at PKR 5,810 million (US$ 68 million). Overall, 44 percent of the damage was incurred by canal systems, 36 percent by flood embankments, 10 percent by barrages and headworks, 7 percent by drainage systems and 3 percent by other infrastructure.

Table Annex-10.1: Irrigation and Flood Management - Damage

Provinces/WAPDA	Damage	Indirect Losses [1]	Total
	PKR million		
AJK	14	-	14
Balochistan	2,516	-	2,516
FATA	255	-	255
Gilgit-Baltistan	138	-	138
Khyber Pakhtunkhwa	5,810	-	5,810
Punjab	2,813	-	2,813
Sindh	11,638	-	11,638
WAPDA	416	-	416
Total (PKR million)	23,600	-	23,600
Total (US$ million)	277.6		277.6

[1] *The indirect losses mainly relate to agriculture and livelihoods and are captured in the relevant sectors.*

[109] The damages have been based on the estimated reconstruction cost with a 35% depreciation to reflect the age of the damaged infrastructure.

Proposed Sectoral Recovery and Reconstruction Strategies

7. The DNA revealed the following key sector issues: (i) deferred maintenance of flood embankments resulting in structural failures, (ii) insufficient reservoir/storage capacity to absorb flood peaks, (iii) lack of response mechanisms to early warnings, (iv) need for expanding flood early warning system (FEWS) to cover the Swat and Kabul Rivers and hill torrents, and (v) encroachment of the flood plains and riverine areas. The breaches in flood protection embankments along the Indus River caused the main damage. None of the breaches occurred due to overtopping of the embankments.[110] The aging infrastructure coupled with deferred maintenance necessitates immediate attention to this critical infrastructure.[111] The impact of climate change, expected to cause more frequent extreme flood events in the future, needs to be taken into account while reviewing structural designs, and maintenance requirements and procedures. In addition to the review, a comprehensive inspection protocol for critically important major river training works and embankments (similar to the inspection protocol for dams) need to be introduced.

8. The 2010 flood peaks were significantly higher than the discharge capacity of the Chashma, Sukkur and Kotri Barrages on the Indus River. In the case of Sukkur Barrage, flood passing capacity has significantly reduced due to the choking of several gates. Fortunately, the flood peak, which was higher than the reduced capacity, passed through safely but it might have caused damage to the barrage structure and the guide bunds. Both Kotri and Sukkur Barrages were at high risk of washing away due to sustained water above their capacity for a consecutive seven and fifteen days respectively. Although the 2010 flood event demonstrated that floods higher than design capacity can safely pass through, construction of spillways to improve the safety of these critical structures needs to be considered. Such spillways, together with downstream confined spillway channels, would minimize the extent of flooding in case of extreme floods.[112]

9. Unprecedented flash flood peaks occurred in the Swat River resulting in what was probably the maximum flood in the Kabul River at Nowshera - more than double the highest peak ever recorded at that site in the past.[113] The current FEWS does not cover the Kabul and Swat Rivers and needs to be expanded so that early flood warnings will also become available for these rivers. The FEWS could also be expanded to include major hill torrents. However, the floods in the hill torrents, as well as in the upper reaches of the Swat River are of a flash nature.[114] Therefore, the warning system there would need to be backed by a swift response system to avoid loss of lives and minimize damages. In addition, the Government may need to consider relocating public infrastructure out of high flood-risk riverine areas and refrain from issuing building permits to the private sector in these areas.

10. The 2010 flash floods in KP also triggered river bank erosion at numerous places sweeping away houses and other infrastructure close to river banks, particularly in the upper reaches where rivers are narrow and steep. Due to shifts in river courses, houses and infrastructure that were away from the river bank before the floods have now become exposed to river bank erosion. For such cases, erosion protection works are needed which are included in the medium-term reconstruction program for critical river sections in KP, AJK, FATA and GB. The 2010 floods also demonstrated the vulnerability of the low lying areas, particularly Nowshera and Charsada districts, to extreme floods from the Swat and Kabul Rivers. Critical protection measures such as flood dykes to control spillover of rivers along the lower reaches of the Swat and Kabul Rivers are included in the medium-term reconstruction program.

[110] Most of the embankments provide protection to rural areas in Punjab and Sindh against floods with a return period of 50 to 100 years.
[111] Most of the barrages and river training works on the Indus River and its tributaries are 50 to 100 years old while most of the flood embankments are 30 to 50 years old.
[112] Existing breaching sections in marginal bunds could still be retained so that they could be used in case of an exceptional flood event.
[113] The probable maximum flood is normally used for the design of large dams.
[114] The flashy nature is caused by the topography of their catchments (usually steep slopes) and the environmental degradation mainly caused by deforestation.

11. Although the response time in Punjab and Sindh is longer than in KP due to the longer travel time of the floods, the Government may need to consider the same approach for the unprotected flood plain (katcha) as for the high risk riverine areas in KP, since further infrastructure development in these flood plains would increase flood vulnerability. The settlements in these flood plains are also at risk but their inhabitants get time to evacuate. While building of permanent settlements and infrastructure in the flood plains should be discouraged, forced relocation is not appropriate as the mostly poor inhabitants depend on livelihood activities derived from the river and productive *katcha* lands. However, where social infrastructure such as schools and basic health units need to be re-constructed, flood proofing measures should be considered for their reconstruction. The system of providing early flood warnings to the public and flood preparedness at community level may need to be improved. The Government also needs to clarify its policy towards compensation in case of a flood event for those that opt to use the flood plains for settlement and productive use despite the inherent flood risks.

12. The insurance industry may need to consider flood risks for infrastructure in flood-prone areas. The existing flood plain maps and flood forecasting models of the major rivers should be used to reconfirm or identify the high flood risk areas which should be notified by the Provincial Disaster Management Authorities. For other rivers, high flood risk areas could provisionally be identified based on the 2010 flood event and previous major floods in consultation with local communities.

13. The 2010 floods have also demonstrated the effectiveness of the country's major reservoirs. The already planned reservoirs on the Swat River at Munda, Indus River at Kalabagh and its tributaries would enhance the country's capacity to manage exceptional floods as well as preserve flood water for productive purposes.

14. The above flood management-related issues call for an urgent need to revisit the country's overall flood management strategy and implement a comprehensive long-term multifaceted flood management program. The following elements could be considered for this strategy review: (i) enhancing the absorptive capacity of catchments to prolong run-off concentration time, (ii) building additional reservoirs to absorb flood peaks, (iii) enhancing discharge capacity of the existing barrages and river training works, (iv) adopting a "living with the floods" approach for the riverine areas in Punjab and Sindh, (v) improving and expanding flood forecasting and early warning systems, and (vi) enhancing evacuation and flood relief capacities.

Estimation of Reconstruction Needs

15. The reconstruction strategy considers immediate/short-term and medium-term requirements. Immediate/short term needs include restoring irrigation supplies for the forthcoming winter crops by completing the ongoing efforts to close canal breaches, provisional repairs to structures, de-silting of canals, restoring drainage systems and public tubewells, and strengthening vulnerable and damaged components of the barrages and river training works. Medium-term needs (2-3 years from now) comprise reconstruction of significantly damaged infrastructure including "remodeling" where appropriate. The reconstruction works are for canals, drains and their appurtenant structures; flood embankments; and office and residential buildings. Most of these works do not require new designs. Remodeling may be required for certain critical flood embankments, river training works and barrages. This requires hydrological and river morphological analyses and design reviews.

16. For building-back-safer, the medium-term program also envisages priority flood protection and river training works along the Swat River downstream of Munda Headworks and the Kabul River in the Charsada and Nowshera districts; erosion protection works to protect other settlements and urban areas in KP, AJK, FATA and GB; remodeling of some protection work in the lower planes and expansion of

the FEWS to the Swat and Kabul Rivers and major hill torrents. Feasibility studies, where required, would need to be undertaken during the next 6-9 months.

Table Annex-10.2: Irrigation and Flood Management - Needs

Provinces/Regions/ Institutions	Year 1	Year 2–3		Total
	Reconstruction	*Reconstruction*	*Building-back-safer*	
	PKR million			
AJK	11	10	945	966
Balochistan	1,325	2,547		3,872
FATA	151	241	1,100	1,492
Gilgit-Baltistan	48	164	2,100	2,312
Khyber Pakhtunkhwa	2,842	6,082	42,105	51,029
Punjab	1,469	2,859		4,328
Sindh *	7,162	10,743		17,905
Federal Flood Commission			170	170
PMD			785	785
WAPDA	200	440		640
Total	**13,208**	**23,086**	**47,205**	**83,499**

**Build-back-safer cost is included in Reconstruction costs*

Table Annex-10.3: Irrigation and Flood Management - Prioritized Sector Recovery Framework/Timeframe

Activity	Immediate/ short-term 12 months	Medium- and long-term
Restoration and repairs of damaged infrastructure	**13,208**	
Surveys, designs and studies for remodeling and new protections works		
Reconstruction and remodeling		**23,086**
Build-back-safer in KP, AJK, FATA and GB		**46,210**
Expand FEWS and review Flood Management Strategy		**995**
Total (PKR million)	**13,208**	**70,291**
Total (USD million)	**155.4**	**826.95**

ANNEX-11: TRANSPORT AND COMMUNICATIONS

Background

1. The 796,095-square kilometer area[115] of Pakistan and its 190 million inhabitants[116] are connected through a transport and communications (T&C) network of 259,618 km of roads[117]; 7,791 km of railways; 42 airports; and 34,950 km of telecommunication lines and other infrastructure. The bulk of the transport infrastructure runs North-South (NS) on either side of River Indus and is vulnerable to floods. The 11,800 km long national highways and motorways network is the spine of the primary transport corridor. This is supported by the provincial highways network of 37,400 km that fans out to the districts through 161,000 km of district roads (including farm-to-market and access roads) in rural areas and 54,000 km of municipal roads in urban areas. The national highway system traverses 1,975 km in Sindh; 2,375 km in Punjab; 4,630 km in Balochistan; 1,650 km in Khyber Pukhtunkhwa (KP); and 1,170 km in Gilgit-Baltistan (GB), Federally Administered Tribal Areas (FATA), and Azad Jammu and Kashmir (AJK).[118] About 2,200 km of provincial highways and 25,300 km of district roads (4,900 km paved; 20,400 km unpaved) are in KP; 9,000 km of provincial highways and 67,600 km of district roads (mostly paved) are in Punjab; 9,800 km of provincial highways and 31,900 km of district roads (mostly paved) are in Sindh; and 10,500 km of provincial highways and 20,200 km of district roads (mostly unpaved) are in Balochistan. A total of 5,900 km of provincial highways and 16,000 km of district roads (4,400 km paved; 11,600 km unpaved) are in GB, FATA, and AJK.

2. The railway network of 7,791 km railway lines[119] and 1,100 stations serve the long-distance main NS corridor and connections to other regions including Balochistan. Approximately 4,375 km of railway lines are in Punjab; 1,899 km in Sindh; 315 km in KP; and 1,202 km in Balochistan. Six international airports in major cities serve as hubs connecting to nineteen regular and seventeen feeder and other airports. The telecommunication infrastructure consists of 3,155 exchanges; 34,950 km of optical fiber transmission lines for the landline networks; and 25,554 transmission towers for the cellular telephone networks.[120]

Floods Damage Overview

Damage

3. The reported damage is classified into two broad categories: completely destroyed (CD) and partially damaged (PD). For roads and railways, the data are segregated into lengths of roads and railway lines. For civil aviation and telecommunication infrastructure, the reported damage is more specific. Based on the data received on transport infrastructure damage, a total of seven districts in GB, ten in AJK, , fourteen in Balochistan, twenty-four in KP, eleven in Punjab, seventeen in Sindh and ten agencies in FATA have been affected by the floods. Damage to the road infrastructure varies from the mountainous northern region to the plains in the southern provinces. In GB, KP, FATA, and AJK, the damage is dramatic and much more visible due to the strong flow of rivers that washed away sections of roads, embankments, and structures including bridges. The high speed water-flow eroded riverbanks and bridges, widened rivers that now require longer bridges, and caused landslides that washed away sections of roads now requiring realignment. In the plains of Punjab, Sindh and Balochistan, a number of embankments along the Indus River breached, causing overflow of rivers that inundated vast areas and submerged the road network. The damage to roads has been caused by exposure to high velocity of flood water and inundation. In some cases, water flowed over the road causing severe and long-term damage. Some road sections were washed away by water and in other areas road sections were

[115] Federal Bureau of Statistics, Pakistan
[116] Projection of population by DNA Core Team based on 1981 and 1998 Census Federal Bureau of Statistics Pakistan
[117] Economic Survey of Pakistan 2009-10
[118] Based on the Pakistan Transport Policy Study (JICA, 2006) and information provided by the Government agencies. The sum of these lengths comes out to be 264,200 km (compared to 259,618 km reported by the Economic Survey of Pakistan.
[119] Year Book 2008-09 Ministry of Railways
[120] As reported by the Ministry of Information Technology (MoIT) and Pakistan Telecommunication Authority (PTA).

breached to prevent accumulation of water. Furthermore, given the nature of the transport infrastructure, some damage may still manifest itself at a later date, e.g. further landslides in mountainous areas, sink holes as the water recedes and settling of embankments. A summary of damage to road infrastructure is in Table 1.

Table Annex-11.1: Transport and Communication - Damage to Road Infrastructure

Provinces /Region	Motorways /National Highways (km)		Provincial Highways (km)		District Roads (km)				Municipal Roads/Urban Roads (km)		Total (km)
					Paved		Unpaved				
	CD	PD	CD	PD	CD	PD	CD	PD	CD	PD	
Azad J. Kashmir	7	28			35	1,875	5	1,565	15	46	3,575
Balochistan	-	5	10	357	139	677	-	11.5		878	2,077
FATA	-	-	-	294	13	484	-	466			1,257
Gilgit-Baltitstan	-	33			88	2	155	105			382
Khyber Pakhtunkhwa	208	194	11	248	501	3,009	427	1,547		366	6,511
Punjab	18	35	10	271	75	2,131	-	-	-	279	2,819
Sindh	177	88	58	1,867	122	3,938		2,217			8,467
National	**410**	**383**	**89**	**3,036**	**972**	**12,116**	**587**	**5,911**	**15**	**1,569**	**25,088**

CD = completely damaged; PD = partially damaged

4. Similar to roads, the damage to railway lines involved washing away or erosion of embankments, inundation, and landslides. Bridges and other supporting structures were severely damaged. The administrative divisions affected by the floods include Peshawar, Rawalpindi, Lahore, Multan, Sukkur, Karachi, and Quetta. A length of 382 km railway line was completely damaged while another 842 km was partially damaged. Along the railway lines, eleven stations were completely damaged while thirty-two were partially damaged. The Civil Aviation Authority (CAA) has reported minor damage to four airports in KP, Punjab, Balochistan, and GB. The damaged infrastructure includes runways, fencing and access roads. In telecommunication, major damage to the telecommunication infrastructure involved severing of the optical fiber transmission lines at a number of locations, damage to equipment and feeder cables due to floodwater ponding in exchanges, and in some cases damage to transmission towers and equipment. As reported through the damage assessment regional data, approximately 25,088 km (10 percent) of the total network of roads have sustained damage in the floods.

5. The disruption of the road and rail network has a twofold impact on the mobility of the affected population: returning to the villages is difficult and, once returned, access to markets and basic services is curtailed. Those affected include vulnerable population groups such as women, children, and the extremely poor, who already suffer in pre-flood conditions from restricted mobility for cultural and

financial reasons. While some of the national highways and rail network is expected to be restored in the short-term, the district and municipal roads network will continue to hamper rehabilitation and access to basic services - health, education, markets, public services and communications - in the medium- to long-term.

Data Verification and Validation

6. A two-pronged approach was used for validation. First, field coordinators were mobilized to provinces and regions to verify and validate the reported damage. The field coordinator's verification work was supplemented by members of the Transport and Communications Team (TCT). Given the time, security and mobility constraints, additional resources were mobilized such as project implementation units of various ADB financed projects. The secondary data of each province was validated independently and where the result exceeded ±15%, corrections were applied on the overall assessment of the province. The verification process was also supported by the satellite imagery information requested from the Space and Upper Atmosphere Research Commission (SUPARCO). Damage estimates and reconstruction costs were subsequently updated and finalized.

Indirect Losses

7. The indirect losses due to damage to transport and communications infrastructure are broadly classified into two categories. The first category is loss to road users which include losses in vehicle operations, travel time, transportation of goods, non-performance of services, and so on. Since these losses are time related, they have been capped to three years. The indirect losses have been estimated using a phased recovery period - 20 percent of the facilities recovered within 12 months, 50 percent within 24 months, and only 30 percent of damage reconstruction will continue in the third year. The second category is loss of revenues that is applicable to railways, airports, and telecommunications.

Damage Quantification

8. The Government agencies were given templates prepared by ADB and WB team to report damage. The data are reported in two broad categories: completely destroyed and partially damaged. For roads and railways, the data are segregated into lengths of roads and railway lines. For civil aviation and telecommunication infrastructure, the reported damage is more specific. The road and railway line agencies started collecting data before the DNA's templates were finalized by ADB and World Bank. This preliminary damage information, together with some data based on templates, was analyzed. The bulk of the data was received during the third week of September. The information was analyzed, completely destroyed (damage exceeding 40 percent of the asset value) and partially damaged (40 percent or less). The assumptions made in categorizing the reported damage into the two categories varied for each province or region. In view of a large variety of damage reported by the Government, the partially damaged category for AJK, Balochistan, FATA, GB, and KP has been divided into four bands: (i) up to 4 percent damage; (ii) 4-10 percent; (iii) 10-20 percent; and (iv) 20-40 percent. For Punjab and Sindh, damage is uniform, constituting functional/structural deterioration of the roads as well as localized breaches. The former was categorized as partially damaged while the latter - requiring complete reconstruction - was assessed as completely destroyed. Table 2 presents the direct damage and indirect loss in the transport and communication sector.

