

**Pakistan
2005 Earthquake**

Preliminary Damage and Needs Assessment

**Prepared By
Asian Development Bank
and
World Bank**

**Islamabad, Pakistan
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CURRENCY AND EQUIVALENTS

Currency Unit = Pakistan Rupee
US\$1 = PKR 59.4

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank	LPG	Liquefied Petroleum Gas
ADP	Annual Development Plans	MOH	Ministry of Health
AIDS	Acquired Immune Deficiency Syndrome	MOWP	Ministry of Water and Power
AEZs	Agro-Ecological Zones	MPNR	Ministry of Petroleum and Natural Resources
AJK	Azad Jammu Kashmir	MSW	Municipal Solid Waste
AJKED	Electricity Department of Azad J. Kashmir	NCHD	National Commission for Human Development
ARI	Acute Respiratory Infection	NGOs	Non-Governmental Organizations
CAA	Civil Aviation Authority	NHA	National Highway Authority
CAS	Country Assistance Strategy	NWFP	North West Frontier Province
CFAA	Country Financial Accountability Assessment	OMC	Oil Marketing Companies
CISP	Community Infrastructure and Services Project	P&DD	Planning and Development Department
CMU	Concrete Masonry Unit	PESCO	Peshawar Electricity Supply Company
DAC	Disaster Assessment and Coordination	PHC	Primary Health Care
DECC	District Emergency Coordination Committee	PHED	Public Health Engineering Department
DFID	Department for International Development	PIFRA	Project to Improve Financial Reporting and Auditing
DPL	Development Policy Loan	PIHS	Pakistan Integrated Household Survey
ECLAC	Economic Commission for Latin America and the Caribbean	PPAF	Pakistan Poverty Alleviation Fund
EMG	Emergency Management Group	PRSC	Poverty Reduction Support Credit
ERC	Emergency Relief Cell	PRSP	Poverty Reduction Strategy Paper
ERP	Earthquake Recovery Program	PSCB	Public Sector Capacity Building
ERRA	Earthquake Reconstruction and Rehabilitation Authority	PWD	Public Works Department
FAO	Food and Agricultural Organization	RCC	Reinforced Cement Concrete
FHA	Frontier Highway Authority	SAC	Structural Adjustment Credit
GDP	Gross Domestic Product	SC	Steering Committee
GIS	Geographical Information System	SHYDO	Sarhad Hydro Development Organization
GOP	Government of Pakistan	SMEDA	Small and Medium Enterprise Dev. Authority
GTZ	German Agency for Technical Cooperation	STG	Secondary Transmission and Grid
HIV	Human Immunodeficiency Virus	SUPARCO	Space and Upper Atmosphere Research Commission
IBRD	International Bank for Reconstruction and Development	TMA	Tehsil Municipal Administration
IDA	International Development Association	UN	United Nations
IESCO	Islamabad Electricity Supply Company	UNDP	United Nations Development Programme
IFAD	International Fund for Agricultural Development	UNESCO	United Nations Education, Scientific and Cultural Organization
JBIC	Japan Bank for International Cooperation	UNFPA	United Nations Population Fund
JICA	Japan International Cooperation Agency	UNICEF	United Nation Children's Fund
KfW	Kreditanstalt für Wiederaufbau	USAID	United States Agency for International Development
LGRDD	Local Government and Rural Development Department	WAPDA	Water and Power Development Authority
LHW	Lady Health Workers	WEF	World Economic Forum
		WHO	World Health Organization

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**PAKISTAN
2005 EARTHQUAKE**

PRELIMINARY DAMAGE AND NEEDS ASSESSMENT

Prepared by the Asian Development Bank and the World Bank

October 24 – November 5, 2005

PREFACE

1. At the request of the Government of Pakistan, a mission led by the Asian Development Bank (ADB) and the World Bank conducted a preliminary damage and needs assessment. This assessment estimates the damage and reconstruction costs of the October 8, 2005 earthquake that struck areas of the North West Frontier Province (NWFP) and Azad Jammu and Kashmir (AJK) in Pakistan. Experts from the government as well as international organizations, including the European Union, the United Kingdom's Department for International Development (DFID), the German Agency for Technical Cooperation (GTZ), the German KfW, the Japan Bank for International Cooperation (JBIC), the Japan International Cooperation Agency (JICA), the United States Agency for International Development (USAID), the World Health Organization (WHO), the UN Food and Agriculture Organization (FAO), the UN Children's Fund (UNICEF), the United Nations Development Programme (UNDP), and other UN agencies, also participated in this assessment. The mission benefited from the guidance and support of a core group of seven donors including the ADB, DFID, the European Union, Japan, UN, USAID, and the World Bank.

2. The team's objectives were to conduct, in coordination with the government, development partners, civil society, and other stakeholders, a preliminary assessment of the damage caused by the earthquake. It also estimated the related economic implications of the event. In addition to the damage assessment, the team was asked to assess the emerging needs of the affected communities to be reflected in the medium to longer term reconstruction and recovery phases following the initial relief efforts. Thus, this assessment aims to provide decision-makers and stakeholders with a quantitative basis on which to design a comprehensive reconstruction strategy and to request assistance. Policies and priorities set out during the relief stage often influence the development of the recovery strategy.