Table Annex-11.2: Transport and Communication - Damages and Loss Figures

Provinces/Region	Direct Damage [a]	Indirect Losses	Total
	PKR million		
Roads:			
Azad Kashmir	2,004	937	2,942
Balochistan	1,423	1,799	3,222
FATA	1,617	371	1,987
Gilgit-Baltistan	1,173	84	1,257
Khyber Pakhtunkhwa	18,873	9,821	28,694
Punjab	3,810	11,402	15,212
Sindh	26,864	24,573	51,437
Sub-total	**55,765** [b]	**48,987**	**104,752**
Railways:			
Balochistan	742	282	1,024
Khyber Pakhtunkhwa	756	63	819
Punjab	854	684	1,538
Sindh	1,323	404	1,727
Sub-total	**3,675**	**1,433**	**5,108**
Civil Aviation	56		56
Telecommunication	2,995		2,995
Total (PKR million)	**62,491**	**50,420**	**112,911**
Total (US$ million)	**735**	**593**	**1,328**

a. The direct damages are calculated using depreciated value of the asset.
b. Includes PKR 11,027 million of Motorway/National Highways. It also includes damage to bridges (10% of damages in road sector)

Proposed Recovery and Reconstruction Strategies

Recovery (short-term, within 12 months)

9. The recovery strategy varies for each transport and communication sub-sector depending on the nature of the responsible agency and the importance of the infrastructure. For telecommunication, the private sector operators mobilized quickly, carried out the repairs, and restored the telecom services. For roads and railways, the embankment breaches were plugged, railway line repairs were undertaken, and rail traffic was largely restored. However, more work is needed to strengthen damaged embankments and structures. Repair of minor damage to airports is underway. For the national highways that provide international and interprovincial road connection, landslides debris was removed, bailey bridges were installed on damaged bridge sites, and temporary repairs were carried out to restore traffic. For provincial highways and districts and municipal roads, only minimal work has been carried out on critical sections. In view of the above, the recovery and reconstruction strategies are focused on the road sub-sector. The proposed recovery phase for various categories of roads is described below:

National Highways

10. The National Highway Authority (NHA) has already engaged a consulting firm to assist in the detailed assessment of the damage. The consulting firm is assisting NHA in engineering design, preparation of bid documents for packaging the reconstruction contracts, and in prioritization of the recovery and reconstruction works.

Provincial Highways and Paved District/Municipal Roads

11. The provincial/municipal road agencies should:
    - Start condition surveys for detailed assessment of the damage;
    - Identify minor damage that requires repairs to restore the infrastructure;
    - Undertake the repairs using force account or small contracts. Utilization of local labor will generate much-needed employment opportunities;
    - Prioritize major damage and prepare engineering designs and bid documents for reconstruction;
    - Engage consulting firms to augment the departmental design and implementation capacity.

Unpaved District/Municipal Roads

12. The provincial/municipal road agencies should:
    - Engage local communities in restoration works utilizing labor intensive methods. This will not only create livelihood opportunities but will also help facilitate timely completion of works;
    - If needed, contracts for small works such as cross drainage structures that are beyond the capacity of local communities, can be awarded to local village-based contractors.

Reconstruction (medium- to long-term)

13. The reconstruction strategy, which should be common across all provinces, involves:
    - Ensuring timely preparation of the design and bid documents. This will depend on the capacity of national consultants and effective measures are needed to create incentives for the local consultants to expand their capacity;
    - Assessment of capacity of national contractors and review and improvement of policies regulating the contracting industry;
    - The above includes incentives in the civil works contracts for rehabilitation and reconstruction to reward better performers and penalties for defaulters to ensure implementation;
    - Assessment of the availability of construction materials (such as bitumen/asphalt, cement, steel, etc.) and making provisions including special waiver of policies, if needed, to facilitate imports;
    - Assessment of the availability of skilled and unskilled manpower for construction works and arranging vocational training as needed.

Special Measures

14. The large-scale reconstruction activity that is to be completed in a short timeframe will require special measures. These are discussed below:
    - The reconstruction activity offers opportunities to revive the economy and provide livelihood opportunities for the millions that are internally displaced;
    - The capacity of the government agencies to manage such a massive implementation program could be a bottleneck. Supplementing their capacity by initially outsourcing some of the functions to national (preferably) and international consultants could be one way of mitigating the situation. As their capacity develops, the government agencies should gradually take over these functions;
    - Local inter- and intra-village roads and unpaved tracks could be reconstructed through a participatory mechanism using CBOs under the supervision and technical guidance of local NGOs. Workfare schemes could also be used to generate employment in the recovery phase;
    - Energy availability, such as oil and electricity, is an important requirement for production and

transportation of construction goods and materials and machinery and, therefore, rehabilitation of energy sources should be prioritized;

- The use of explosives, especially in the mountainous north, to create transportation routes is likely to be prohibited considering the security situation. Alternatives should be explored.

Estimation of Recovery and Reconstruction Needs

15. The estimates for rehabilitation and reconstruction are based on the current costs for each item of transport infrastructure. For roads, unit rates applicable to each province and regions were used. The other costs that have been reflected in Table 3 below are: (i) project management, engineering design, construction supervision, and capacity development of the Government agencies, and (ii) escalation during the reconstruction period.

Table Annex-11.3: Transport and Communication - Reconstruction Needs Assessment Summary

Provinces/ Region	Rehabilitation & Reconstruction Costs	Social Safeguards (6%)	Project Management & Capacity Building (8%)	Escalation (12%)[124]	Total
	PKR (millions)				
Roads:					
Azad Kashmir	7,032	422	563	844	8,860
Balochistan	4,843	291	387	581	6,102
FATA	4,337	260	347	520	5,464
Gilgit-Baltistan	3,788	227	303	455	4,773
Khyber Pakhtunkhwa	46,536	2,792	3,723	5,584	58,635
Punjab	19,932	1,196	1,595	2,392	25,114
Sindh	53,339	3,200	4,267	6,401	67,207
Sub-total	**139,805[a]**	**8,388**	**11,184**	**16,777**	**176,155**
Railways:					
Balochistan	3,260	196	261	391	4,108
Khyber Pakhtunkhwa	3,329	200	266	399	4,195
Punjab	3,741	224	299	449	4,714
Sindh	5,790	347	463	695	7,295
Sub-total	**16,120**	**967**	**1,290**	**1,934**	**20,311**
Civil Aviation	-	-	-	-	75
Telecommunication	-	-	-	-	3,744
TOTAL (PKR Million)	**155,925**	**9,356**	**12,474**	**18,711**	**200,285**
TOTAL (US$ Million)	**1,834**	**110**	**147**	**220**	**2,356 [b]**

a. This also includes rehabilitation and reconstruction cost of PKR 22,412 million for Motorways/National Highways.
b. This also includes Telecommunication and Civil Aviation needs of PKR 3,819 million (US$44.9 million) which is a private sector. Excluding this, the public sector needs amounts to PKR 196,466 million (US$2,311 million)

Prioritization Framework

16. Damaged telecommunication, railway and civil aviation infrastructure has been restored or the work is underway to minimize loss of revenues. For roads, traffic has been largely restored on critical national and provincial highway sections although reconstruction still needs to be done. As such, all reconstruction costs for telecommunication, railways, and civil aviation, and 10 percent of the road reconstruction costs are included in the short-term recovery phase for work to be completed within 12 months.

[124] Average of Planning Commission's suggested escalation for three years.

17. The remaining road reconstruction will require careful prioritization to ensure efficient utilization of available resources. The prioritization of road reconstruction may be based on the following criteria:
    - All national highways;
    - Provincial highways connecting major provincial cities to the national highway network;
    - District roads connecting district capitals or major population centers to the provincial highways;
    - District roads providing access to areas of agricultural production or key industries;
    - Municipal roads connecting to major provincial and district roads.

Table Annex-11.4: Transport and Communication - Prioritized Sector Recovery Framework

Activity	Short-term, 12 months[125] (PKR million)	Medium- & Long-term (PKR million)
Emergency Works (for restoration of services and infrastructure)	Railways: 16,120, Telecommunication: 3,744, Civil Aviation: 75, Roads: 22,516 Total: 42,455	
Rehabilitation and Reconstruction		Roads: 117,290
Studies, Surveys, Design, Supervision	3,086	7,829
Social Safeguard Measures	4,323	5,033
Administration Cost	511	1,049
Total (PKR million)	**50,374**	**131,200**
Total (USD million)	**593**	**1,544**

a This also includes Telecommunication and Civil Aviation needs of PKR 3,819 million ($US44.9 million) which is a private sector. Excluding this, the public sector short-term recovery needs are PKR 465,555 million (US$ 547.7 million)

[125] In transport sector, recovery work by One-UN is covered under community infrastructure sub-sector (covering small roads, structures etc)

ANNEX-12: WATER SUPPLY AND SANITATION

M. Ismail Khan

Background

1. Water supply and sanitation (WATSAN) services[126] in Pakistan are exceedingly poor, and fail on three accounts - quality, access, and sustainability of services. Piped water supply is frequently intermittent and not potable; only 35 percent of the population has access, at best for 3-6 hours a day in all but the largest cities. Sewerage services are inadequate with most households not connected to a system; 33 percent of rural inhabitants have no toilet.[127] With no sewage treatment plants or sanitary landfills, the broader urban environment suffers. That little solid waste management (SWM) infrastructure was reported damaged by the flood is testimony to its absence in flood-affected communities.

2. The WATSAN sector in Pakistan is marked by poor governance and inappropriate institutions. Devolution in the early 1990s shifted the responsibility for service delivery to the local governments but they were not provided the skilled staff, management capacity and systems, and operating budgets to do the job.[128] Steps are needed to incentivize WATSAN asset management and service delivery, instead of simply ad hoc construction of "schemes" with no focus on end-user satisfaction or sustainable operations. Public awareness and hygiene education is lacking. Infant and child mortality rates suggest poorer access to satisfactory water and sanitation facilities than is actually the case. There is a pressing need to enhance hygiene practices through proactive hygiene promotion to lower both morbidity and mortality rates.

Floods Damage Overview for Sector

3. ***Nature and extent of damage.*** A total of 82 districts in Pakistan - KP (24), Punjab (10), Sindh (17), Balochistan (13),[129] GB (7), and AJK (10) - plus areas of FATA were affected by the floods. Damage to the WATSAN infrastructure varied from the gravity-based schemes in the mountainous northern region to the pump-driven boreholes or surface water extraction schemes on the plains in the southern provinces. In mountainous districts, damage was severe due to the strong flash flows, particularly in KP and GB where building, machinery and pipework all suffered. At lower elevations, damage from inundation typically affected tubewells (silting and scouring), pumping machinery, electric and electronic equipment, pipe distribution networks, access roads with soling, and sewerage and drainage systems. Some scheme components suffered serious damage and need reconstruction. The majority of the damaged schemes in all districts require rehabilitation, cleaning and disinfection, and repair of damaged components. Table 1 summarizes province-wise the number of damaged water supply systems, including drainage-related infrastructure.[130] In addition to physical damage, WATSAN services, including fee collection, have been disrupted. Productivity losses due to illness and morbidity are inevitable given limited access to potable water and seriously compromised hygienic systems, leading to high risk of waterborne and communicable diseases and infection.[131] Damage to private assets are estimated greater than to public assets.[132] Recovery will depend more on the financial capacity of communities themselves than on official government sources. These communities face multiple challenges - loss of harvests, homes, possessions and, in many instances, livelihood. Against this backdrop, they must replace their household water supplies and sanitation facilities.

4. Even before the floods of 2010, infant mortality rates stood at between 70 and 75/1,000 live births; a large proportion of these deaths were related to water-borne diseases. Rural communities bear a dis-

[126] Groundwater is the predominant water source except in a few large cities where surface water may be used. Most rural inhabitants rely on groundwater such as bore wells and other sources, including springs, shallow wells and rainwater ponds.
[127] Pakistan Social and Living Standards Measurement Survey (PSLM), 2008-2009.
[128] More recently, local governments have been further affected by the absence of elected councils and nazims.
[129] Additional districts were affected by rains.
[130] District-wise estimates of damages are in Volume 2 of the DNA Report.
[131] For more detail, see "Assessment of the Impact of the Floods on Millennium Development Goals (MDGs)" published by UNDP with contributions by other UN agencies.
[132] Damages to private assets comprising household water supply systems and latrines are reported under the housing sector.

proportionate share in this rate. The floods have greatly exacerbated the risks that all communities - including both children and adults alike - face where they are unable to access adequate water and sanitation services.[133] Women are particularly vulnerable during displacement; they lose their privacy and are still expected to collect water for the family and care for the children.

Table Annex-12.1: Water and Sanitation - Physical Damage by Reporting Entity (Number of Schemes)

Provinces/ National	Total Schemes	PHED		Local Government		NGO/Community	
		Water Supply	*Sanitation*	*Water Supply*	*Sanitation*	*Water Supply*	*Sanitation*
AKJ	337	11	0	70[c]	17[c]	0	239
Balochistan	146	146	0	0	0	0	0
FATA	168	168	0	0	0	0	0
Gilgit-Baltistan	56	56[e]	0	0	0	0	0
Khyber Pakhtunkhwa	3,923	795	0	2,017	1,111	0	0
Punjab	1,193	100	2	24	903[f]	1	163[g]
Sindh	1,018	243	84	361[h]	321[h]	7	2
National	**6,841**	**1,519**	**86**	**2,472**	**2,352**	**8**	**404**

[a] Refers to fully and partially damaged schemes; most schemes suffered partial damage except for those in mountainous areas.
[b] Punjab Rural Support Program in Punjab and SAFWCO in Sindh.
[c] Includes damages for 48 water supply schemes and 17 sanitation schemes reported by the Local Government Board in AJK.
[d] Refers to community latrines in AJK.
[e] Data for six of seven districts from Bridges and Roads Division outside Gilgit.
[f] Includes nearly 800 damaged culverts in Punjab.
[g] Includes 438 village development association schemes in 17 Sindh districts; damage data pending.

Damage Quantification

5. ***Quantification process.*** The assessment relied on government reports of damage for public sector infrastructure, primarily from Public Health Engineering (PHE) and the Local Government Departments, and to a lesser extent from Local Councils and NGOs. The data varied in quality, depending on access to damage sites and on the organizational capacity of the provincial government. Where access was reasonably good and a strong coordination office established, the quality of data was better and more readily accessed.[134] In Sindh, where many areas remain inundated, data quality was weak.

6. After obtaining more detailed damage data at scheme level, validation consisted of site visits by team members and/or contracted engineering consultants to review the estimates, document damage and assess reconstruction requirements. The validators were accompanied by PHED and/or TMA staff familiar with the schemes. A validation form was prepared to standardize the reporting process. Based

[133] UN FIMA Report, September, 2010.
[134] The combination of a strong coordination body (the Punjab Urban Unit under Planning and Development), realistic reporting by PHED, and access contributed to relatively better data from Punjab.

on this information, the validators engaged with the government representative on areas of concern. A few minor adjustments were suggested in Punjab. Validation of WATSAN schemes in KP led to a 57 percent reduction in damage value claimed and 52 percent reduction in number of schemes. Sindh PHED assumed 100 percent damage, with apparently no physical inspection possible. After physical inspection in Sindh, validators found damage to PHED schemes overstated by about 66 percent.

5. ***Assumptions and constraints in damage quantification.*** Access constraints limited data validation in FATA, Balochistan, and Gilgit, but these figures are relatively small and do not affect the larger assessment. Based on findings from the validation exercise for PHED schemes in Khyber Pakhtunkhwa, Local Government Department damage values were reduced by 57 percent. Sindh remains a concern as some damage reporting remains desk study-based with many areas still inundated. Sindh figures reported by PHED and local bodies were reduced by 66 percent based on a comprehensive review of damaged schemes reported by PHED.[135] This "expected damage" factor applied to Sindh, aims at a more realistic assessment of likely damage due to inundation, similar to that in Punjab. Further adjustments to Sindh estimates will be needed once the flood waters fully recede, with estimated damage figure likely to reduce.

6. ***Direct damage and indirect losses.*** Direct damages to public assets are estimated at PKR 3,194 million (US$38 million) across some 81 affected districts. Direct damage private assets, reported under the housing sector, are estimated at PKR 4,532 million (US$53 million) on a depreciated basis. Extensive asset loss at household level signals the critical role that the private sector already plays in WATSAN service delivery. Indirect losses measuring the changes in economic flows caused by the flood, are estimated at PKR 6,012 million (US$71 million) over a six-month early recovery period. Indirect loss estimate derives from higher expenditures related to (i) supplying potable water (tankers, cost of hand pumps, water tanks, purification and disinfection processes); and (ii) cleaning wells, sewers, and pipes; and for loss of revenue from interrupted water supply services in urban areas.

Table Annex-12.2: Water and Sanitation - Damage and Loss Figures

Provinces/National	Direct Damage to Public Assets[a]	Indirect Losses
	PKR million	
AJK	249	25
Balochistan	199	298
FATA	42	20
Gilgit-Baltistan	41	12
Khyber Pakhtunkhwa	721	962
Punjab	430	1,405
Sindh	1,512	3,390
National	**3,194**	**6,112**

[a] Reported damages, net of depreciation factor of 35% for public assets.

[135] This figure was based on validation of 100% of PHED schemes reported damaged.

Proposed Sectoral Recovery and Reconstruction Strategies

7. E***xisting sectoral policies, priorities and development programs.*** Provincial policies in water supply and sanitation are in varying stages of formulation and implementation, with greater progress being made in sanitation. Policy implementation remains a challenge; sector investment strategies are absent. There is little emphasis on disaster risk reduction; standard operating procedures to enhance scope for timely, proportionate response to emergencies are lacking. Development programs with external support are primarily provincial or project-focused, covering both urban and rural needs. National programs to install filtration plants at union council level have not succeeded owing to poor planning, design and maintenance. Overlapping mandates of government entities challenge WATSAN sector coordination.

8. Guiding principles for the proposed reconstruction and recovery strategy include:
   - Goal is to re-establish WATSAN services, not simply repair or replace infrastructure.
   - Investment in recovery will be wasted unless the sector has proper management --- skilled service providers to operate and maintain assets, deliver services and recover costs.
   - New models for rural and urban water supply and sanitation services delivery should be customer-focused, performance-driven and financial sustainable.
   - Community-driven approaches require focus on financial and technical sustainability as well; linkages between entrepreneurial know-how and community organization should be explored.
   - Experienced managers, skilled technicians and sound operating systems are essential; private sector expertise should be tapped.
   - Capacity building in the absence of sound management and incentive structures is ineffective.
   - Hygiene education and water conservation are essential.
   - Better disaster preparedness is needed, but in the absence of new management structures, such knowledge is unlikely to be retained or used.

Table Annex-12.3: Water and Sanitation - Recovery Strategies

Province/Area	Variances and Preferences	Common Elements
AJK	• Earthquake resilience a priority • Correct siting of infrastructure and design of sacrificial elements with respect to flash flood essential	• Management models for urban and rural areas require structural changes to ensure effectiveness of recovery investments • Effective management information systems, including accounting, inventory and customer complaints systems needed • Incentivize service providers to monitor water quality, inventory and maintain assets, record and respond to customer needs • Introduce planning and performance monitoring • Harness economies of scale; tap private sector expertise and resources
Gilgit Baltistan		
Khyber Pakhtunkhwa		
Balochistan	• Modular designs if possible to simplify process, accelerate implementation, reduce costs • Rural water supply storage tanks at ground level for earthquake resilience • Earthquake resilience a priority	
FATA	• Limited access and scattered population are challenges	
Punjab	• Opportunity to leverage Geographic Information Systems applications	
Sindh	• More extensive, lengthy inundation necessitates longer transition and reconstruction period	

9. ***Sector capacity assessment and challenges reconstruction/recovery.*** The capacity for repair and reconstruction of WATSAN infrastructure varies across administrative areas and agencies, with PHED having the most and local governments the least capacity for repair.[136] The vast extent of the damage, particularly in areas still inundated or otherwise inaccessible, will challenge implementation. There is limited capacity for maintaining such infrastructure once repaired. Thus, a two-stage strategy for reconstruction, recovery and re-establishing services is recommended as summarized in Tables 4 and 5.

10. ***Following from the guiding principles above,*** the recovery process should begin with clear understanding of the baseline for pre-flood services and WATSAN assets, followed by scheme-specific and community system-specific analysis of damage, with consideration for building back better and smarter -with a view to ensuring that reconstruction enhances overall system performance. Where the current population has outgrown the damaged infrastructure, or where the damaged facility may be redundant, this should be factored into options for reconstruction. Short-term actions also include system de-clogging/cleaning, priority repairs and, most important, review of the models for managing capital investment and service delivery in rural and in urban areas. Re-thinking approaches to managing water supply infrastructure should go hand-in-hand with an expedited program for repair and reconstruction. Strategic packaging of rehabilitation works based on geographical grouping and principles of economies of scale is recommended to expedite implementation. A comprehensive program of hygiene promotion should underpin recovery efforts to develop and inform customer demand for WATSAN services. Short-term priorities are estimated at PKR 3,364 million (US$ 40 million).

11. ***Medium- and long-term priorities.*** Medium- and long-term assistance should build on the strong foundation of baseline service data, asset inventories, build-back-better recommendations and investment plans begun in the first phase. This phase should focus on the bulk of reconstruction, to include formalization of solid waste management schemes in larger urban areas. Although not costed under rehabilitation, selective upgrading of damaged facilities to right-size to current population levels is recommended, based on system planning outputs in phase one. The sector should take this opportunity to make progress on sector policies to enhance access, quality, and sustainability of WATSAN services. This should include the introduction of a WATSAN focal point under Planning and Development Departments to help coordinate and strategize at provincial level. Medium- and long-term priorities costs are estimated at PKR 4,618 million (US$ 54 million).

Needs Estimation of Recovery and Reconstruction Needs

12. ***Building back better for minimal technical improvements - Option 1.*** The estimated costs of physical reconstruction and rehabilitation of WATSAN schemes in the 4 provinces and 3 regions is PKR 6,292 million (US$74 million). Area-wise cost estimates are in Table 4. These costs are based on estimates prepared by PHED and local government staff, adjusted in some cases by results of the field validation findings.[137] The estimates have included a factor for building-back-better with respect to infrastructure, particularly to ensure disaster resilient standards and to upgrade materials to current standards. These factors varied by area, depending on assessment of flood and earthquake potential, being highest in Gilgit Baltistan (17%) and lowest in Sindh (10%). A further 10% was added to account for additional costs of value additions such as HDPE/uPVC (plastic) pipe, flow meters, voltage stabilizers, and electric connections.

13. ***Building back for more sustainability and impact - Option 2.*** Additional estimates have been made

[136] The bifurcated responsibility for assets between local governments in some urban areas and PHED in rural areas has already led to instances of double counting damages.
[137] The validators applied the prevailing composite schedule of rates in the province.

for non-infrastructure related improvements, including initiatives to introduce proper management and maintenance of infrastructure investments. These include preliminary costs related to reorganizing sector management to introduce skilled management, information and accounting systems, staff training, disaster preparedness, service and capital investment planning, energy audits, hygiene awareness, and tariff policy reforms. The additional estimated cost for initiatives to enhance sustainability and impact of recovery investments is PKR 1,690 million (US$20 million), bringing recommended investment in building back better to PKR 7,982 million (US$94 million). In the absence of such initiatives to promote sector reorganization and reform, capital works improvements will not be effectively used to deliver services and are likely to be ill-maintained. Option 2 is the preferred approach.

Table Annex-12.4: Water and Sanitation - Recovery and Reconstruction Needs Assessment Summary

Provinces/ National	Option 1	Option 2 – Recommended Additional Investments			Total Option 2 - Preferred Approach
	Reconstruction and Rehabilitation/ Repair Costs [a]	*Management Systems, Training and Disaster Preparedness*	*Infrastructure Services Planning and Energy Audits*	*Policy and Communication*	
	PKR million				
AJK	487	20	40	6	553
Balochistan	396	25	55	45	521
FATA	83	5	15	3	106
Gilgit-Baltistan	82	5	15	3	105
Khyber Pakhtunkhwa	1,450	40	100	158	1,748
Punjab	866	50	125	250	1,291
Sindh	2,928	55	150	525	3,658
National	**6,292**	**200**	**500**	**990**	**7,982**

[a] Includes PKR 249 million for priority system cleaning, de-clogging and disinfection.

Table Annex-12.5: Water and Sanitation - Prioritized Sector Recovery Framework/Timeframe

Activity	Short-term 12 months	Medium- and Long-term
	PKR million	
Survey of service delivery in affected areas – baseline data	100	
Technical survey – system-specific BBB assessment and subproject packaging, including asset inventory and energy audits	240	
System cleaning, de-clogging, disinfection	249	
Study on WATSAN services management and alternative models for organizing service delivery, particularly in rural areas	40	
Capital investment and service delivery plans, including solid waste management	300	
Public awareness/hygiene promotion program	380	380
Priority water supply and sanitation repair and reconstruction	2,055	
Water supply and sanitation repair and reconstruction		3,988
Emergency response plan preparation and training		20
Support for policy, regulatory and tariff-setting frameworks and awareness		230
Total (PKR million)	**3,364**	**4,618**
Total (USD million)	**40**	**54**

[a] Included in Reconstruction and rehabilitation/repair costs in Table 4.

ANNEX-13: ENERGY

M. Ismail Khan

Background

1. The damage and needs assessment for the energy sector focuses on three main sub-sectors: (i) power, (ii) oil, and (iii) gas. Subsistence fuels (wood and dung) are not included in the scope.

2. Table 1 provides an overview of Pakistan's energy supply. Total primary energy supply for the year ending 30 June 2009 was 62.6 million tons oil equivalent (TOE). Year over year power consumption declined by 4.13 percent to 70,371 gigawatt hour (GWh) due to a shortfall in generation.
LPG = liquefied petroleum gas, TOE = ton of oil equivalent

Table Annex-13.1: Energy- Pakistan's Energy Supply and Consumption 2008-09 (Million TOE)

Descriptions	Gas	*Crude Oil*	*Oil Products*	*LPG*	*Coal*	*Hydel*	*Nuclear*	*Electricity*	*Total*
Indigenous Production	30.24	3.22		0.34	1.67	6.63	0.39		42.49
Import		8.33	10.10	0.06	3.06			0.05	21.60
Gross Supply	30.24	11.55	10.10	0.40	4.73	6.63	0.39	0.05	64.09
Exports and Bunkers			(1.61)						(1.61)
From/(to) Stock		(0.18)	0.24						0.06
Net Primary Supply	30.24	11.37	8.73	0.40	4.73	**6.63**	0.39	0.05	62.54
Transformation and Processing	(2.40)	(11.00)	10.41	0.21					(2.78)
Power Sector	(7.83)		(7.38)		(0.05)	(6.63)	(0.39)	7.46	(14.82)
Non-Energy Use	(3.19)		(0.41)	(0.04)	(0.79)				(4.43)
Trans/Distr & Aux losses	(0.51)	(0.37)	(0.09)					(1.78)	(2.75)
Statistical Diff.			(0.42)						(0.42)
Net Consumption	**16.31**	**0.00**	**10.84**	**0.57**	**3.89**	**-**	**-**	**5.73**	**37.34**

Power Sector

3. In the four provinces and Federally Administered Tribal Areas (FATA), power distribution is carried out by nine PSPs (distribution companies or DISCOs) and one private sector power company - Karachi Electric Supply Company Ltd. (KESC). In Azad Jammu and Kashmir (AJK) and Gilgit-Baltistan (GB), local electricity departments are responsible for distribution and hydro-generation. Transmission is the responsibility of National Transmission and Dispatch Company (NTDC) which also dispatches the power and acts as the Central Power Purchasing Agent.

4. Power generation is provided by thermal plants, hydroelectric facilities and a small nuclear facility (300 MW). The thirteen hydroelectric facilities (installed capacity 6,481 MW) are owned and operated by the Water and Power Development Authority (WAPDA), a public sector entity. Thermal power plants are owned by public and private companies. The public sector operates thirteen thermal power plants (installed capacity 4,900 MW) and buys 250 MW of power from rental power plants. About one-third of Pakistan generation (5,987 MW) is provided by private sector companies (independent power producers or IPPs). Also, KESC operates plants with a total capacity of 1,955 MW. Out of the total 19,252 MW of the national installed generation capacity, dependable generation is about 17,523 MW in the summer and about 14,640 MW in the winter, depending on the annual hydrology.

Petroleum Sector

5. The Ministry of Petroleum and Natural Resources (MPNR) coordinates oil and gas activities.

6. ***Downstream Oil sector:*** Oil refining capacity is 270,000 barrels per day (bbl/day) from five main refineries, Pakistan Refinery Ltd. (PRL), Pak-Arab Refinery (PARCO), National Refinery Ltd. (NRL), BYCO Petroleum Ltd. (BPL), and Attock Refinery Ltd. (ARL). Refineries are primarily owned by the private sector. There are also a dozen oil marketing companies (OMCs). Product distribution is by road tankers (13.5 million tons/year), rail (1.5 million tons/year) and pipeline (6.8 million tons/year). The crude oil and product pipeline network covers over 2,000 km. Total product storage of OMCs can meet twenty-two days of oil demand while total product storage of OMCs, refineries and terminals can meet thirty-eight days of oil demand. There are nearly 6,400 petrol stations nationwide.

7. ***Downstream Gas sector:*** Two state-owned companies, Sui Northern Gas Pipeline Ltd. (SNGPL) and Sui Southern Gas Company Ltd. (SSGCL) distribute about 78 percent of the total natural gas production to consumers. The state-owned Mari Gas Company Ltd. (MGCL) feeds 12 percent while independent systems supply 10 percent. Gas transmission lines span over 10,000 km, and distribution lines another 101,000 km supplying over 5.6 million consumers and power plants. SNGPL owns around 60 percent of the country's gas network with 3.2 million consumers. There are around eighty-four LPG marketing companies and 3,170 compressed natural gas (CNG) stations across the country.

8. ***Upstream Oil and Gas:*** The two main national oil and gas companies, Oil and Gas Development Corporation Ltd. (OGDCL) and Pakistan Petroleum Ltd. (PPL) and various international oil companies and domestic firms operate in the upstream sector. Current oil production is around 66,000 bbl/day. Recoverable gas reserves are 30 trillion cubic feet (TCF). Potential tight gas reserves are about 35 TCF.

Floods Damage Overview for Sector

9. Assessment is based on the information provided by the focal points of the different energy sector agencies under the Ministry of Water and Power (MOWP) and MPNR. The DNA team for energy worked closely with senior staff from the affected companies, and assessed data through desk reviews. Threshold of 40 percent was used to account for assets as completely damaged.

Table Annex-13.2: Energy- Physical Damage Details - Power Sector

Asset Type	Completely Destroyed	Partially Damaged
Grid Stn (no.)	1	31
Transmission Lines (km)	65	96
Distribution Lines (km)	2,799	434
Distribution Trsfmr (no.)	5,299	340
Customer Conn. (no.)	106,299	27,421
Equipment (PKR million)	610	
Hydro Plants[a] (no.)		91
Thermal Plants (no.)		1

(a) Includes 60 micro hydro plants in GB and 15 in FATA, and 6 mini hydro plants in AJK.

10. Most of the direct damage was to the distribution network and the hydroelectric power generation stations. Some transmission lines were also damaged. The three most affected DISCOs service the areas

around Multan (MEPCO), Sindh (HESCO) and KPK (PESCO).[1] WAPDA hydroelectric generation facility damage was primarily to facilities under construction, and will have little impact on current generation capacity. IPPs suffered minimal damage in two plants with a combined capacity of 699 MW. Both plants are expected to be operational before year end. There was also damage to several micro- and mini-hydro facilities which will have little impact on national generation capacity.

Petroleum Sector

11. PARCO's mid-country refinery was shut down owing to a breakdown in logistics for onward products distribution, but suffered limited hardware damage. About 144 km of PARCO's crude oil pipeline and 130 km of PAPCO's product pipeline are under water. Three major depots of PSO are surrounded by water. Several petrol stations have reported damage to equipment, stored oil and civil works. Various segments of natural gas pipelines have been ruptured or are under water, especially in Sindh and Balochistan, with damage to stations and equipment. No severe damage has been reported for LPG and CNG stations. Upstream oil and gas production sites have reported damage in various approach roads, rigs and equipment, well shutdowns due to flooding, additional fuel expenses, and so on.

Table Annex-13.3: Energy- Physical Damage Details - Petroleum Sector

Asset Type	Completely Destroyed	Partially Damaged
Oil Refineries (no.)		1
Site Offices (no.)		2
Oil Pipeline (km)		274
Oil Depots (no.)		3
Petrol Stations[a] (no.)	10	125
Gas Transmission Distribution[b] (locations)		310
LPG Facilities (locations)		1
CNG Stations (locations)	5	10
Oil/Gas Field (sites)		15

CNG= compressed natural gas; km=kilometer; LPG = liquefied petroleum gas.
(a) Indicative assessment. Some of these stations have already been restored.
(b) Major locations include pipeline segments, stations, rural and urban towns/districts, camps, etc. as reported by gas companies.

Damage Quantification

12. Direct and indirect damage estimates were gathered from the relevant companies, who had dispatched personnel to their facilities to gather data. Values were assessed for reasonableness and compared against available pricing data. Direct damage estimates are based on replacement cost. Indirect losses reflect a reduction in earnings due to loss of production or reduced business activity.

[1] Some original damage figures have been revised downwards as water receded and a more accurate assessment was made. For example connections lost for all DISCOs have fallen from an initial value of 530,015 to 133,720.

Table Annex-13.4: Energy- Damage and Loss Figures

Entity	Direct Damage	Indirect Damage	Total Damage	
	PKR million		PKR million	US$ million
Generation	4,511	4,868	9,378	110.3
Transmission	82	0	82	1.0
Distribution	3,056	618	3,674	43.2
Total Power	***7,650***	***5,486***	***13,135***	***154.5***
Oil Downstream	814	3,225	4,039	47.5
Gas Downstream	4,303	1,883	6,186	72.8
Upstream Oil & Gas	417	2,522	2,939	34.6
Total Oil and Gas	***5,534***	***7,630***	***13,164***	***154.9***
National	**13,184**	**13,116**	**26,299**	**309.4**

Power Sector

13. Estimated direct and indirect damage to the power sector from the flood is moderate at PKR 13.1 billion (US$ 155 million), of which direct damage accounts for PKR 7.7 billion (US$ 90.0 million) and indirect damage PKR 5.5 billion (US$ 64.5 million). Most indirect damage is revenue loss due to non-delivery of electricity to the flood affected areas. Some indirect losses were reported due to no hydro-generation during peak flood time in some generation facilities. Some thermal generation plants recorded indirect losses due to the need to switch to more expensive fuel oil because of the non-availability of gas from the Kandhkot gas field. Flooding of two IPPs caused indirect losses due to temporary shut down.