3. The United Nations (UN) has conducted a parallel assessment with a particular focus on immediate recovery and relief needs of affected communities. To arrive at an overall cost of the earthquake which would include relief, early recovery and reconstruction costs, and in order to avoid duplication of efforts, this joint assessment includes inputs from the UN assessment on relief and early recovery. This assessment focuses on reconstruction costs and restoration of livelihoods in the most severely affected areas of Pakistan.

4. Team members visited the eight most heavily affected districts of Abbottabad, Batagram, Kohistan, Poonch, Mansehra, Muzaffarabad, Bagh, and Shangla to verify and evaluate the intensity of damage incurred during the disaster and to meet with civil administration authorities and affected people. The assessment team also met with a range of civil society, international, governmental and development partner organizations to gain an understanding of the full spectrum of issues that may influence the recovery strategy.

5. The data presented in this assessment are based on government sources, team research, and a field assessment conducted by consultants to ensure adequate coverage and verification of affected areas. It is important to note that these estimates are preliminary due to the quick turnaround time required for an

assessment of this nature and to the daily changes in data on damage and deaths, as time progresses and as relief assistance reaches affected areas.

EXECUTIVE SUMMARY

6. In Pakistan, the earthquake that struck on the morning of October 8, 2005 left widespread destruction in its wake, killing at least 73,000 people, severely injuring another 70,000, and leaving 2.8 million people without shelter. AJK and eastern NWFP were dealt the most serious blow and have suffered extensive damage to economic assets and infrastructure, with social service delivery, commerce, and communications either debilitated or destroyed. Vulnerable groups, mainly women and children living in inaccessible mountain areas with low levels of income and service provision, have borne the brunt of the earthquake's impact.

7. In addition to the enormous human toll, the earthquake and its aftermath will pose a large cost to Pakistan. The overall cost associated with the earthquake is estimated at approximately US\$5.2 billion, which includes estimated costs for relief, livelihood support for victims, and reconstruction (Table 1).

Table 1: Overall Costs of the Earthquake

Category	US\$ Million
Relief	1,092
Death and Injury Compensation	205
Early Recovery	301
Restoration of Livelihoods	97
Reconstruction	3,503
<i>Of which Short term Reconstruction</i>	450
<i>Of which Medium/Long term Reconstruction</i>	3053
Total	5,198

Note: Excludes indirect losses (income) of \$576 million - see Table 2

Sources:

Relief, Death and Injury Compensation and Early Recovery - UN Agencies

Reconstruction and Restoration of Livelihoods - ADB/WB Assessment Team

8. This report focuses on an assessment of damage and reconstruction costs. It has a companion report, entitled "Early Recovery Framework", which was led by the United Nations. These two companion reports have been coordinated to ensure consistency and facilitate coordination.

Overview of Damage and Needs

9. This report presents estimates for: (i) the loss of public and private assets (direct damage at book value) in the eight most affected districts, estimated at US\$2.3 billion, and the loss in income (indirect loss), estimated at US\$576 million (Table 2); (ii) the cost of short (up to 18 months) and medium to longer term (up to three years) reconstruction of private and public assets (at replacement costs), estimated at US\$3.5 billion (Table 2); and (iii) the cost of a livelihoods restoration program, estimated at US\$97 million.

10. The direct damage caused by the earthquake is estimated at approximately Rs. 135.1 billion (US\$2.3 billion). Private housing, with damages calculated at Rs. 61.2 billion (US\$1.03 billion), suffered the most extensive damage. The earthquake destroyed 203,579 units of housing, damaged another

196,574 and left an estimated 2.8 million people in need of shelter. Of the total housing stock, 84 percent was damaged or destroyed in AJK and 36 percent was damaged or destroyed in NWFP. The transport, education, and agriculture and livestock sectors also suffered sizable damage, totaling Rs. 20.2 billion (US\$340 million), Rs. 19.9 billion (US\$335 million), and Rs. 12.9 billion (US\$218 million), respectively.

11. The cost of reconstruction of lost assets and the restoration of services is estimated to be Rs. 208.1 billion (US\$3.5 billion). A substantial portion of these funds is on account of housing reconstruction, which will cost an estimated Rs. 92 billion (US\$1.6 billion).