14. The five affected DISCOs were unable to collect receivables from affected areas totaling about PKR 1.7 billion (US$ 20 million). This amount has not been validated and has not been included as an indirect loss but will have a financial impact on the DISCOs.

Petroleum Sector

15. Total reported damage is PKR 13.2 billion (US$ 155 million). Overall damage represents around only 1 percent of the annual oil imports. Reported damage is concentrated in the public sector (about 98 percent), with direct damage of PKR 5.5 billion (US$ 65.1 million) and indirect damage of PKR 7.6 billion (US$ 89.8 million) since the bulk of oil and gas infrastructure is publicly owned.

Social Impact

16. It is estimated that approximately 3.5 million people are without power due to the flood, which is about 3.4 percent of the population with access to power.[2] Anecdotal accounts indicate that loss of power exposed many to the risk of snakebites and affected women and children's sanitation, hygiene and security. Several small and medium enterprises and home-based work and basic social service institutions have been disrupted, resulting in loss of income. For the less populated areas in GB, FATA and AJK serviced by mini- and micro-hydro, the recovery may take longer thereby causing further hardship. Delay in re-establishing services, particularly with the onset of winter, potentially means an increase in the use of fuel wood contributing to further environmental degradation. For the petroleum sector, oil supplies to some power generation facilities and public retail outlets were suspended but are

[2] 538,859 electricity connections were initially reported lost. Assuming 6.5 people/household (Pakistan Social and Living Stds Measurement Survey 2008-09) = 3.5 million people. 58 percent of Pakistan has access to power (Intl Energy Agency 2008), or about 104 million people.

being gradually restored. Gas supplies by SNGPL/SSGCL to over 240,000 people are cut off mainly in Balochistan and Sindh. Generally, however, reasonable levels of services and supplies have been maintained to the affected areas.

Proposed Sectoral Recovery and Reconstruction Strategies

17. The basic recovery strategy for the energy sector is as follows:
    - First priority is to restore basic services.
    - Second priority is to rehabilitate supporting infrastructure.
    - Third priority is restore projects that were completely damaged or under construction.

18. The petroleum sector recovery strategy includes: (i) expedite repair of damaged roads/dedicated rail/bridges which have blocked access to oil and gas facilities, (ii) initiate repair of damaged and vulnerable pipeline segments and associated facilities, (iii) import higher volumes of essential refined products, and (iv) Government to develop policies and standard operating procedures for future emergencies.

19. There is no formal institutional arrangement for risk management and mitigation strategies for the energy sector, although temporarily a Crisis Cell was formed in Ministry of Petroleum and Natural Resources (MPNR) to review and monitor damage and recovery. There is no comprehensive integrated Energy Sector Policy in Pakistan. Also there is no existing disaster risk reduction or climate proofing program for the energy sector.

20. Pakistan's development priorities are given in Vision 2030[3] and the Medium Term Development Framework (MTDF) for 2005-10 provides for priority investment in key sectors. There are annual development programs, i.e. Public Sector Development Program (PSDP) for all the PSPs. Special development funds are also available for new village electrification and improvement of oil logistics.

21. In the power sector, Asian Development Bank (ADB), Islamic Development Bank (IsDB), Japan International Cooperation Agency (JICA), and the World Bank have traditionally been the major donors providing sizeable funding to assist energy infrastructure development. The United States Agency for International Development (USAID) has increased its assistance in recent years. There is no major donor-assisted program for the petroleum sector. ADB assists with renewable energy development, power distribution and transmission networks, and energy efficiency improvement. The World Bank and JICA focus on power transmission and distribution networks, while USAID concentrates on infrastructure development. IsDB's focus has been hydro-generation, and increasingly on thermal generation. Other donors, including France, Germany, Republic of Korea, the Netherlands and the United Nations Development Programme (UNDP) support energy efficiency and renewable energy projects.

22. The energy sector is federally-based and policies, rules, pricing, projects and implementation issues are coordinated by the respective federal department, except in AJK, GB, and the Sarhad Hydropower Development Organization (SHYDO) in KP. Power sector companies have redirected their internal resources to begin restoration work. Petroleum companies are replacing and restoring affected facilities in coordination with MPNR. Challenges to power sector development include: (i) inadequate financial resources, (ii) insufficient quantities of equipment and stores, (iii) week domestic manufacturing capacity to supply required equipment, (iv) reconstruction prioritization, and (v) financial strain from damage.

[3] Government of Pakistan, Planning Commission. 2007. Vision 2030. Islamabad

Table Annex-13.5: Energy- Recovery and Reconstruction Needs Assessment Summary

Entity	Reconstruction and Rehabilitation/Repair Costs[4]	Capacity Building	Total	
	Million			
	PKR		*PKR*	*USD*
Power	5,422	850	6,272	73.8
Petroleum	2,766	-	2,766	32.5
National	**8,188**	**850**	**9,038**	**106.3**

Estimation of Recovery and Reconstruction Needs

23. The cost to meet the immediate needs for the power sector is PKR 5.4 billion (US$ 63.8 million) covering direct damage suffered by PSPs. For the petroleum sector the cost is PKR 2.8 billion (US$ 32.5 million) covering direct damage suffered by public sector companies (net of insurance). Insurance cover for public sector companies has not been factored into needs. Capacity building requirements include US$ 3 million to develop SOPs for disaster management (policy), US$ 3 million to climate proof existing/new projects, and US$ 1 million each for GB, AJK, FATA, and KP-SHYDO.

24. Opportunities to Build Back Better are few as most programs involve rehabilitation of existing infrastructure rather than building new facilities. Three potential opportunities are:
    - Purchase "trash removal cleaning machines" to help hydro facilities clear debris and bring them on-stream faster after future floods. Two sites identified are Warsak and Chasma.
    - Replace damaged customer meters with "smart meters".
    - Climate proof civil works.

Prioritized Sector Recovery Framework/Timeframe

25. For the ***power sector***, a phased framework is provided below:

Policy Actions

- Formulate policy for unrecovered receivables from customers in the affected areas.
- Formulate policy for compensation to PSPs for providing free electricity to flood affectees.

Early recovery, short-term (<= 12 months)

- Fast-track infrastructure restoration by diverting resources to restoration activities in the flood affected areas, utilizing existing stores and existing civil works contractors.
- Reconstruct, repair and rehabilitate damaged facilities. Where appropriate Build Back Better.
- Fast-track procurement for continuous replenishment of equipment to stores.
- Provide free solar lanterns to affected areas where power has been disrupted.
- Provide renewable energy systems to provide power to communities that are cut off.
- Establish emergency SOP including disaster management, stores back-up, prioritization, costing, providing renewable power equipment as emergency supply to cut off areas.

[4] Excludes (i) private sector reconstruction, and (ii) cost of WAPDA hydro assets rehabilitation that are under construction and petroleum sector facilities as these facilities are insured. Details of the insurance coverage are unknown at this time.

Medium-Term (0 - 24 months)

- Implement SOP for emergencies.
- Accelerate implementation of national compact fluorescent lamp program in affected areas in order to reduce power demand and offset generation shortage.
- Audit stores used for restoration.

Long-term (> 24 months)

- Carry out long-term development planning for power generation, transmission and distribution improvement program, increase power supply coverage, explore alternate sources of energy.
- Promote long-term sustainable development.
- Develop and implement improved safety standards and building codes.

26. For the ***petroleum sector***, a phased framework is provided below:

Policy Actions

- Determine policy for payment of losses to public sector companies for relief operations and damages.
- Determine policy for payment of unrecovered receivables from affected gas customers to public sector companies.

Early recovery, short-term (<= 12 months)

- Fast-track restoration of roads and rail infrastructure to oil and gas facilities and retail outlets.
- Reconstruct, repair and rehabilitate damaged logistics facilities including PARCO pipeline.

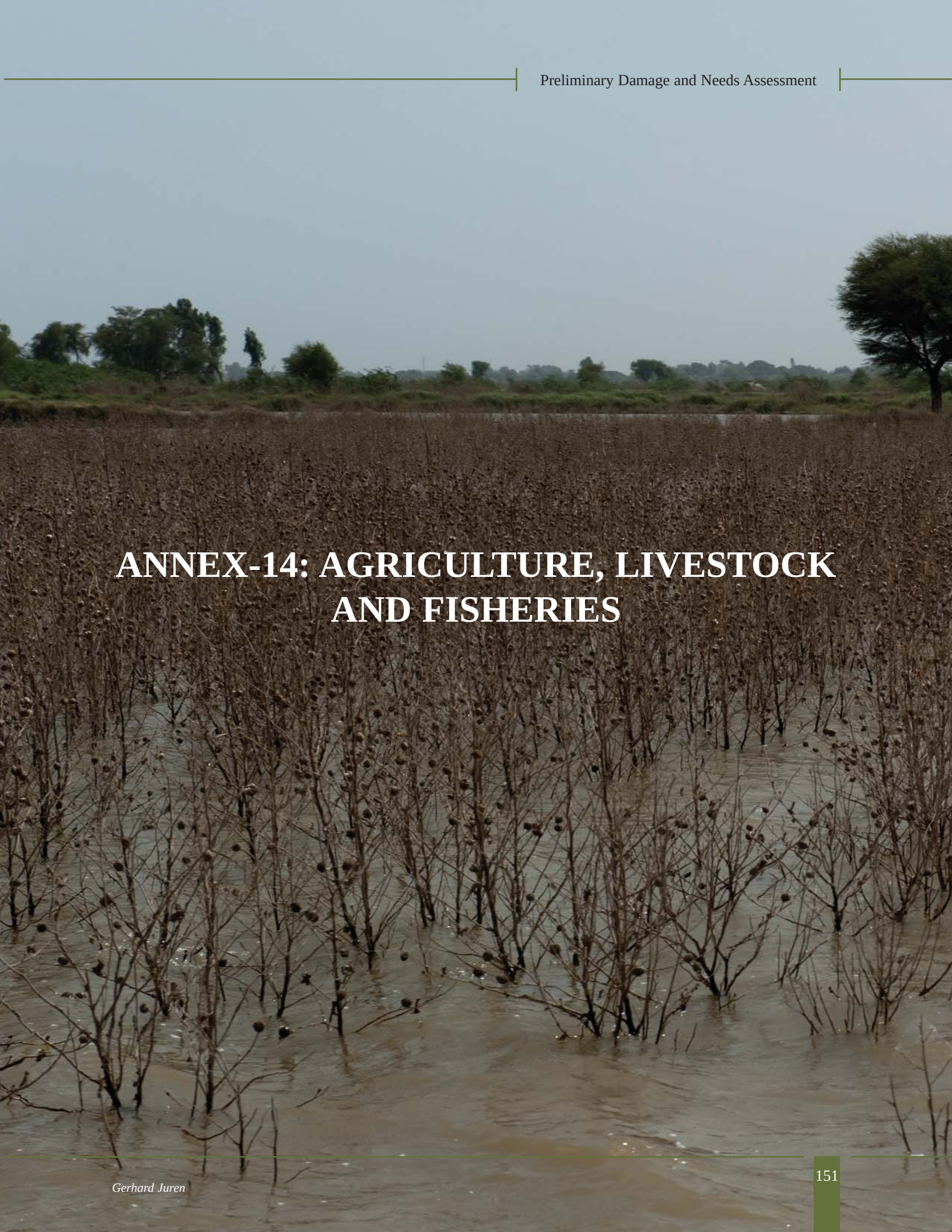
Medium-Term (0 - 24 months)

- Establish emergency SOP and outline mitigating strategies.
- Accelerate projects to remove oil logistics bottlenecks and fast-track projects in the pipeline.

Long-term (> 24 months)

- Develop strategy for more robust refining and marketing, and gas distribution infrastructure.
- Develop a plan to reduce oil imports. Accelerate implementation of LNG import facilities.
- Develop a strategic stock policy to maintain adequate oil stocks for emergency situations.

ANNEX-14: AGRICULTURE, LIVESTOCK AND FISHERIES



Gerhard Juren

Background

1. Agriculture accounts for 21 percent of GDP, 45 percent of employment and 60 percent of exports. The main crops are wheat, cotton, rice, sugarcane, maize and pulses. Commercial production of fruit and vegetables, particularly for the main urban markets, has increased rapidly in recent years, particularly close to major cities, or where agro-climatic conditions are particularly favorable such as parts of Balochistan and Khyber Pakhtunkwa (KP). The majority of small farmers cultivate their own lands but a substantial proportion are share croppers, many of them "tenants at will" with no acquired rights. In southern Punjab and Sindh, a number of land holders are operating large commercial farms, particularly fruit orchards. Livestock forms an integral part of the farming system and for many farmers it is their main asset. Buffalo and cattle are mainly kept for milk. Most farm families typically have sheep, goat and poultry for home consumption as well as for sale. In recent years, there has been a rapid growth of medium- to large-scale commercial enterprises in dairy and poultry, mainly to supply the needs of urban areas. Pakistan's fisheries sector produces about 1 million tons of fish products annually - two-thirds of this is from marine sources. In recent years there has been a rapid increase in aquaculture with many farmers using small ponds and other water bodies.

Floods Damage Overview for Sector

2. ***Overview of Damage.*** In the more hilly areas affected by flash floods, mainly in AJK, GB, KP and Balochistan, the rapid and unexpected flow of water swept away people, houses, crops, livestock and stores of feed, food and seed. In the plains, the heavy flow in the Indus caused floods of over two meters in some area. Crops were destroyed but as the floods were slow moving, most people were able to relocate themselves, their valuables and livestock to higher areas. The floods also damaged on-farm water channels and tube wells. In some areas the silt deposited is very heavy, and the entire alignment of irrigation and drainage systems may need changing.

3. ***Crops.*** The floods had a devastating effect on crops. As shown in Table 1 below, a total of about 2.1 million ha of standing crops of Kharif have been affected - mainly cotton, rice, sugarcane, and vegetables. This resulted in loss of 7.5 million tons of sugarcane, 2.5 million tons of rice, 0.8 million tons of vegetables, 0.7 million tons of cotton and 0.3 million tons of maize. Around 1.0 million tons of household food and seed stocks, predominantly wheat, have been lost. In addition, a substantial amount of government wheat stocks are reported to have been washed away or spoiled by floods, rain and humidity. Despite some increase in water availability and soil fertility due to silt and groundwater recharge, there is a possibility that production in coming seasons, in Sindh as well as parts of southern Punjab, will be affected negatively by continued flooding and problems of land preparation and inputs. Wheat production may reach only 20 million tons as opposed to an average production of almost 23 million tons in the last three years. There is concern about the possible impact of reduced wheat output in the coming season on food security.

4. ***Livestock.*** Substantial numbers of livestock were killed during the flash floods in the hilly areas of KP and Balochistan. Particularly significant losses occurred among the large sheep and goats flocks in Balochistan. In the plains areas, due to advance warning, farmers were able to move much of their animals. However, this was not always possible due to difficulties in herding grazing animals and poultry. A number of farmers moving away from flooded areas found themselves without money to buy food and other essentials, and with limited access to feed and fodder for their animals. These farmers sold their animals, often at very low prices. In the coming months, livestock productivity is expected to be low due to problems of feed, fodder and clean drinking water, as well as possible disease outbreaks. However, livestock production is likely to revive rapidly due to improved grazing conditions resulting from better soil conditions.

Table Annex-14.1: Agriculture and Livestock- Physical Damage

Descriptions	AJK	Balochistan	FATA	Gilgit-Baltistan	Khyber Pakhtunkhwa	Punjab	Sindh	National
Crop Area Damaged (thousand ha)	33.1	132.5	7.22	7.9	121.5	746.9	1,043.5	2,092.64
Large Animals (thousand)	0.3	139.6	6.2	1.3	72.4	2.3	93.7	315.61
Small Animals (incl. sheep, goat) (thousand)	0.3	1,036.7	8.4	10.8	67.8	2.5	81.9	1,208.38
Poultry Perished (thousand)	11.7	625.5	101.2	12.9	621.3	2,012.0	6,895.1	10,279.73
Fishery /Ponds lost (PKR million)	n/a	n/a	-	n/a	13.03	319.07	48.9	380.94
Water-courses Damaged (No.)	657	47	n/a	960	1,790	2,598	6,990	13,042
Household stocks of Food, Seed & Feed (PKR million)	75.1	1,590.3	n/a	19.1	6,721.6	35,804.5	10,488.1	54,698.62
Agriculture machinery, tools (PKR million)	n/a	57.9	n/a	n/a	85.4	4,535.8	112.8	4,791.90
Govt. buildings, Infrastructure facilities (PKR million)	n/a	15	n/a	n/a	247.2	1,463.8	1.2	1,727.10

Large Animals= Cattle, Buffaloes, Camel, Horse, Donkey
Fishery /Ponds Lost in FATA included in estimates for Khyber Pakhtunkhwa

5. ***Other Physical Damage.*** Damage to fisheries has been reported from Punjab and KP where fish farms, hatcheries, boats and gear were destroyed. Some 13,042 watercourses were fully or partially damaged with majority in Punjab, Sindh, and KP. The floods damaged the concrete and brickwork structures, as well as the machinery and boreholes, associated with 113,000 tube wells. A number of animal health, and agriculture and livestock research and extension offices were damaged by the floods in Punjab, Sindh, and KP.

Damage Quantification

6. ***Data Sources and Validation. T***he assessment is based on the primary damage data compiled by provincial governments, agricultural and livestock census data, and the information collected by the DNA Team itself. The primary data on livestock and crop losses provided by the provincial governments was validated through multiple approaches including process checking of the government system used for data collection, visiting some heavily-affected districts for spot checking and interviews, and also comparing provincial data with data provided in studies carried out by other agencies and organizations. In addition, the crop data was compared with data collected using SUPARCO satellite imagery.

7. The members of the DNA team travelled to all four provinces except AJK and GB, met with officials of line departments, and assessed the data provided to the team. Team members also visited Muzzafarghar and Multan districts in Punjab, and Badin district in Sindh for spot-checking and validation. Because of security restrictions, team members could not travel to districts in KP/FATA and Balochistan and their visits were confined to Peshawar and Quetta only. The team also compared

provincial crop and livestock loss figures with survey results conducted by PARC, NRSP, FAO and the report of the Ministry of Livestock and Dairy Development. The data on damaged crop area provided by Punjab was around 14 percent higher than SUPARCO data, and that of Sindh was 10 percent higher than SUPARCO data suggesting that the provincial data were of reasonable accuracy.

8. **Quantification of Direct Damage and Indirect Losses.** The summaries of preliminary damage estimates are provided below. As shown in the table below, the total damage in crop and livestock sub-sectors is estimated at US $5.04 billion, of which 74 percent is in the form of direct damage and 26 percent in the form of indirect losses. Among the provinces, Sindh suffered most with 46 percent of total damage, followed by Punjab (36 percent), KP and Balochistan (8 percent each), and remainder divided between FATA, Gilgit-Baltistan and AJK. The losses were largest in the crops sector, which includes estimates of damages to Kharif crops; food and seed stocks; irrigation facilities; and support services for crops, as well as indirect damage to the forthcoming Rabi 2010/11 and Kharif 2011 crops. Livestock damage, which includes loss of animals, distress sales, and destruction of animal health support services, as well as indirect damage due to reduced milk production, accounts for 11 percent of total damage. Fisheries losses are estimated at around US$ 4.5 million.

Table Annex-14.2: Agriculture and Livestock- Estimated Direct and Indirect Losses

Province	Livestock			Crops			Fisheries / Pond Damage	Total
	Direct Damage	*Indirect Losses*	*Sub Total*	*Direct Damage*	*Indirect Losses*	*Sub-Total*		
	PKR million							
AJK	16.15	0.00	16.15	1,469.65	579.70	2,049.35	n/a	2,065.50
Balochistan	12,284.20	1,842.80	14,127.00	18,655.80	3,472.25	22,128.90	n/a	36,255.90
FATA	571.20	317.90	889.10	920.55	1,303.05	2,224.45	0.00	3,113.55
Gilgit- Baltistan	168.30	0.00	168.30	1,459.45	238.85	1,697.45	n/a	1,865.75
Khyber Pakhtunkhwa	5,277.65	4,366.45	9,644.10	16,031.85	7,944.10	23,975.95	12.75	33,632.80
Punjab	2,102.90	5,191.80	7,294.70	115,242.15	33,378.65	148,620.80	318.75	156,235.10
Sindh	7,394.15	8,621.55	16,015.70	133,571.55	46,001.15	179,571.85	48.45	195,636.00
Total	**27,815.40**	**20,339.65**	**48,155.90**	**287,351.00**	**92,917.75**	**380,268.75**	**380.80**	**428,805.45**

Fisheries /Ponds Lost in FATA included in estimates for KP
Note: Total livestock lost due to flood represents about 1 percent of total national stock and in value terms it is about 11 percent of total sector loss

Proposed Sectoral Recovery and Reconstruction Strategies

9. ***Existing Sectoral Policies and Priorities.*** Agriculture in Pakistan has to play a stronger role and there is a need for strategic interventions to raise productivity. Also with much of the poor and vulnerable living in rural areas, agriculture development will be key to meeting the MDGs. The Medium Term Development Framework (MTDF) 2005-10 sets out the main objectives of agricultural development as the achievement of self-reliance in agricultural commodities, ensuring food security and productivity improvement of crops. During the period for the MTDF, an annual growth rate of 5.2 percent is projected. To achieve the objectives, the MTDF proposes strengthening of agricultural research and extension; enhancement of crop productivity; increased production and export promotion of high value crops; and development of additional water storage capacity and efficiency. For livestock, the MTDF's strategy is to increase productivity by placing emphasis on quality rather than number of animals.

Raising growth and reducing poverty in rural areas would require a higher level of public investment and major donors should assist the Government in pursing its key policy changes and leveraging public spending on the sector.

Guiding Principles for Recovery and Reconstruction

- ***Focus on Poverty Reduction and Sustainable Livelihoods.*** Efforts must be - and must be perceived to be - socially equitable with support being targeted mainly to vulnerable groups living in the flood affected areas. This should include social and vulnerability analysis with special emphasis given to gender aspects.
- ***Create a Leading Role for Local People and Their Organizations.*** Rural communities should play a central role and take responsibility for planning and implementing. Cash-for-work and food-for-work programs should apply to the rehabilitation of public infrastructure, but also target those people who prefer to restart their own economic activities immediately.
- ***Allow Markets to Lead Recovery.*** Markets must be left to play a key role in guiding existing and renewed productive patterns. This will be essential to ensure that the reconstruction effort builds on the natural and entrepreneurial assets of the affected areas.
- ***Resource and Environmental Management.*** The floods and their impact have highlighted problems with resource management and it is essential that reconstruction efforts address these issues.
- ***Build on Past and On-Going Projects and Programs.*** Agriculture, forestry and the water sector have benefited from a long series of projects and programs. This experience needs to be quickly mobilized - possibly through reallocating funds and staff from ongoing projects and programs.

10. ***Meeting Food Security Needs of the Poor.*** There is also a need to review the system used by Government to place stocks on the market; this may not be effective in reaching the poor who have lost food stocks and income. The Government should therefore consider free distribution of wheat in some of the worst affected areas, possibly using NGOs, WFP and UNHCR systems.

Needs Estimation of Recovery and Reconstruction Needs

In close consultation with provinces, a set of reconstruction interventions has been identified:

11. ***Key Intervention Area 1: Restoring Normalcy - Cost Estimate PKR 55.2 billion (US$ 650 million).*** In the coming months, all efforts must be on saving the Rabi 2010/11, as well as future cropping seasons. At the same time there has to be an effort to safeguard and rebuild livestock herds. Needs estimation for the agriculture sector has been done for the three scenarios in Table 14.3:

(1) Low Compensation Scenario

Crops (up to June 2011): Small- and medium-size farmers with up to 10 ha of land will be provided with essential inputs (seed, fertilizer, and land preparation costs) for wheat in the upcoming Rabi season. The subsidy amount would be equivalent to about 80 percent of total expenses needed for sowing on one ha of land.

Livestock (for up to 2 years): Those living below the poverty line will be provided compensation of around 2-3 small animals or one large animal; this compensation would be equivalent to about 50 percent of animal losses they had endured during the flood.

On-Farm Water Management (up to 2-3 years): 40 percent of the total damaged watercourses along with associated infrastructure will be rehabilitated.

Fisheries (up to 2 years): Around 50 percent of the total recovery needs of the fishing communities will be provided for in the form of subsidies.

(2) Medium Compensation Scenario

Crops (up to June 2011): Small- and medium-size farmers with up to 10 ha of land will be provided with essential inputs (seed, fertilizer, and land preparation costs) for wheat in the upcoming Rabi season. The subsidy amount would be equivalent to about 80 percent of total expenses needed for sowing on three ha of land.

Livestock (for up to 2 years): Those living below the poverty line will be compensated for 50 percent of their lost animals (same as previous scenario); in addition those living above the line will be compensated for about 30 percent of their total lost animals.

On-Farm Water Management (up to 2-3 years): 60 percent of total damaged watercourses along with associated infrastructure will be rehabilitated.

Fisheries (up to 2 years): Around 50 percent of the total recovery needs of the fishing communities will be provided for in the form of subsidies.

(3) High Compensation Scenario

Crops (up to June 2011): Small- and medium-size farmers with up to 10 ha of land will be provided with essential inputs (seed, fertilizer, and land preparation costs) for wheat in the upcoming Rabi season. The subsidy amount would be equivalent to about 80 percent of total expenses needed for sowing on five ha of land.

Livestock (for up to 2 years): Those living below the poverty line will be compensated for 50 percent of their lost animals (same as previous scenario); in addition those living above that threshold, will be compensated for about 50 percent of their total lost animals.

On-Farm Water Management (up to 2-3 years): 80 percent of the total damaged watercourses along with associated infrastructure will be rehabilitated.

Fisheries (up to 2 years): Around 50 percent of the total recovery needs of the fishing communities will be provided for in the form of subsidies.

12. **Possible Implementation Arrangements.** The focus of assistance should be to rebuild the livelihoods of poor families (including women-headed), who are likely to have severe problems in obtaining machinery, equipment and inputs needed to clear their fields and cultivate them. In providing targeted supplies to poor farmers, local NGOs and others with the required skills and capacity, could play a key role. It is also essential that local suppliers and traders be drawn into the distribution system by the use of vouchers wherever practical and possible. The Punjab Government has already started a scheme for distribution of seeds to farmers based on the use of a special ATM card issued to flood refugees at refugee camps. Use could also be made of "Watan Cards" issued by NADRA to flood affectees.

13. **Key Intervention Area 2: Improving Key Policy and Regulatory Frameworks - Cost Estimate PKR 1.7 billion (US$ 20 million).** As the rural population return to their lands and restart economic activity, there are a number of issues that will need careful attention. These issues, along with possi-

ble solutions, are discussed below:

Land Use in Riverine Areas. In recent years there has been wide scale allocation of the flood plains to farmers for grazing and cultivation of fodder. Although no permanent structures were allowed, however, over the years permanent houses, bunds and polders have been constructed in these areas. These developments not only place people's lives and livelihoods at risk but constrict the passage for the flow of flood water. An improved flood management plan, along with an early warning system, will be proposed by the team working on irrigation. It is essential that these be complemented by agriculture zoning laws and regulations with suitable arrangements for oversight and implementation.

Land Ownership. In some areas there are likely to be problems with land ownership and boundaries. This may occur, for example, where the river has changed its course, removing or adding lands, or where traditional land boundaries such as trees, ditches and ridges have been destroyed or covered by silt. A speedy dispute resolution mechanism, based on Village Committees or Union Councils has to be set up to address this.

Tenancy Agreements. Under traditional "tenancy-at-will" share cropping arrangements, farmers are expected to provide 50 percent of seed and fertilizer. It has been suggested that input distribution packages be carefully targeted to the poorest farmers to enable them to meet this obligation. However, it may not be possible to fully cover all the poor and landless farmers. If such farmers are not allowed access to land production, as well as social order, may be jeopardized. Provincial governments should

Table Annex-14.3: Agriculture and Livestock- Estimated Costs for Recovery and Reconstruction[142]

Key Intervention Area 1: Restoring Normalcy and Rebuilding Agriculture and Rural Livelihoods	Low Cost Option	Middle Cost Option	High Cost Option
	PKR million		
A. Crops Seed/fertilizer/land preparation/ tools and implements for Rabi 2010/11 and for Kharif 2011	13,685.00	38,505.00	64,090.00
B. Livestock Restocking, Feed/medicine, Animal shelters	2,465.00	10,880.00	16,490.00
C. Fisheries Repair of fish hatcheries and Stocking of ponds	229.50	229.50	229.50
D. On-Farm Water Management Repair of damaged infrastructure (watercourses, tube wells, etc.)	3,745.10	5,610.00	6,545.00
Sub-total	**20,179.00**	**55,224.50**	**87,434.40**
Key Intervention Area 2: Strengthening Key Government Policies Related to Management of Flood and Riverine Areas	**1,700.00**	**1,700.00**	**1,700.00**
Total Program Costs	**21,879.00**	**56,924.50**	**89,134.40**

[142] The team has done costing for addressing the development constraints in the flood affected areas. Refer to volume 2 for details.

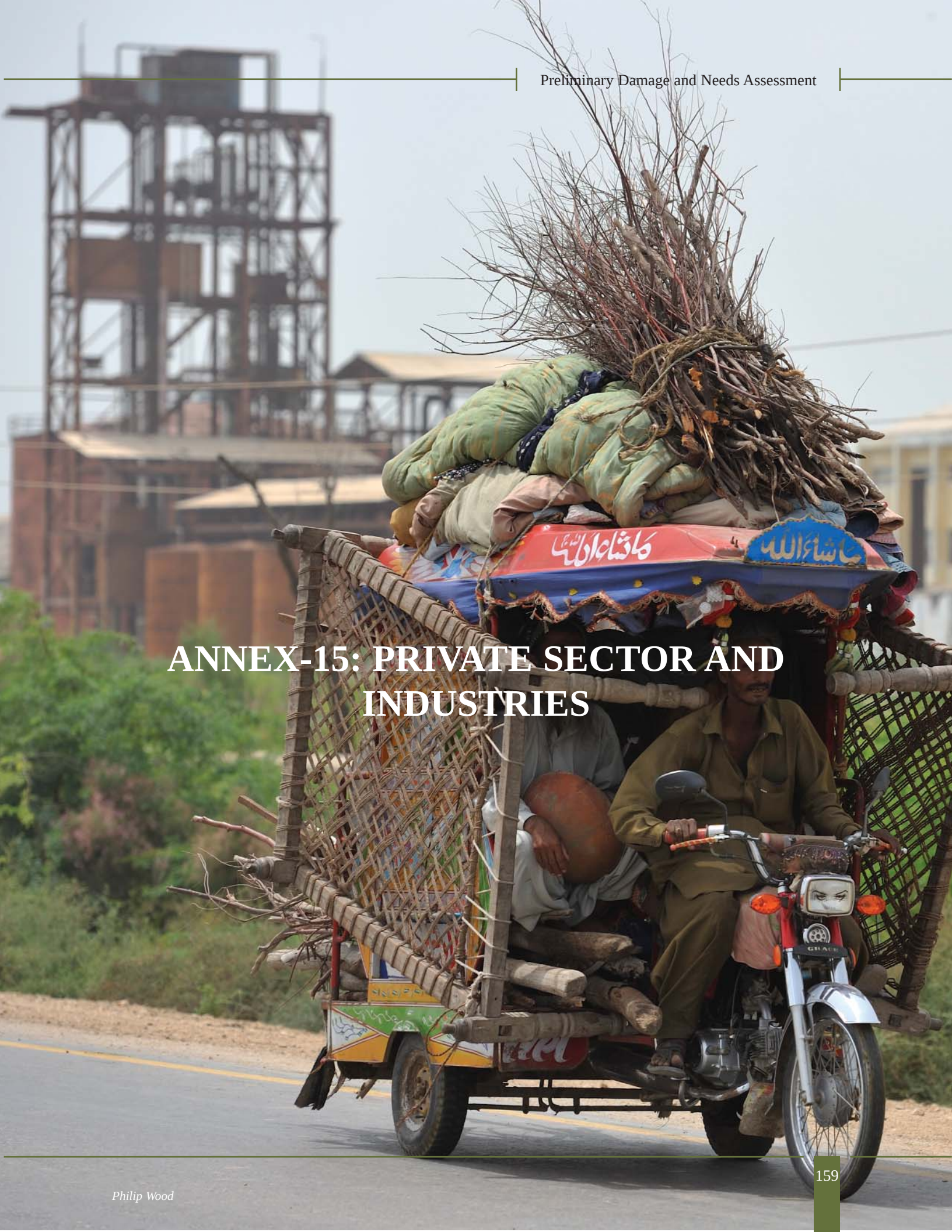
announce directives that tenant farmers displaced by the floods be allowed to return to their lands and District and Union Council officers will need to monitor that such farmers are not displaced.

Agricultural Trade Policies. As mentioned above, there may be shortfalls in domestic availability of food and other agricultural commodities due to the impact of the floods on the current Kharif crop as well as on the Rabi crop. Import policies will need to be liberalized go enable traders to import essential food, feed and equipment.

Table Annex-14.4: Agriculture and Livestock- Estimated Costs for Key Intervention Area 1

Province/Region	Low Compensation Scenario	Medium Compensation Scenario-Preferred Option	High Compensation Scenario
	US$ million		
AJK	5.17	13.36	21.57
Balochistan	49.07	132.60	189.94
FATA	1.41	4.69	7.50
Gilgit-Baltistan	2.57	5.69	8.35
Khyber Pakhtunkhwa	23.26	67.34	106.90
Punjab	59.67	159.64	262.01
Sindh	96.29	266.45	432.37
Total	**237.44**	**649.77**	**1,028.64**

ANNEX-15: PRIVATE SECTOR AND INDUSTRIES



Philip Wood

Background

1. Recent floods have significantly damaged the private sector in the four provinces and the three special regions of the country. While the major industrial hubs of the country (Karachi, Lahore, Faisalabad, etc.) have largely been spared, the flooding has seriously damaged micro-, small and medium enterprises in the manufacturing, trade and service sectors in the affected districts. In Punjab and Sindh, cotton ginning, oil expulsion, rice processing, vegetable oil processing, flour mills and cold storages are the major sectors in the affected districts. Some large industrial units like sugar, textile spinning, fertilizer and cement also exist in these districts. Along with the manufacturing sector, small shops in the informal sector play an important role in the economies of the affected districts in Punjab and Sindh. In Khyber Pakhtunkhwa (KP) and FATA, the floods have exacerbated the already existing conflict situation. The SME profile of the affected districts of KP comprises of flour mills, marble processing units, cement products manufacturing units, match factories, furniture manufacturing units, pharmaceutical and footwear units, along with some large cement manufacturing units. In addition to manufacturing, the mining and tourism sectors and agro-based sectors like horticulture, fisheries and apiculture are important contributors to economic activity in KP. In FATA, the economic profile of the affected areas mainly includes marble mining and processing units. Along with these, a large number of enterprises are engaged in wholesale and retail trade in KP and FATA. In Balochistan, there are very few industrial units in the affected districts. The most common SME sectors are rice processing, flour mills and ice factories; as well as small shops and trading enterprises. In Azad Jammu and Kashmir (AJK), the private sector mainly comprises of micro and small enterprises; along with some small textile weaving and furniture manufacturing units, flour mills, small shops and hotels. In Gilgit-Baltistan (GB) the private sector comprises of micro- and small enterprises in tourism, horticulture, gems and minerals, and trading. There are few formal industrial units such as flour mills, and few fruit processing/packing plants.