Table 2: Preliminary Estimate of Total Losses and Reconstruction Costs as of November 10, 2005

Sector	Direct Damage (Rs. mill.)	Indirect Losses (Rs. mill.)	Reconstruction Costs* (Rs. mill.)	Reconstruction Costs* (US\$ mill.)	Share of Total Reconst. Costs (%)
1. Social Infrastructure					
Private Housing**	61,220	7,218	92,160	1552	44
Health	7,114	1,378	18,012	303	9
Education	19,920	4,133	28,057	472	13
Environment	12		8,985	151	4
Public administration	2,971	687	4,254	72	2
2. Physical Infrastructure					
Transport***	20,165	4,061	24,699	416	12
Water Supply and Sanitation	1,165		1,900	32	1
Irrigation	324		623	10	0
Energy, power and fuel	744	1,561	2,377	40	1
3. Economic Sectors****					
Agriculture and livestock	12,933	6,770	17,846	300	9
Industry and Services	8,578	8,379	9,178	155	4
4. Total = 1+2+3 (in Rs. Million)					
o/w : Azad Jammu and Kashmir	76,375	17,671	116,625	1,963	56
: North West Frontier Province	56,436	16,516	91,467	1,540	44
o/w : Public Assets	45,795	12,175	82,187	1,384	39
: Private Assets	87,015	22,012	125,904	2,120	61
o/w : Urban Areas	25,789	13,675	46,163	777	22
: Rural Areas	107,021	20,512	161,928	2,726	78

Notes: * Includes cost of reconstruction of both immovable and movable assets and restoration of public services.

** Includes value of household contents such as consumer durables; reconstruction costs exclude replacement of these assets.

*** Includes roads and bridges.

**** Total losses and reconstruction costs in agriculture, industry and services are over and above what is accounted for by the sectors listed above.

12. This assessment report emphasizes the need to take into account guiding principles—including the rapid rebuilding of people's livelihoods, independence and self-sufficiency, subsidiarity and decentralization, a focus on most vulnerable and socially disadvantaged groups, securing development gains, strengthening capacities to manage the recovery process, transparency and accountability, reducing Pakistan's vulnerability to future disasters, encouraging the private sector and civil society engagement, and coordination and coherent approaches to recovery—during the development of a comprehensive recovery strategy.

A. BACKGROUND OF THE 2005 EARTHQUAKE

13. **Overview.** On October 8, 2005, at 8:50 PST, a magnitude 7.6 earthquake occurred in Pakistan, Afghanistan, and India. The earthquake epicenter was located 100 kilometers north-northeast of Islamabad, along a fault associated with the Indian subcontinent moving northward at a rate of about 40 mm/yr and colliding with the Eurasian continent. Tremors were felt across a wide swath of South Asia, from central Afghanistan to western Bangladesh. As of October 27th, more than 1,000 aftershocks were recorded in the India-Pakistan Kashmir region, ranging from magnitude 5.0 to 6.0.

14. The 2005 earthquake is arguably the most debilitating natural disaster in Pakistan's history. Pakistan-administered Kashmir, known as Azad Jammu and Kashmir (AJK),¹ and the eastern Districts of the North West Frontier Province (NWFP) bore the full force of the earthquake in terms of number of lives lost, injuries sustained, and destruction of infrastructure and economic assets. In at least three Districts in AJK and five in NWFP, public and private housing and shelter infrastructure, social service delivery, governance structures, commerce, and communications have been either damaged or destroyed.

15. According to Government of Pakistan figures, as of November 3, approximately 73,000 people had died and more than 70,000 had been severely injured or disabled. Over 2.8 million persons have been left without shelter, and it is estimated that about 2.3 million persons are without adequate food. Terrain in affected areas of both NWFP and AJK is highly diversified and includes densely populated as well as rugged mountainous areas comprised of small scattered rural settlements. Official estimates of damage remain conservative as more isolated communities in the earthquake affected region remain inaccessible, which foreshadows an increase in official figures as these areas are reached. Furthermore, the UN has issued a warning indicating more lives will be lost if additional relief does not materialize before the imminent onset of the Himalayan winter.

16. **The Government response.** The Government of Pakistan responded quickly to the earthquake emergency. Although communications with the most severely affected areas and populations were severed, the President and Prime Minister visited affected sites the first day after the disaster. Two Army Divisions moved into NWFP and AJK and set up five advanced staging posts for facilitation and distribution of relief goods. The geography of some affected areas has led the Government of Pakistan to call for an unprecedented number of helicopters to assist with the distribution of relief goods. As of November 2, a fleet of more than 125 helicopters and aviation vessels, both foreign and domestic, have made over five thousand sorties to affected areas.

17. A President's Relief Fund has been established to mobilize resources for relief efforts. The Prime Minister has outlined a 12-point national strategy for reconstruction and rehabilitation. The Prime Minister's office has appointed a Federal Relief Commission and corresponding Relief Coordinator, with the overall responsibility for overseeing relief efforts targeting shelter, food, clean water and immediate medical care. At the District and grassroots levels, military relief personnel have been stationed to facilitate the distribution of relief goods. Furthermore, the President has established an Earthquake Reconstruction and Rehabilitation Authority (ERRA) to facilitate the rebuilding and repair of damaged infrastructure, including housing, roads, bridges, government buildings, schools and hospitals.