Baseline Data

2. For the damage needs assessment of the private sector, four main types of enterprises were considered: industrial establishments, retail shops, hotels and mines. Since the majority of private sector enterprises in the affected districts were from the informal sector, accurate baseline data of the affected enterprises was not readily available. For industrial units in the affected districts, the baseline numbers were taken from the provincial directories of industrial establishments. For retail shops, baseline numbers were calculated using Economic Census 2005 data; using an assumption based approach. The total number of retail shops in 2005 was extrapolated by the population growth factor of 2 percent to arrive at the figure of 1,799,992 shops in the country. Population percent of each district was applied on the total number of shops to obtain district-wise baseline number of shops. For FATA, Gilgit-Baltistan and AJK, baseline numbers of shops were calculated using per capita shop value in KP as reference. For the hotel sector, only three districts of KP, Swat, Abbotabad and Mansehra were considered since these are the known tourist destinations. The baseline number of 320 hotels in Swat was obtained from a recent USAID survey. For estimating the number of hotels in Abbotabad and Mansehra, per capita value of hotels in Swat was applied to the populations of the two districts. For the mining sector, only KP was considered and the baseline information provided by the provincial government was used. Based on these data sources and assumptions, the baseline numbers are presented in the following table:

Table Annex-15.1: Private Sector and Industries- Baseline Data

Province/Area	Industrial Units	Shops & Hotels	Mines
AJK	-	39,364	-
Balochistan	-	20,927	-
FATA	-	13,003	-
Gilgit-Baltistan	-	6,892	-
Khyber Pakhtunkhwa	1,146	230,656	1,131
Punjab	521	262,183	-
Sindh	244	207,987	-
Total	**1,911**	**781,011**	**1,131**

Floods Damage Overview

3. Damage estimation of the private sector was based on data sources from multiple sources. For damage to industrial and mining sectors, the data provided by the provincial governments was used. For shops and hotels, an assumption based approach was used. Data validation was done by visiting the flood affected districts and meeting with the private sector stakeholders to get first hand information.

4. In the industrial sector, most of the physical damage was to machinery and equipment; mostly to electrical components, such as motors and electrical panels. Buildings have been partially damaged. Stocks and inventories were also damaged to a lesser extent. Cotton ginning and rice processing were the two main sectors damaged in Sindh and Punjab. Since cotton and rice crops had not been harvested prior to floods, there were no stocks of these two commodities present in the processing units. However, one form of indirect damage was the informal credit which was provided by the ginning units to cotton growers. With the projected 25-30 percent reduction in cotton production of Southern Punjab, this informal credit has turned into a bad debt; thereby causing working capital issues. Along with the industrial sector, immense damage has been caused to buildings and stocks of small shops in Sindh and Punjab. In KP, along with damage to the industrial sector, the mining and tourism sectors have also been affected. The wholesale and retail trade sector has been badly affected, especially in district Nowshera where a number of large distribution setups and cloth traders exist. In Balochistan, FATA, GB and AJK, major loss has been incurred by the trading sector and buildings and stocks of small shops were damaged.

5. As a result of the disruption in regular economic activities, businesses are likely to incur production losses and suffer an increase in production costs. The drop in cotton production will have a direct economic impact on the ginneries. Meeting the cotton shortfall through imports at a higher price will erode the export competitiveness of Pakistani products. Associated sectors like oil expulsion and livestock feed will also be affected by raw material shortage and a subsequent price hike. Low consumer demand following the loss of income in the flood affected areas is also likely to adversely impact the private sector.

6. Suboptimal performance of the industry, trade and service sectors has led to a reduction in available employment opportunities. Closure of industrial units has a direct impact on the rural poor and waged laborers in the form of loss of livelihood. Even where an industry has not been affected directly, work-

ers are unable to resume their jobs since their houses have been damaged. According to estimates, more than five million workers have lost their jobs, both formal and informal, due to damage in the public and private sector. Rural labor has also lost its subsistence, through the loss of home gardens, backyard animals, and so on, with a greater impact on women. Furthermore, loss of these enterprises has resulted in loss of service to customers where alternate supply possibly does not exist. Details of damage extent in terms of number of enterprises are presented in the following table:

Table Annex-15.2: Private Sector and Industries- Damage (No. enterprises)

Province/Area	Industrial Units		Shops and Hotels		Mines	
	Completely Damaged	*Partially Damaged*	*Completely Damaged*	*Partially Damaged*	*Completely Damaged*	*Partially Damaged*
AJK	-	-	122	372	-	-
Balochistan	-	-	6,205	314	-	-
FATA	-	-	47	170	-	-
Gilgit-Baltistan	-	-	-	36	-	-
Khyber Pakhtunkhwa	-	89	9,837	7,865	17	219
Punjab	-	41	12,498	27,824	-	-
Sindh	-	16	51,569	2,714	-	-
Total	**-**	**146**	**80,277**	**39,295**	**17**	**219**

Damage Quantification

7. Two types of damage were estimated for each of these groups; direct damage, which included the losses due to physical damage to buildings, machinery and equipment and stocks; and indirect losses which were based on the estimated lost revenues. For industrial establishments, only those districts were considered for which the damage figures were officially received. For retail shops, a wider scope was used and all those districts were included where the housing sector was damaged. For mining and hotel sectors, the damage assessment was done only for KP.

8. For assessing the cost of direct damage in the industrial sector, the estimates provided by the provinces of KP and Punjab were used directly. For Sindh, damage estimates were calculated assuming that the industrial sector profile of the affected districts of Sindh is the same as those of the affected districts of Southern Punjab. Cotton ginning, rice processing, flour mills and sugar mills were the major damaged sectors in the affected districts. Average damage ratios and per enterprise damage cost of Southern Punjab were applied on the baseline numbers of the districts of Sindh to come up with the damage estimates.

9. For the shops sector, an assumption based approach was used since no official data was received. Break-up of the total calculated baseline number of shops into *'Pacca'* and *'Katcha'* shops was based on the housing data. Similarly, for calculating the extent of damage, the percentages of damage in the housing sector were applied to the shops, since the damage was assumed to be indiscriminate. Break-up of shops into completely damaged and partially damaged was also based on housing sector damage data. For calculating buildings' damage, an average area of 200 sq. ft. per shop and reconstruction costs of PKR 750 and PKR 450 per sq. ft. were used for *'Pacca'* and *'Katcha'* shops respectively. For completely damaged shops, a factor of 100 percent and for partially damaged shops, a factor of 40 percent

was applied. To account for depreciation, it was assumed that 25 percent of the shops were up to 5 years old, 50 percent were between 5-15 years and the rest more than 15 years old. Depreciation factors of 0.9, 0.7 and 0.5 were respectively applied to each of these three categories. For loss of stocks, it was assumed that '*Pacca*' and 'Katcha' shops had average values of stocks as PKR 70,000 and PKR 50,000 respectively. On a national scale, 119,487 shops were damaged; which were 15.3 percent of the total shops in the affected districts. Direct damage cost was calculated to be PKR 12,534 million (US$ 147 million).

10. Damage assessment for the hotel sector was based on assumptions. The local private sector provided the figure of 70 damaged hotels in Swat. The percentage damage figure stemming from this of 22 percent and those for the housing sector in three districts were used to derive the number of hotels damaged in Abbotabad and Mansehra. For calculating the damage cost, it was assumed that in Swat, 50 percent, and in the other two districts, 20 percent of hotels were completely damaged. Reconstruction cost was calculated using an average covered area of 5,000 sq. ft. and average cost of PKR 1,000 per sq. ft. Damage cost was estimated using the same depreciation factors as were used for the buildings of shops. For estimating the damage to other assets, average figures from a USAID survey were used. Estimates show that 85 hotels were damaged; with a direct damage cost of PKR 269 million (US$ 3 million). The damage cost of the mining sector in KP was based on the data provided by the provincial government. 236 mines were damaged with a direct damage cost of PKR 268 million (US$ 32 million).

11. To calculate indirect losses of the industrial sector, average values of production per enterprise in each sub-sector from the Census of Manufacturing 2005-06 were used. An average 20 percent loss in production value for a period of four months was assumed. For shops, an average monthly loss in sales revenue of PKR 10,000 was used; a total of six months loss for completely damaged shops and four months loss for partially damaged. For lost revenue of hotels, the average number of engaged rooms per month was assumed to be 90 (3 per day) at an average daily rate of PKR 3,000 per night stay; six months for completely damaged and four months for partially damaged hotels. For the mining sector, indirect losses were calculated using the figures provided by the Government for four months for partially damaged and six months for completely damaged mines. Total indirect losses of the private sector were calculated to be PKR 9,468 million (US$ 111 million). A summary of total damage to private sector is provided in the following table:

Table Annex-15.3: Private Sector and Industries- Summary of Total Damage to Private Sector

Province/Area	Direct Damage	Indirect Damage	Total Damage	
	PKR million		*PKR million*	*USD million*
AJK	44	10	**54**	**0.6**
Balochistan	716	167	**883**	**10.4**
FATA	18	6	**24**	**0.3**
Gilgit-Baltistan	2	1	**3**	**0.03**
Khyber Pakhtunkhwa	2,971	1,723	**4,693**	**55**
Punjab	3,551	2,977	**6,528**	**77**
Sindh	7,161	4,585	**11,747**	**138**
Total	**14,463**	**9,468**	**23,932**	**282**

Proposed Sectoral Recovery and Reconstruction Strategies

12. Any natural catastrophe puts the affected population into a state of dependency due to closure of businesses and loss of employment. Restoration of routine economic activities is the fastest way to take people out of this unwanted state and convert them back into independent and productive individuals.

Immediate Restoration of Businesses

13. The reconstruction strategy should include some immediate measures for facilitating quick restoration of affected business enterprises to reinstate lost employment opportunities. The other key requirement is ensuring availability of workers for resumption of these enterprises. Restoration of housing emerges as an important prerequisite for this, since the majority of workers of these industrial units lost their homes and are currently living in temporary shelters. Transitional housing is urgently required for the affected families so that people can rejoin their jobs. For the shops sector, reconstruction of damaged buildings and restocking of goods are the two most important needs. Support for reconstruction of damaged buildings and maintenance of equipment is also required for damaged hotels and mines so that they can resume operations. In any post-disaster situation, the construction sector experiences high growth to meet the reconstruction needs. Hence the sector should be supported by promoting use of local materials and labor in the construction activities carried out in the public sector.

Reconstruction Strategy/Recommendations

14. The measures for efficient recovery of the private sector in the affected districts should effectively gel with existing initiatives by governments in the affected areas. Implementation of the proposed strategy should be done through a public-private dialogue for which umbrella organizations could be formed at provincial level, with public and private sector representation. Such an arrangement will ensure that the proposed interventions are market driven, efficient and transparent. Some suggested measures follow:
    - Since the majority of affected businesses are small, it is important to support them through matching grants for reconstruction of buildings and restocking of goods. For small and medium industrial units, grants should be provided for maintenance of damaged machinery and equipment. An 'Enterprise Development Fund' may be created for implementing this grants program. Special consideration should be assigned to women and informal home-based workers under this program.
    - To facilitate businesses to resume their operations, they need to be supported by soft loans; these should be available to both men and women to meet loss to capital assets and working capital. Working capital loans should be made available to both industry and trade sectors; possibly as credit lines.
    - Provision for rescheduling of loans should be made part of the economic recovery strategy; preferably for all the industries in the affected districts, as the floods will have had an indirect impact on all the units in the area.
    - Arrangements should be made to facilitate repair and maintenance of damaged machinery and equipment. Pools of relevant skilled technicians should be created in the affected industrial clusters. Skilled workers from the safe districts should be provided incentives to go to the affected districts to carry out this activity at a fast pace. The costs should be shared by the Government.
    - Restoration of supply of electricity, water, gas and telephone is absolutely critical for smooth restart of the industrial units.
    - In the mining sector in KP and FATA, restoration of access by reconstructing damaged link roads should be ensured.
    - Preferential treatment should be given in government procurement processes to the products/services of business enterprises in the affected districts.
    - Government should negotiate to get concessions in duties to increase exports of Pakistani products into major international markets; especially for the value chains existing in the flood affected areas.

Long-Term Measures

15. Along with the measures for immediate relief and economic recovery, some steps should also be initiated to ensure the long-term sustainability of private sector development. Some suggested measures follow:
    - Business development services should be made available to affected business enterprises to create marketing linkages, facilitate access to improved technologies, new business startups, etc. Organizations like SMEDA could be asked to set up small satellite offices in the affected districts for the next one to two years to provide this support.
    - An important long-term recommendation is to carry out a complete mapping of the Pakistani business sector, covering, large, medium, small and micro-enterprises with data disaggregated by sex and other key indicators.
    - Reconstruction of damaged technical education and vocational training institutes should be done on a priority basis and their programs should be strengthened.
    - To prevent future losses to private sector enterprises from any natural disaster, an insurance culture should be promoted and insurance packages should be developed for different economic groups; with government sharing part of the insurance cost.

Needs Estimation of Recovery and Reconstruction

16. There are two scenarios for reconstruction of the private sector: the first one offering only facilitation support and the second complementing this facilitation support with cash subsidies.

17. The first option includes measures for immediate restoration of normal business activities and some measures for long-term sustainability. For restoration of damaged machinery and equipment, it is proposed to facilitate establishment of Repair Centers in the affected districts, by establishing infrastructure and providing technicians. Business Development Centers should be established by the Government to provide guidance to entrepreneurs. In the medium- to long-term, an 'Enterprise Development Fund' (EDF) should be established for SME development; specifically targeting affected businesses in all regions of Pakistan. Money from the proposed EDF should be used to support businesses to 'build-back better' by providing matching grants for market development, technological innovations, training and development, quality certifications, and so on.

18. The second option proposes providing direct support through cash subsidies to a select number of the affected businesses. It is suggested that 40 percent of affected shops be supported by providing cash to rebuild lost structures and restock goods. The program should ensure that there is equitable access, women's eligibility is assessed and marginal and vulnerable populations are not ignored. It is suggested that cash subsidies also be provided to the industrial sector since it can regenerate a large number of jobs in minimum time. Since most of the damaged industrial units are SMEs, it is proposed that this subsidy be provided to 70 percent of the damaged units (large units should not be eligible). Another proposed support to industrial units is a subsidy in electricity bills for four months; support should be higher in the initial months as an incentive to revive units quickly. Similarly, cash subsidies should also be available to affected hotels and mines. Based on the above assumptions, the reconstruction costs for the two options are provided in the following tables:

Table Annex-15.4: Private Sector and Industries- Reconstruction Costs

Province	Damage	Reconstruction Needs	
		Option-1	*Opetion-2*
	US$ million		
AJK	0.6	1.21	1.3
Baluchistan	10.4	5.1	6.6
FATA	0.3	1.11	1.1
Gilgit-Baltistan	0.03	1.04	1.0
Khyber Pakhtunkhwa	55.2	20.9	26.3
Punjab	76.8	26.9	34.2
Sindh	138.2	45.3	58.0
Total	**282**	**102**	**129**

Table Annex-15.5: Private Sector and Industries- Prioritized Recovery Framework/Timeframe (Option-2)

Activity	Short-term (12 months)	Medium- and Long-term
Direct Cash Subsidies for reconstruction	2,296	-
Facilitation for restoration of businesses	190	-
Enterprise Development Fund	-	7,000
PPP Fund	-	1,445
Total (PKR million)	**2,486**	**8,445**
Total (US$ million)	**29**	**99**

ANNEX-16: FINANCIAL SECTOR

Background

1. The impact of the floods on the financial sector has been assessed primarily through the impact on the banking sector, the microfinance sector, and the NBFI sector with particular focus on the insurance sector. This section presents estimates, where possible, of the quantifiable damage for infrastructure losses suffered by the sector as well as the anticipated increase in non-performing loans (NPLs). In the case of banks and MFIs, an effort has been made to estimate the amount of credit required for the revival of business in these sectors.

2. The banking sector in Pakistan as of June 30, 2010 consisted of forty institutions, including twenty-five local private commercial banks, seven foreign banks, four public sector and four specialized banks. As of June 30, 2010 they are 9,673 branches around the country, CAR was at 13.9 percent and the NPLs stood at PKR 459 billion with the largest exposure to the corporate sector.

3. There are currently seven microfinance banks, nine MFIs, four rural support programs and thirty-one other organizations that provide microfinance services in the country. The five largest microfinance providers in terms of market share of active borrowers include National Rural Support Program (NRSP) (22.3 percent), Kushali Bank (19.7 percent), Kashf (16.45 percent), First Microfinance Bank (FMFB) (11.4 percent) and Tameer (4.8 percent). However, the microfinance sector in Pakistan has in general lagged behind other countries in the region such as Bangladesh and India. It has been estimated that over 18-20 million households in the country could be potential MF clients, while the current outreach for microfinance providers is only around 1.8 million, i.e. market coverage is hardly 8-10 percent of the potential market.

4. The predominant constituents of the NBFI sector consist of Asset Management Companies, Investment Advisories, Leasing Companies and Investment Banks which account for more than 80 percent of the sector. As of June 30, 2009 there existed fifty-nine registered NBFCs carrying out various licensed activities. NBFIs have had to face a severe operating environment due to the fallout from the economic slowdown and regulatory structural weaknesses in 2009. The twelve leasing companies in operation within the sector have a classified portfolio of 15 percent of gross assets as of December 31, 2009. Orix leasing dominates the market in the leasing segment.

5. The insurance industry in Pakistan is very small compared to its peers in the region. Pakistan has one of the lowest insurance penetration and density rates in the world. As of December 2008, the industry's total premium revenue stood at over US$ 955 million.

Floods Damage Overview for the Sector

6. About ninety bank branches located in the affected areas were damaged, either completely or partially, representing an infrastructure loss of PKR 69.7 million. Higher losses were recorded in the private domestic banks followed by the public sector banks. In addition, about ten ATMs were reported destroyed representing more than PKR 6.1 million in damage. The total amount of damage from infrastructure loss in the banking sector has been estimated at PKR 75.9 million (US$ 0.9 million).

Table Annex-16.1: Financial Sector- Physical Damage Details

Name of Bank	Total Number of Damaged Branches	Total Number of Damaged ATMs	Estimated Amount of Damage (Branches)	Estimated Amount of Damage (ATMs)	Total Amount of Damage (PKR)
National Bank of Pakistan *	31	0	30,000,000	-	30,000,000
The Bank of Khyber	1	1	4,400,000	940,000	5,340,000
The Bank of Punjab	3	0	4,375,000	-	4,375,000
Allied Bank Limited	5	2	9,700,000	1,190,000	10,890,000
Askari Bank Limited	1	1	3,760,732	850,000	4,610,732
Habib Bank Limited	12	1	3,521,000	1,000,000	4,521,000
MCB Bank Limited	23	3	4,755,000	900,000	5,655,000
NIB Bank Limited	1	0	2,300,000	-	2,300,000
United Bank Limited	7	1	2,270,000	500,000	2,770,000
Zarai Taraqiati Bank Limited	5	0	1,000,000	-	1,000,000
Meezan Bank Limited	1	1	3,700,000	800,000	4,500,000
Total:	**90**	**10**	**69,781,732**	**6,180,000**	**75,961,732**

**NBP has reported that out of their 31 affected branches, 04 have been completely destroyed and remaining are partially damaged.*

7. In the microfinance sector, a total of 86 out of the 625 branches located in the affected areas were partially or completely damaged. Of these the majority, more than 70 percent, are located in Sindh. These figures also include five MFB branches that were affected. The quantified damage amounts to PKR 34 million (US$ 0.4 million)

Damage Quantification

8. The greater quantitative damage within the financial sector has been suffered by banks, both in terms of infrastructure damage as well as lending portfolio through an increase in their NPLs as a result of damage in agriculture, MSMEs and housing.

Table Annex-16.2: Financial Sector- Damage and Loss Figures

Sectors	Physical Damage PKR million		Loan Losses PKR million		Total PKR million
	Public Sector	*Private Sector*	*Public Sector*	*Private Sector*	
Banks	41	35	37,252	15,109	52,439
MF Sector (MFI & MFBs)		34		2,156	2,190
Leasing				1,333	1,333
Insurance				1,289	1,289
Total	**41**	**69**	**37,252**	**19,889**	**57,251**

9. Physical damage amounts to PKR 110 million (US$ 1.3 million) and loan losses are over PKR 57 billion (about US$ 674 million) for the sector.

10. The NPLs in the banking sector have been estimated to have increased from PKR 24.6 billion (US$ 290 million) to PKR 52 billion (US$ 616 million). The NPLs in the agriculture sector represent 55 percent of the total NPLs, having registered an increase of over 340 percent over their pre-flood levels. The largest quantitative increase has been in the province of Punjab which also represents 48 percent of total NPLs. This is followed by Sindh which estimates an increase of more than 170 percent in their affected portfolio and represents 28 percent of total NPLs. The affected portfolio within agriculture represents 56 percent of the total outstanding loans in that sector followed by housing with a ratio of 53 percent and SMEs with a ratio of 29 percent to total outstanding loans. Overall NPLs account for 36 percent of total outstanding loans in the affected areas.

11. Within the microfinance sector, total NPLs in the affected areas have been estimated to have increased from PKR 304 million (US$ 3.6 million) to PKR 2,156 million (US$ 25.3 million). NPLs in the MFIs represent just over 40 percent of the total NPLs with the larger share coming from the MFBs. Within the MFIs, the largest quantitative increase has been felt in Sindh (representing 56 percent of total NPLs) followed by Punjab (with 38 percent). The agriculture sector has been by far the worst affected representing 69 percent of total NPLs for both MFIs and MFBs combined.

12. There is little information forthcoming on the losses within the NBFI sector. Given their limited presence in the affected areas, no damage was reported to physical infrastructure, except within the leasing sector. Expected defaults within this sector amount to PKR 1,333 million (US$ 15.7 million) with only three leasing companies, one investment bank and one Modaraba affected, across the thirty-two flood affected districts.

13. Preliminary impact on the insurance sector has been limited due to the low insurance penetration and density in the affected areas and in the crop and livestock in particular. Most of the flood affected areas are in the rural belts of the country where insurance penetration is almost non-existent. The impact of this disaster on the insurance industry might not be very visible at the moment but it could affect the industry's growth rate and premium over time. The total number of claims estimated in the affected areas is just over 400 with a total estimated loss amount of PKR 1.28 billion (US$ 15 million). A higher impact was felt in fire, marine and motor insurance classes as opposed to crop and livestock insur-

ance. However, a secondary impact is anticipated in related industries. For example these estimates do not take into account the PKR 2.5 billion expected to be recovered through insurance from the loan losses in the banking sector. The secondary impact is also expected through users of crops and raw materials affected, e.g. the textiles sector has a higher insurance density and will be affected by the damage to the cotton crop.

Proposed Sectoral Recovery and Reconstruction Strategies

14. There is ample global evidence that blanket write-offs of NPLs should not be done and write-offs, if any, should only be done on a case-by-case basis after detailed borrower level assessments and their ability to pay. Broad recommendations for the banking sector include: (i) establishing incentive mechanisms to extend fresh credit in the affected areas for revival of business activities particularly for agriculture and MSMEs. This will require concerted efforts and flexible and new products to expand outreach to cater to emerging needs. For this a **Partial Credit Guarantee/ Risk Sharing Facility** could be structured with a funded first loss in the range 10 - 20 percent, with commercial banks sharing credit risk of at least 50 percent of the remaining portfolio. Such a facility could have a substantial impact given the leveraging which can be up to ten times the funded facility; (ii) Moratorium on existing loans/**rescheduling with interest rate subsidy.** However clearly defined eligibility would have to be worked out to target the subsidy where it is intended and must be time-bound - two years appears to be a reasonable period for businesses to recuperate and implementation to be strictly monitored; and (iii) **Refinancing line** for liquidity support for agriculture and MSMEs as well as to support reconstruction of housing units. The exact terms will need to be decided depending on the availability of funding and the amount of subsidy needed to be provided for extension of new credit. In addition, certain exemptions are being considered in provisioning requirements and FSV by the Central Bank.

15. In the case of the Microfinance Institutions, while no blanket write-offs are recommended for the sector, some write-off may be unavoidable due to the loss of livelihoods of the clients and the impact on their capacity to pay. Proposed interventions in the microfinance sectors could include a **Risk Mitigation/ Capital Protection Fund** which in the case of MFIs would also provide them the liquidity needed for fresh credit requirements, moratorium on old loans/rescheduling of repayment period, new capital recovery loans as well as rescheduling of loans with creditors including PPAF. Overall, the situation also presents the Government with a good opportunity to focus on financial inclusion and increasing outreach and coverage of the potential market.

16. Another area of focus for the financial sector should be in housing reconstruction. This would be the ideal time to tackle an issue which has long beset the country. The mismanagement of land records and title deeds has resulted in numerous problems for the housing sector. The housing finance market as a result has been limited and its potential for contributing to economic growth underutilized. Compiling comprehensive electronic land records and clean titles should be a priority in the reconstruction phase.

Needs Estimation of Recovery and Reconstruction Needs

17. The banks have estimated a requirement of **PKR 36 billion (US$ 423 million)** for revival of agriculture and other businesses including housing finance in the affected districts. About 75 percent of these fresh credit requirements are for the public sector commercial and specialized banks. Most of the banks in the country are considered to be well capitalized and are hence able to withstand the increased strain caused by the direct and indirect impact of the floods. While their NPLs in the affected areas have more than doubled, these are still not that significant as a proportion of their overall portfolio of outstanding loans.

Table Annex-16.3: Financial Sector- Needs Assessment of Recovery of Business

Sectors	Physical Damage		Loan Losses (PKR Million)		Recovery Est. (PKR Million)	
	Public	*Private*	*Public*	*Private*	*Public*	*Private*
Banks	41	35	37,252	15,109	27,962	8,044
MF Sector (MFIs & MFBs)	-	34	-	2,156	-	3,352
Leasing	-	-	-	1,333	-	-
Insurance	-	-	-	1,289	-	-
Total	**41**	**69**	**37,252**	**19,889**	**27,962**	**11,396**

Sources: State Bank of Pakistan, Pakistan Microfinance Network and Securities and Exchange Commission of Pakistan

18. The microfinance sector requires **PKR 3.35 billion (US$ 39 million)** for revival of businesses in the affected areas of which PKR 1.5 billion is for the MFBs. Combined recovery estimates for the financial sector amount to **PKR 39 billion (US$ 463 million)**.

Table Annex-16.4: Financial Sector- Prioritized Sector Recovery Framework/Timeframe

Activity	Short-term - 12 months (PKR million)	Medium- and Long-term (PKR million)
Partial Credit Guarantee Facility	3,400	1,700
Rescheduling with Interest Rate Subsidy	1,500	2,000
Refinancing Line for liquidity support	10,000	18,500
Risk Mitigation Fund for MFIs	1,000	1,200
Total (PKR million)	**15,900**	**23,400**
Total (US$ million)	**187**	**275**

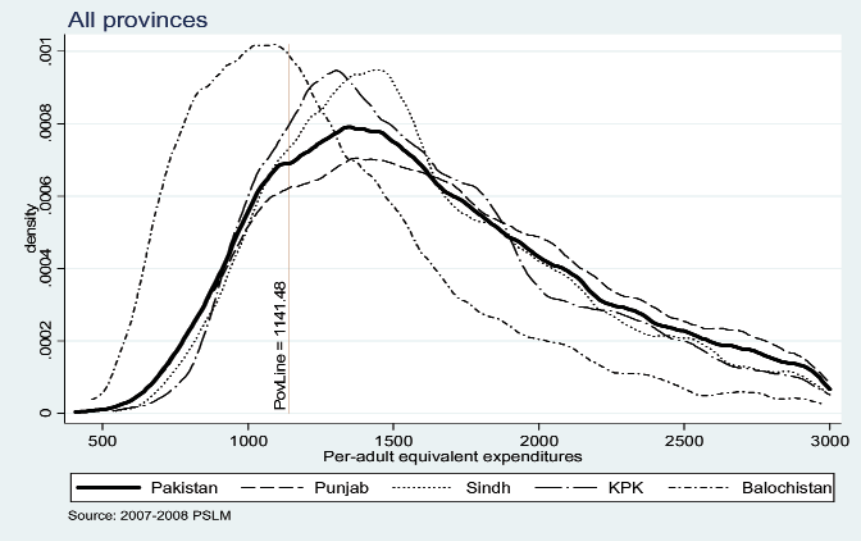
ANNEX-17: SOCIAL PROTECTION AND LIVELIHOODS

Gerhard Juran

Background

1. The Livelihoods and Social Protection chapter summarizes the pre-flood poverty situation, and provides an estimate of the severely affected population that requires post-flood assistance. Pre-flood poverty data from the 2007/2008 PSLM survey indicates that poverty in Balochistan is significantly higher than the Pakistan average and poverty levels in other provinces (Figure 17.1). Province level aggregation conceals significant variation in pre-flood district poverty rates, however. For instance, in Punjab, pre-flood district-level poverty rates range from 4.4 percent to 27 percent. As for variation in poverty between flood and non-flood districts, in Balochistan flooded districts were on average less poor than the other districts in the province, while in Punjab and Sindh, flooded districts were poorer than the provincial averages (all districts of KP are flood affected) as of 2007/08.

Figure Annex 17.1: Distribution of per-adult equivalent expenditures, PSLM 2007-2008



2. A more detailed analysis reveals that a significant percentage of the population is concentrated around the poverty line in both flood-affected and non-flood affected areas (consistent with the overall trends captured by Figure 1 above). As a result, due to an external shock (i) the already poor population just below the poverty line are likely to fall deeper into poverty, making it more difficult to help them recover, reducing the impact of anti-poverty measures, and risking an expansion of the number of chronically poor who will become permanently dependent on public and private transfers; while (ii) the ones just above the poverty line - the so-called vulnerable population[143] - are likely to fall below the poverty line, increasing the total number of poor in need of assistance, albeit sometimes only on a temporary basis. In policy terms, this will require the development of new measures as well as strengthening existing ones with the aim of helping the poor cope with poverty, mitigation of the effects of shocks on the poor and vulnerable, and the facilitation of movement out of poverty.[144]

3. Food insecurity is also a major issue in Pakistan, with almost half of the population (48.6 percent) not having enough access to sufficient food to lead active and healthy lives.[145] As can be expected, there is a close correspondence between the poor and vulnerable households in immediate need of assistance

[143] Vulnerable population is defined as the population immediately above the poverty line. Other definitions of vulnerability covering sub-populations such as female headed households, children, disabled etc. are already considered by the poverty targeting instruments that are being currently used by the GoP.
[144] Mitigating activities reduce the effects of a future risk or shock. Coping strategies help the population deal with the after-effects of the shock
[145] Food Insecurity in Pakistan 2009, Report by the World Food Program, Swiss Agency for Development Cooperation, and Sustainable Development & Policy Institute.

and households that were already food insecure before the floods, especially in Balochistan and KPK Provinces.

Floods Damage Overview for the Sector[146]

Estimation of Severely Affected Population that Require Assistance and Employment Losses

4. The affected populations are drawn from the government's latest estimates, at the district level, and the number of affected households is obtained by dividing the number of affected people by average household size at the province level. The methodology for identifying the severely affected population (target group) is as follows. All households with damaged or destroyed kachas (mud houses) are considered severely affected. Then provincial post-flood poverty rate has been estimated and applied to the remaining affected households to arrive at the total number of severely affected households.

5. The post-flood poverty rates are projected using PSLM 2008/09 data and the flood damage data. PSLM 2008/09 is the latest available household survey data in Pakistan, has around 75,000 households, and is representative at the district level. However, it does not have consumption data; so the household consumption data is imputed using the consumption model developed in PSLM 2007/08 data. The post-flood poverty rates are projected by applying some damage scenarios (which will be discussed next) into the predicted expenditure for all households in PSLM 2008/09.

Damage Scenarios

6. Given that data on specific areas damaged within districts was not available at the time of this assessment, all the households in flood-affected districts are assumed to be uniformly affected in a proportion equal to the share of damaged agricultural land in their districts. However, who were affected by this damage to agricultural lands and how much they lost can differ among their income sources. Although there are many ways of separating income groups, the following three groups, not necessarily mutually exclusive, are taken into account in the projection: (i) households owning agricultural land; (ii) households owning no agricultural land; and (iii) households with agricultural wage workers.

7. For the first category, two specifications were considered, namely that in the affected districts, all the households owning land diminish their (1) consumption from own production or (2) aggregate consumption in proportion to the share of agricultural damage in their respective districts. For the landless households, the following two specifications were attempted. The first specification assumes that only randomly selected households lose their consumption from own production in proportion to the share of agricultural damage in their respective districts, in order to capture the fact that not all of the landless households will consume from own production. The second specification assumes that all landless households lose their consumption from own production in proportion to the share of agricultural damage in their respective districts. For the final group, the households with members working in agriculture, both specifications are identical. They assume that eighty percent of their income from wages is used for household consumption/expenditures, and therefore this amount will be lost in proportion to the share of agricultural damage in their respective districts. The following table summarizes the above specifications.

[146] The information underlying the analysis is based on the DNA team's analysis of 2007/08 and 2008/09 PSLM data sets; damage data provided by the Pakistan National Disaster Management Authority (NDMA); ILO estimates on basis of the Pakistan Labour Force survey 2007-2008; as well as WFP's Food Impact Assessment and Analysis of Food Insecurity in Pakistan; and some field visits.

Summary of specifications of projections: Who will lose and what will be subject to flood damage		
	Specification 1	**Specification 2**
households owning agricultural land	• All • only own consumption	• All • the whole household expenditure
households owning no agricultural land	• Randomly selected landless households • only own consumption	• All • only own consumption
Households with agricultural wage workers	• All • 80 percent of agricultural wage income	
Note: The affected population defined above will lose part of consumption at the same rate as the district average share of damaged lands.		