18. As of November 11th, the Government of Pakistan had distributed 350,000 tents, 3.2 million blankets, 3,000 tons of medicine, and established tent villages for earthquake-affected persons. The Government has made available army medical teams comprised of medical officers and paramedics in at least thirteen stations in and around affected districts of AJK and NWFP. The Government has also

¹ Azad Jammu and Kashmir (AJK) is the Pakistan-administered portion of an area over which India and Pakistan have been in dispute since 1947. The assessment team does not intend to make any judgment as to the legal or other status of any disputed territories or to prejudice the final determination of the parties' claims.

announced a program that includes compensation of Rs. 100,000 for families who have lost members, Rs. 50,000 for those individuals who have sustained serious injuries, and Rs. 25,000 for those with minor injuries. The maximum amount of assistance given to each family under this program is Rs. 500,000, and disbursements have already begun.

19. **Civil society response.** A 'nation united' characterizes the strong civil society response throughout Pakistan and among expatriates living abroad. Small self-help groups have been formed in many of the affected areas and are being supported by tens of thousands of people throughout Pakistan who are collecting relief goods, often at the neighborhood level. A host of international and local Non-Governmental Organizations (NGOs) are working to provide emergency relief in affected areas, including the Edhi Foundation; Islamic Relief; Red Crescent Society; Citizen's Foundation; Mir Khalil-ur-Rahman Foundation; World Vision; Agha Khan Foundation; Save The Children; Oxfam; and the Rural Support Program Network. Individuals have donated millions of dollars towards relief efforts, often through the President's Relief Fund and civil society organizations working in the affected areas. A number of expatriate Pakistanis and academics have designed a web-based relief and information system that complements Government web-based initiatives. In total, civil society has mobilized nearly Rs. 6 billion (US\$100 million) in donations and has provided clothing, temporary shelter, food, medicines and other in-kind items and services to the victims.

20. **International community response.** The Government of Pakistan requested international assistance, which started arriving within days of the earthquake. As of November 11th, according to Government reports, assistance totaling nearly US\$2.5 billion has been pledged by a total of 83 bilateral as well as multilateral donors, with many also providing significant in-kind support including logistical and manpower assistance to the relief efforts. Major contributions have been pledged by Saudi Arabia, USA, Japan, Turkey, Kuwait, United Arab Emirates, UK, Canada, Iran, Norway, Germany, China, Netherlands, Switzerland, India, Sweden, Denmark and Australia. Other donors include Italy, France, Ireland, Finland, Oman, Belgium, South Korea, Ukraine, Luxembourg, Austria, Algeria, Malaysia, Greece, and others. The World Bank approved supplemental financing of US\$200 million within weeks of the earthquake to help the Government meet emergency expenditure requirements. The United Nations immediately deployed its Disaster Assessment and Coordination (UNDAC) Team to provide technical assistance to assess the scale of the disaster and help manage the international response. The United Nations Development Programme (UNDP) is helping coordinate relief efforts at both national and local levels. Other UN specialized agencies such as United Nations Children's Fund (UNICEF), the World Food Programme (WFP), and the United Nations Population Fund (UNFPA) have also provided emergency relief assistance.

21. On October 26th, the Secretary-General of the United Nations hosted a Ministerial-level international donors' conference in Geneva to discuss Pakistan's short term relief assistance requirements. The UN launched a flash appeal of US\$550 million as immediate relief assistance to Pakistan. About US\$140 million has been earmarked for an emergency push to feed and provide shelter to those affected. The Geneva conference is being followed by another multi-donor event in Islamabad, scheduled for November 19, 2005, aimed at boosting resources for the medium to longer term reconstruction and rehabilitation programs.

22. **Private sector response.** The private sector has shown generous support to the earthquake affected population, with donations ranging from cash assistance to business services. For example telecommunication companies were quick to provide telecommunication services in the affected areas in order to ensure smooth relief operations. They also set up free public call offices and started fundraising drives. International and national courier services used their logistics expertise to ensure that incoming international relief supplies arriving on chartered flights were handled as quickly and efficiently as possible. Some companies have also launched 'adopt a village' schemes.

23. Despite these positive responses to the disaster, it is important to note that a significant financing gap remains, which must be addressed in order to minimize further economic and social setbacks to the people of Pakistan.

B. CONDITIONS IN AFFECTED AREAS BEFORE THE EARTHQUAKE

24. The area most heavily damaged by the earthquake incorporates AJK and the eastern Districts of NWFP. This region is home to a scattered population of some 5.7 million people. The social structure in this region is closely-knit, and families on average comprise 7 people per household. About 88 percent of residents live in hilly, mountainous rural settlements, which range in size from 2 households to more than 300. The region's population is relatively young: nearly half (42 percent) of the population is below the age of 15 years, while 6.7 percent of the population is above the age of 60. A high proportion of the population lacks basic services and facilities like clean drinking water and safe disposal of waste. The region is also an area of extreme environmental vulnerability, characterized by frequent landslides and unchecked urban development with few environmental safeguards.

25. Agriculture and livestock rearing are the primary sources of employment in rural areas. Most rural residents engage in subsistence agriculture, with agriculture accounting for 60 to 70 percent of total household income and 37 percent of total rural employment. Public administration accounts for a significant proportion of employment in the affected urban areas; followed by small trading and businesses, construction and transport, mostly in the informal sector. Employment in public administration is especially prominent in AJK, and agriculture conversely employs a higher fraction of the rural population in NWFP. Notably, for all affected areas, remittances from migrant male family members are a vital source of income. Options for women to become employed outside of the household are very limited, even though, due to labor migration, the proportion of women-headed households is fairly high. In AJK, for instance, approximately 20 percent of households are headed by a female.