8. Table 1 provides evidence on the robustness of the findings, with respect to the assumptions made on the impact of agricultural land damage on household consumption. Results from both sets of specifications suggest that around 1.9 million households are severely affected and thus they are in need of immediate assistance.

9. As for employment losses, the total number of workers affected by the floods is estimated at 4.5 million. This corresponds to approximately 8.9 percent of all workers in Pakistan. Based on the characteristics of the employed preceding the floods, it is also estimated that 1.1 million female workers have been affected, or almost 23 per cent of all workers affected by the floods.[147]

10. Overall, more than two thirds of the workers affected by the floods were employed in agriculture, and the same is true for more than 90 per cent of the female workers affected. The very high proportion of agricultural workers affected results to an important extent from the fact that the floods primarily affected rural areas. Furthermore, the province with the largest number of workers affected, Sindh, is also the province with the highest proportion of workers in agriculture. In rural areas in Sindh preceding the floods, 70 percent of employed men and 97 percent of employed women were active in agriculture.

[147] The estimates are based on a number of conservative assumptions, therefore they should be taken as a lower-bound for the employment impact.

Table Annex-17.1: Social Protection and Livelihoods - Estimates of Severely Affected Poor House-Holds in the Flood Affected Areas

Province/Region	Total Affected Population	Total HH Affected	Severely Affected HH		% Severely Affected HH	
			Specification 1	Specification 2	Specification 1	Specification 2
AJK	801,905	123,370	38,727	43,621	31%	35%
Balochistan	902,639	132,741	102,868	102,259	77%	77%
FATA	243,546	26,188	11,463	12,314	44%	47%
Gilgit–Baltistan	168,676	25,950	9,790	10,724	38%	41%
Khyber Pakhtunkhwa	2,880,339	360,042	278,410	283,131	77%	79%
Punjab	7,329,358	1,110,509	557,793	607,836	50%	55%
Sindh	6,749,915	1,124,986	863,609	865,840	77%	77%
Total	**19,076,377**	**2,903,786**	**1,862,659**	**1,925,726**	**64%**	**66%**

Note: The cost calculations for Punjab, Sindh, KP and Balochistan are based on stronger assumptions than for the other three in the Table, due to lack of representative household survey data for FATA, GB and AJK.

Proposed Sectoral Recovery and Reconstruction Strategies

11. In the context of disaster management, social protection strategies should help the affected populations, and in particular poor and very poor households, cope with the immediate after-effects of the disaster (in this particular case, the 2010 floods); and in the medium- to longer-term[148] build systems that mitigate the effects of future shocks.[149] It is particularly important to try to limit family and community risk-taking through informal arrangements (negative coping strategies) that are likely exhaust their asset base and have damaging social and economic consequences, especially in terms of human development. Counterproductive strategies with lifecycle effects can be particularly damaging: eating less, women eating less than men, reducing spending on health care, withdrawing children from school, and so on.[150]

12. The actual formal social protection strategies that are applied for disasters or emergencies may be similar to those that address chronic poverty and structural unemployment. They would be designed in a way that recognizes that, although the problems are similar - poverty and unemployment, the cause and duration of the contingency may be different. As a result, social protection programs that focus on immediate relief from the effects of the disaster may assign higher weight to redistributive goals as opposed to programs that address chronic poverty and unemployment, and focus on lifecycle contingencies.

13. The key entry points indicated below may include new programs or dovetail into existing ones. They are as follows:

[148] The "immediate" future, or the short term, implies a six to eight month period following the introduction of short-term initiatives; the medium-to longer term cover a roughly 30 month period
[149] Mitigating activities reduce the effects of a future risk or shock. Coping strategies help the population deal with the after-effects of the shock
[150] MCRAM assessment

- ***Temporary employment replacement relief in cash or in kind*** (essentially food) to affected poor households; cash where there are markets and distribution systems function; otherwise food, or a combination of cash and food, should be considered. Following an initial period of six months, during which beneficiary households would receive a monthly cash payment of PKR 5,000[151], eligible beneficiaries would be integrated into the BISP cash benefit system, receiving PKR 1,000 per month for as long as they remain eligible. Other poor households would have access to other, either new or ongoing, safety net programs as necessary. Some could re-enter the labor market without further recourse to safety nets.
- ***Creation of temporary employment*** opportunities through:
  i. Government-initiated public works schemes that would primarily focus on rehabilitating and rebuilding large public infrastructure in the disaster area;
  ii. Community-generated small social and economic infrastructure projects that build up community assets. Here, the focus would be on restoring infrastructure and resources that have a direct impact on livelihoods in the community and that can have a direct effect on mitigating risks from future natural disasters.
- ***Enhancing disaster recovery preparedness***, including building institutions in high risk areas. This would involve coordinating federal and provincial safety net mechanisms to mitigate effects of future disasters and cope with immediate post-disaster effects. Pre-crisis planning is critical: it should ensure availability of timely and reliable information on poor and vulnerable groups to allow for the design of appropriate interventions. But relying solely on static pre-crisis assessments of poverty is insufficient; it might fail to capture the dynamics of poverty during the crisis and might omit important segments of society in need of assistance. This suggests that a system of on-going data collection should be in place.
- ***Rebuilding livelihoods.*** Beyond the above directly disaster-related entry points, assistance will be needed with the rebuilding of livelihoods. While such programs may have broad coverage, it could be warranted to place special emphasis for some time on disaster areas, where the need for and challenges to restoring livelihoods may have become exceptional. Interventions may include asset building that draws on available community resources as a catalyst for productive enterprise; skills development that focuses on raising productivity in everyday livelihood activities, with a particular focus on women's work; and micro-operations, including credit, insurance and savings instruments.
- In addition, women and youth have traditionally found it especially difficult to find decent employment opportunities and to secure a life outside of poverty. Without livelihood support, poverty among these groups will grow, leaving thousands more young people and women in the poverty trap. Therefore special interventions that are in sync with local conditions and responsive to the needs of these groups will be required to serve as means for sustainable livelihoods.
- Likewise, ***introduction of a conditional cash transfer (CCT) scheme*** may serve as a springboard for restoring use of health services and school attendance. While the CCTs address life-cycle contingencies rather than the effects of crisis, they can in the current situation play an important role as a catalyst for encouraging resumption of school attendance and use of health services through co-responsibility arrangements.
- Adopting a ***common targeting instrument*** for data consistency and use in times of emergency - BISP offers a good platform to link safety net initiatives. However, as noted above, it is important that a dynamic approach is taken to the data platform. There should be increased focus on the collection of disaggregated data on the vulnerable population sub-groups to regularly update information and assess progress in meeting social goals. In addition, information on programs' outreach, management costs and impact should be routinely collected for management and policy-making.

[151] The estimated value of a monthly food basket as defined by WFP.

Needs Estimation for Recovery and Reconstruction Strategies

14. The cost of the temporary employment replacement relief program has been estimated and is indicated in Table 2 below. It is expected to cover around 1.9 million severely affected households over a period of 6 months at a benefit level of Rs 5000 per month (the value of a monthly food basket as defined by the WFP). The total cost for a temporary cash benefit for the first six months would be somewhere between Rs 56 to 58 billion, corresponding to USD 654 to 683 million respectively.

Table Annex-17.2: Social Protection and Livelihoods - Estimates for Cash Grants to the Severely Affected Households

	Specification 1			Specification 2		
Province/Region	**Severely Affected HH**	**Cash Grants PKR 5,000/mth for 6 months (PKR million)**	**Cash Grants US$ million**	**Severely Affected HH**	**Cash Grants PKR 5,000/mth for 6 months (PKR million)**	**Cash Grants US$ million**
AJK	38,727	1,161.8	13.6	43,621	1,344.50	15.8
Balochistan	102,868	3,086.0	36.1	102,259	3,087.70	36.3
FATA	11,463	343.9	4	12,314	375.7	4.4
Gilgit – Baltistan	9,790	293.7	3.4	10,724	328.6	3.9
Khyber Pakhtunkhwa	278,410	8,352.3	97.7	283,131	8,528.50	100.3
Punjab	557,793	16,733.8	195.7	607,836	18,324.70	215.6
Sindh	863,609	25,908.3	303	865,840	26,086.70	306.9
Total	**1,862,660**	**55,880**	**654**	**1,925,725**	**58,076**	**683**

15. Other areas of sector recovery and reconstruction have not been costed, as temporary employment replacement is the only option recommended for all households severely affected by the floods. Other livelihood rehabilitation interventions can be designed for selected groups.

ANNEX -18: DESCRIPTION OF 2010 FLOODS

Philip Wood

Introduction

1. Pakistan experienced extraordinary rainfall in mid-July 2010, which continued until September 2010. The result was unprecedented floods affecting the entire length of the country. The floods have been assessed to be the worst since 1929. The National Disaster Management Authority (NDMA) has estimated that the floods affected 78 districts and covered over 100,000 square km. The floods have affected more than 20 million people, (more than one-tenth of Pakistan's population) with over 1,980 reported deaths and nearly 2,946 injured.[152] About 1.6 million[153] homes have been destroyed, and thousands of acres of crops and agricultural lands have been damaged with major soil erosion happening in some areas. With such a catastrophic flood event, the question is raised whether the reconstruction strategy should consider "building-back-better" or "building-back-safer" in view of flood risks. This section attempts to address this question based on an analysis of the 2010 flood events.

2. Floods are a regular phenomenon in the country. Since its creation, Pakistan has faced eight severe floods. These floods have resulted in more than 8,000 deaths, affected more than 100,000 villages and towns, and eroded some 285,000 ha of land. The most recent major floods happened in 1988 and 2002. The cumulative financial loss of these floods is estimated at about PKR 765 billion.[154]

3. Embankments and river training works have been constructed to protect urban and rural areas along many rivers in the country. This flood protection infrastructure is to provide protection against a "design" flood with a certain probability of occurrence (referred to as "return" period). Therefore, flooding is likely to happen when a flood event exceeds the design flood. The embankments along most reaches of the Indus River between Kalabagh and Guddu and along its tributary rivers provide protection for a flood with a 50-year return (a "50 year" flood).[155] The embankments along the Indus River downstream of Guddu Barrage provide protection for a 50-year or 100-year flood depending on the vulnerability of the areas being protected. The level of protection along some reaches in Sindh is higher because of the risk that large areas will be inundated and the difficulties in draining off the flood waters because of the topography in case of an embankment failure.

The 2010 Flood Event

4. The high intensity rainfall in KP province generated unprecedented flood peaks in the Swat River.[156] These floods severely damaged the Amandara Headworks and washed away the Munda Headworks, both major irrigation structures.[157] The combined flow of the Swat and Kabul rivers generated another unprecedented flood peak at Nowshera town, causing severe damage. In the Indus River, the Tarbela reservoir reduced an historic high peak discharge by some 28 percent. The floods traveled downstream through the barrages in Punjab and Sindh until they reached the Arabian Sea downstream of Kotri Barrage. Extreme high floods were recorded at the Chasma and Taunsa Barrages in Punjab. The floods in the Kurram River and western hill torrents contributed to this. A near historic flood peak was also recorded at the Kotri Barrage. The comparison of the 2010 flood peaks with historical flood peaks recorded in the Indus River is shown in Table 1.

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[152] NDMA Situation Report October 26, 2010.
[153] World Bank/ADB DNA validated numbers
[154] Federal Flood Commission, Flood Protection Plan 2006 and Pakistan Journal of Life and Social Science, Poverty in Riverine Areas: Vulnerability, Social Gaps and Flood Damages, 2008, 6(1).
[155] For river training works associated with the barrages, the level is determined based on the highest observed flood level plus a freeboard allowance.
[156] The one-day rainfall recorded in KP on 29 July varied from 21 to 280 mm; on 30 July, 274 mm of rain was recorded in Peshawar.
[157] A flood peak of 270,000 ft^3sec^{-1} was recorded at Amandara and 300,000 ft^3sec^{-1} at Munda Headworks.

Table Annex-18.1. Historical and 2010 flood peaks at Barrages on Kabul and Indus Rivers

Locations	Design Discharge (ft3sec-1)	100-yr Flood (ft3sec-1)	2010 Flood		Historic Peak	
			Peak	Return Period		
			(ft^3sec^{-1})	Years	Year	(ft^3sec^{-1})
Tarbela Inflows	1,500,000	653,000	835,000	3461	1929	682,159
Tarbela Outflow			604,000	-		
Kabul at Nowshera		218,000	480,000	>10,000	1965	218,000
Kalabagh	950,000	1,091,000	937,453	45	1942	917,015
Chashma Barrage	950,000	934,000	1,036,673	250	1942	811,798
Taunsa Barrage	1,100,000	911,000	959,999	211	1958	788,650
Guddu Barrage	1,200,000	1,332,000	1,148,738	40	1976	1,176,150
Sukkur Barrage*	900,000	1,290,000	1,132,180	39	1976	1,161,472
Kotri Barrage	875,000	962,000	964,897	101	1956	981,000

**original design capacity of Sukkur Barrage was 1.5 million* ft^3sec^{-1}

Source: *Federal Flood Commission*

5. Of the five barrages on the Indus River, the flood peaks were close to or slightly above the design capacity of three barrages (see Table 1). The capacity of Sukkur Barrage is lower than the design capacity due to problems with a number of its gates. As a result, the peak flood was higher than the actual capacity but the flood passed through without having to breach an upstream guide bund to safeguard the structure. The flood peak at the Kotri Barrage was higher than its design capacity but the flood also passed through the structure.

6. Breaches occurred upstream of the Jinnah and Taunsa Barrages[158] causing widespread flooding in the Dera Ismail Khan and Muzaffargarh districts. In Sindh, three breaches occurred: at the Tori Bund, upstream of the Guddu Barrage and at MS and Sanjrani Bunds downstream of the Kotri Barrage. Of these five breaches, the breaches in Kalabagh and Taunsa occurred when the flood peak significantly exceeded the design flood while the two breaches downstream of the Kotri Barrage occurred while the flood was at the design flood. However, it is reported that none of the embankments overtopped. The breach in the Tori Bund occurred while the flood in the Indus River in that reach was below the design flood. The factors that contributed to and caused the breaches are being investigated.

Reconstruction Strategy - For the protected Lower Indus plains

7. The system of embankments protects the infrastructure located in the Lower Indus plain area against floods. With the provison that the river embankments are structurally well-designed, well-built and adequately maintained, there is no ground for adopting a "building-back-better" reconstruction strategy for the infrastructure damaged as a result of the 2010 floods. However, as part of the proposed review of the country's flood management strategy, strengthening of embankments for certain river reaches and second-line flood protection embankments (especially in Sindh) may need to be considered.

8. Within the flood plains (kacha areas) permanent public sector infrastructure development is to be discouraged in view of the inherent high flood risk.[159] Settlements in the flood plains are equally at risk

[158] Jinnah Barrage is located between Kalabagh and the Chashma Barrage.

[159] Besides the flood risk, there is also the risk of loss of land due to shifts in the river course within the river plains.

but their inhabitants have time to prepare for evacuation and temporary relocation because of the travel time of the Indus floods.[160] While building permanent settlements in the flood plains should be discouraged, forced relocation is not appropriate as the mostly poor inhabitants depend on livelihood activities derived from the river and the fertile kacha lands. Certain flood proofing measures could be considered for the settlements, especially for those far away from the embankments. These could include, among others, establishing earth mounds or elevated platforms to be used as refuge areas during floods; essential community and public facilities could be built on top of these structures.[161] The system of providing early flood warnings and flood preparedness at community level to the communities at risk may need to be improved.[162] The Government needs to clarify its policy towards compensation in case of a flood event for those who opt to use the flood plains for settlement and productive use despite the inherent risks. The insurance industry should also consider the flood risk associated with assets located within the flood plains.

Reconstruction Strategy - For the Upper Indus mountainous areas

9. Destructive flash flooding of an unprecedented nature occurred in the Swat River far exceeding a 100-year flood event. Providing protection against future floods of a magnitude similar to the 2010 flood event is not justified on account of cost and equity considerations.[163] The current flood-related design criteria could therefore be maintained for small-scale local public infrastructure. However, "building-back-better" may need to be considered for public buildings such as schools, health units and offices. This could include relocating such buildings away from the high risk riverine areas to locations with a lower risk, or protecting and raising the buildings' ground level. Mapping high risk areas along rivers such as the Swat River based on the 2010 flood event and earlier major flood events will be required. Flood routing analyses could assist in determining the high risk areas provided sufficient hydro-meteorological and topographical information is available. Rebuilding of houses in such areas should be discouraged and local governments should refrain from issuing building permits for sites within these areas. As in the case of flood plains in the Lower Indus plain area, the insurance industry needs to take into account the flood risk of assets located within the high risk areas.

10. To rebuild certain strategic infrastructure in KP, AJK, GB and FATA, such as bridges on provincial highways, the flood related design criteria may need to be reviewed for building-back-safer. Flood-proofing measures could be considered such as raising bridge decks, replacing multi-span bridges by single-span bridges and providing overflow sections in elevated approach roads.

[160] It took the flood peak 3 days to travel from Nowshera to the Taunsa Barrage, 9 days before it reached Guddu Barrage and 28 days before it reached the Kotri Barrage.
[161] Care should be taken to ensure that such measures do not significantly obstruct the flood flows.
[162] The Pakistan Meteorological Department operates the country's Flood Early Warning System.
[163] It may not be appropriate to provide a significantly higher level of protection for valleys such as the Swat valley than for other parts in Pakistan. However, given the fact that flood flows in such areas are more destructive, a higher level of protection for settlements and critical infrastructure may need to be considered.