26. Overall, the private sector in the affected areas is largely dominated by medium, small-scale and unregistered enterprises, often household-based. The region's manufacturing and financial sectors are small and offer few employment opportunities. Mounting population pressures and land fragmentation have overburdened subsistence agriculture, spurring widespread seasonal migration to urban centers and abroad. Remittances are thus an important source of income and account for approximately a quarter of household's consumption expenditure, even for the poorest quintiles in AJK and NWFP.

C. GUIDING PRINCIPLES OF THE NEEDS ASSESSMENT AND RECOVERY STRATEGY

27. Moving from the relief phase toward comprehensive recovery that meets the needs of the affected population requires a common framework, to be adopted by all organizations and institutions involved, to ensure speed, consistency and equity across rehabilitation efforts. The following guiding principles were formulated by the international development partners and outline key areas that may be shared and adhered to by all parties when planning and implementing recovery activities. The ADB-World Bank joint assessment team has used these ten points as a basis for its analysis in the needs assessments and proposed recovery strategies by sector.

- ***Rapid rebuilding of people's livelihoods.*** Accelerate the revitalization of the local economy – revival of production, trade and the creation of income and employment opportunities in support of people's own initiatives.
- ***Independence and self-sufficiency.*** Maximize use of local initiative, resources and capacities. Base planning and execution on local knowledge, skills, materials and methods, and enterprise,

taking into account the need for affordable solutions. Ensure community participation in all aspects of the recovery process and partner with local institutions.

- ***Subsidiarity and decentralization.*** Take decisions on plans, design and implementation at the lowest level possible, to ensure community ownership and empowerment, and to ensure solutions are locally appropriate.
- ***Focus on the most vulnerable and socially-disadvantaged groups, such as children, women, and the disabled.*** Disasters increase the vulnerability of all, but especially of those who are already disadvantaged. Recovery programming needs to give priority to the most vulnerable groups, including female-headed households, children and orphans, and the poor, and take account of those with special needs, to avoid their being overlooked.
- ***Secure development gains and progress in poverty reduction.*** Disasters can reverse hard-won gains in poverty reduction and development, risking a downward spiral of decline. Recovery planning must attempt to re-establish and secure previous development gains. In addition, the poor in areas not affected by the disaster (the vast majority in the case of Pakistan) should not lose out due to increased allocation of public resources to the earthquake-affected areas at the expense of the rest of the country. Ensuring the dual objectives of rehabilitating and rebuilding earthquake affected communities and accelerating Pakistan's development will require additional resource mobilization by Pakistan and the international community.
- ***Restoring capacities to manage the recovery process.*** The capacity of local public administration, including infrastructure, must be rebuilt. Along with local and national institutions, encourage and empower all levels of civil society to participate in and manage the recovery process.
- ***Transparency and accountability.*** Achieve accountability through ensuring the effective operation of the judicial system. Achieve transparency through open processes and wide dissemination of information on all aspects of the recovery process.
- ***Avoid the creation of new disaster risks.*** While avoiding radical redesign and restructuring of neighborhoods and towns, ensure that sensible and realistic measures are taken to achieve development progress, protect the environment, and reduce future disaster risks.
- ***Encourage engagement of private sector and civil society.*** Mobilize private investment – both human and financial. Ensure the local private sector has incentives and technology to participate fully in reconstruction and that financial and human contributions from companies and individuals, as well as wider Pakistani diaspora beyond Pakistan, are harnessed.
- ***Coordinated and coherent approaches to recovery.*** Ensure full and effective coordination among all involved agencies based on comprehensive information exchange, flexibility in administrative procedures, surveillance of any rent-seeking activity during implementation, and uniformity of policies.

D. PRELIMINARY DAMAGE AND NEEDS ASSESSMENT

28. This section presents the methodology utilized to conduct the overall assessment as well as the damage and needs estimates for the following sectors: social and environmental aspects, housing,

livelihoods, agriculture, transport, education, health, water supply and sanitation, energy, governance and institutions, and the industry and services.

29. **Methodology.** The impact of the earthquake on each sector of the economy includes the following three costs: (i) Direct Damage; (ii) Indirect Losses; and (iii) Reconstruction Cost. *Direct Damage* refers to the monetary value of the completely or partially destroyed assets, such as social, physical and economic infrastructure (including final goods, goods in transit or process, raw materials, materials and spare parts), immediately following an earthquake. Wherever possible, the direct damage for assets is assessed in “as was” condition, i.e., at their book values (see Box 2 in Annex 1). *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 at the replacement cost, and in the case of this report, it is defined to include the additional costs incurred for earthquake resistance.

30. The macroeconomic impact highlights ways in which the disaster may alter the country’s main economic variables, including on the rate of economic growth, balance of payments and current account, and inflation.

31. A rapid multi-sector data collection exercise was undertaken by the team to facilitate a comparative pre- and post-earthquake assessment of the infrastructure and services affected. Data were collected by a combination of multi-sector field assessments, desk reviews, aerial reconnaissance, site visits by sector specialists, and interviews with stakeholders. Given the diverse nature of available pre-earthquake baselines, and the post-earthquake datasets, four key principles were established to ensure timely availability of consistent data for all the sectors.

32. The key principles were as follows: (i) for each District, coordinate with District Officials and the Army’s Support Network in the District to ensure that they can provide an overview and facilitate data collection from as many reliable sources (both in the district and elsewhere) as possible; (ii) use sector experts familiar with the affected areas pre-earthquake, expose them to post-earthquake conditions through rapid aerial reconnaissance and ground missions, and then use them to help identify the final, reliable datasets to be used for each sector; (iii) ensure that pre-earthquake data are time-normalized across the various sectors to reflect the best possible baseline for 2005 – e.g., a lot of the pre-earthquake data were available from the last Census, but the last Census provided 1998 baseline data which had then to be projected based on reasonable assumptions to 2005; and (iv) close the post-earthquake data collection at a convenient point in time so that consistent analysis and post earthquake needs assessment could be carried out. Thus, the preliminary assessment report is based on a comprehensive dataset with several plausibility reviews incorporated.

33. The field survey team was comprised of one assessment consultant per affected District (eight districts were included: Abbottabad, Shangla, Mansehra, Batagram, and Kohistan in NWFP; and, Bagh, Muzaffarabad, and Poonch in AJK).² Each assessor travelled through the affected District, collected multi-sectoral data, and cross referenced all information available from the line agencies at the provincial and district levels and from other organizations working on the relief efforts in the affected Districts. While the assessors were in the field, they constantly consolidated the data and transmitted them by facsimile to the data consolidation team in Islamabad. The team in Islamabad reviewed the collected data in real time and sent additional queries (as required) to the assessors in the Districts to ensure that inconsistencies could be clarified and further details requested where required.

² While these eight Districts were the most severely affected, other Districts suffered damage, including: Malakand, Buner, Swat, and Haripur.

34. Final data consolidation was performed in Islamabad, and upon consolidation, quantitative and qualitative pre- and post-earthquake data were developed. Data were checked for consistency and plausibility as well as updated as information and clarifications were received from stakeholder agencies through October 26, 2005. In parallel, the aerial reconnaissance of the entire affected area was undertaken by the sector teams between October 25 and October 26 to revalidate the data and to assess the nature of the damage in the affected areas. Comments and new data were received from the Government during the week of November 7, which were used to update estimates of losses and reconstruction costs.

Social Aspects

35. The rising death toll in the aftermath of the October 8th earthquake has had a serious impact on the population and social structures of the earthquake-hit areas. The main victims were already vulnerable groups, living in comparatively inaccessible mountain areas with lower levels of income and service provision as compared to the national average. Due to difficulties in access, many victims were not rescued and treated in time, and succumbed to their injuries.

36. **Unattended children.** With the number of unattended children unknown, special protection is required for this group. Top priorities include family reunification in the case of separated children, the provision of culturally-sensitive interim and alternative care options, and the protection of children's legal rights.

37. **Single-headed households.** The loss of a mother has a negative physical and psychological impact on small children, while the loss of the male head of family constitutes a serious economic blow since there are limited economic options for women outside the household. The prevalent social norms do not encourage the growing numbers of widows, single women, and women-headed households to access relief and go to the tent camps outside their local area since they will be among unrelated men. Likewise, medical teams find it difficult to access injured women unless they have female staff. Privacy for displaced women and girls is thus an important consideration.

38. **Legal rights.** Since women in many of the affected areas customarily relinquish their claims to joint family property, the risk of widows and female orphans losing their rightful inheritance is considerable in the present situation, where traditional mechanisms of social support may be destroyed. Restoring lost records of property rights to housing, commercial property, and land should be launched as soon as possible, with special assistance given to vulnerable groups, such as widows and orphans.

39. **Disabled.** Disabled, elderly, and other vulnerable groups will be disadvantaged in accessing relief and warrant special consideration. Specific measures are required to address the needs of the large numbers of injured people who will be permanently disabled due to severe injuries, such as injuries to the spinal cord, head and limbs. This will require the development of mechanisms to provide long term care where needed, as well as support for rehabilitation, employment and skills development for people with disabilities. Reconstruction efforts should take into account the need to ensure that rebuilt facilities, especially schools, health facilities, and public offices, are accessible to people with disabilities.

40. **Psychological shock and trauma.** Severe shock and trauma are widespread among the affected population in the earthquake's aftermath. Psycho-social support is therefore needed for surviving family members, particularly widows, single-parent children, orphans, and the elderly.

41. **Community participation.** The involvement of communities will be essential to preserve existing social networks that form the basis of support among affected households. Local communities will need to be actively involved in the decision-making and implementation of reconstruction activities.

Environmental Aspects

42. Although the dominant losses were sustained to humans and structures, the earthquake has also resulted in adverse impacts on the environment. The impact on ecosystems is often less dramatic than structural damage, due to the relatively slower manifestation of ecosystem damage. But considering that the environment of the affected area was vulnerable before the earthquake and comprises fragile mountain ecosystems, significant long term impacts may be likely. A detailed environmental assessment of the impacts of the earthquake will be needed to quantify losses to forestry, aquatic and terrestrial ecosystems, including biodiversity, and to restore damaged ecosystems.

43. Environment is intricately linked to the livelihoods of the affected communities because of their dependence on natural resources. Environment and natural resource issues must therefore be an integral part of all sectoral plans for reconstruction and recovery. While the country had little control over the negative environmental impacts from the earthquake, it can influence preventive environmental and natural resource impacts of reconstruction.

44. **Rubble and debris disposal.** One of the most visible consequences of the earthquake is the enormous quantity of debris and rubble resulting from damaged and destroyed structures. Preliminary estimates indicate that up to 200 million tons of rubble may need disposal. Therefore, a rubble and debris management plan that encourages reuse and recycling of rubble, as well as identifies suitable disposal sites for the remaining refuse, is urgently needed to prevent haphazard dumping of rubble and its associated adverse environmental impacts.

45. **The natural environment.** The main environmental impacts of the earthquake were the result of landslides. While the exposed soil surfaces presently appear to be in a state of dry equilibrium, a second phase of landslides is likely, and is largely unpreventable due to the onset of rain and the melting of spring snow. The denudation of forest cover over the last decade due to encroachment, illegal timber felling and agriculture likely exacerbated the adverse impacts of the landslides. This risk continues today as the timber demand for reconstruction could result in further denudation of forests.

Economic Impact

46. **Direct damage.** Preliminary estimates of the direct damage sustained due to the earthquake total Rs. 135.1 billion (US\$2.3 billion), as presented below in Table 2. These estimates are based on the book value of the assets. The largest component of this damage is to private housing, which amounts to Rs. 61.2 billion (US\$1.03 billion), followed by damage to the transport sector totaling Rs. 20.2 billion (US\$340 million), and to the education sector equaling Rs. 19.9 billion (US\$335 million). Direct damage to agriculture and livestock is also sizeable, totaling Rs. 12.9 billion (US\$218 million). The losses to industry and services amount to Rs. 8.6 billion (US\$144 million).³

47. The level of direct damage is higher in AJK than in NWFP. For AJK, it amounts to Rs. 76.4 billion (US\$1.3 billion) and for NWFP, Rs. 56.4 billion (US\$950 million). In most sectors, the destruction of physical assets in AJK is higher than in NWFP, as is its monetary value.

48. **Indirect losses.** The indirect losses resulting from the direct damage are Rs. 34.2 billion (US\$576 million). The indirect losses are comparable in absolute values between NWFP and AJK. The estimated indirect losses do not take into account the effect of rehabilitation and reconstruction activities on future output. Reconstruction will lead to not only restoration of physical assets, but also flows of

³ The direct damage to services and industry includes destruction of physical assets in wholesale and retail trade, hotels and restaurants and banking sector. Damage to the private sector health organizations is not included.

production of goods and services. Hence, the estimates of indirect losses presented above are likely to be on the higher side for output losses.

Table 2: Preliminary Estimate of Total Losses and Reconstruction Costs as of November 10, 2005

Sector	Direct Damage (Rs. mill.)	Indirect Losses (Rs. mill.)	Reconstruction Costs* (Rs. mill.)	Reconst. Costs* (US\$ mill.)	Share of Total Reconst. Costs (%)
1. Social Infrastructure					
Private Housing**	61,220	7,218	92,160	1552	44
Health	7,114	1,378	18,012	303	9
Education	19,920	4,133	28,057	472	13
Environment	12		8,985	151	4
Public administration	2,971	687	4,254	72	2
2. Physical Infrastructure					
Transport***	20,165	4,061	24,699	416	12
Water Supply and Sanitation	1,165		1,900	32	1
Irrigation	324		623	10	0
Energy, power and fuel	744	1,561	2,377	40	1
3. Economic Sectors****					
Agriculture and livestock	12,933	6,770	17,846	300	9
Industry and Services	8,578	8,379	9,178	155	4
4. Total = 1+2+3 (in Rs. million)	135,146	34,187	208,091	3,503	100
o/w : Azad Jammu and Kashmir	76,375	17,671	116,625	1,963	56
: North West Frontier Province	56,436	16,516	91,467	1,540	44
o/w : Public Assets	45,795	12,175	82,187	1,384	39
: Private Assets	87,015	22,012	125,904	2,120	61
o/w : Urban Areas	25,789	13,675	46,163	777	22
: Rural Areas	107,021	20,512	161,928	2,726	78

Notes:

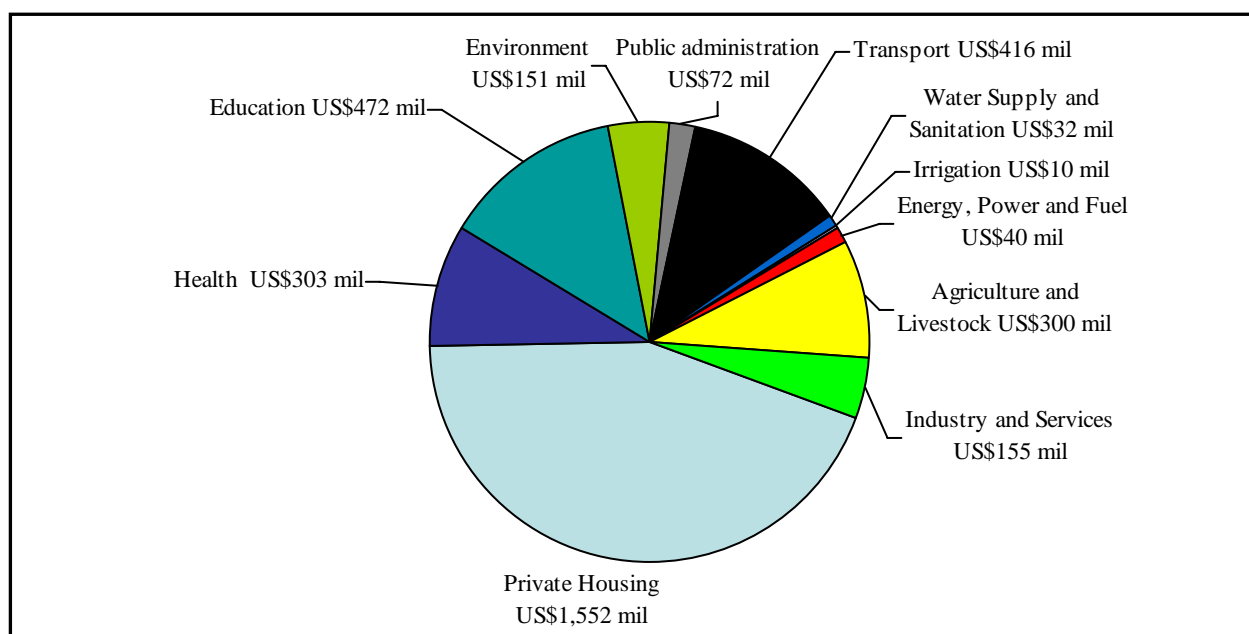
* Includes cost of reconstruction of immovable assets and restoration of public services.

** Includes value of household contents such as consumer durables; reconstruction costs exclude replacement of these assets.

*** Includes roads and bridges.

**** Total losses and reconstruction costs in agriculture, industry and services are over and above what is accounted by the sectors listed above.

49. **Reconstruction costs.** The cost of reconstruction of lost assets and of the restoration of public services is estimated to be Rs. 208 billion (US\$3.5 billion). A breakdown of reconstruction costs by sector is presented below in Figure 1. The reconstruction costs are valued at improved standard replacement rate, including the cost of rebuilding to earthquake resistant standards in a manner suitable to local conditions. This is necessary given the high degree of exposure to natural disasters in the affected areas.

Figure 1: Reconstruction Cost by Sector (Total: Rs. 208 bn; US\$3.5 bn)

Macroeconomic Effects

50. **Real sector.** The impact of the earthquake on Pakistan's official GDP (which excludes GDP from AJK) is expected to be relatively small, in the order of 0.4 percent.⁴ Pakistan's official GDP growth for FY06 was projected by the Government of Pakistan in June at 7 percent. However, recent crop data on cotton and sugarcane suggest that growth will be around 6.5 percent. The additional impact of the earthquake is likely to bring output growth further down, to around 6.2 percent, due to a projected reduction in NWFP output for FY06.⁵

51. **Fiscal impact.** At the macroeconomic level, the most significant impact of the earthquake is expected to be on the fiscal deficit of the Government of Pakistan. In the absence of any offsetting revenue increases and expenditure reductions, the earthquake is projected to increase the FY06 deficit of the Government of Pakistan by 0.6 to one percent of GDP. The Government has expressed its commitment to a sustainable fiscal stance and to continued debt reduction; it is expected that it will announce measures to mitigate, at least partially, the negative fiscal impacts of this shock. NWFP's and AJK's budgets will be unable to accommodate a significant share of the relief and reconstruction expenditure, although it is to be expected (and desirable) that they would have significant role in the reconstruction process.

52. **External sector.** There have been pressures on the external sector arising from strong aggregate demand and factors not directly related to the earthquake. The earthquake may cause an increase (albeit limited) in imports of fuel, food, and construction materials. A delay in aid inflows to finance GoP earthquake expenditures would aggravate pressures on the balance of payments.

⁴ This assumes that all of the income loss will fall in fiscal year 2005/06, an assumption that may overstate the impact of the earthquake on growth.

⁵ When AJK's estimated GDP is added to Pakistan's overall output and to GDP losses, the impact of the earthquake rises to 0.7 percent.

53. ***Sustaining rapid growth and poverty reduction while launching the earthquake recovery.*** The earthquake has now created additional expenditure needs for relief, reconstruction, and rehabilitation cost. These pressures could pose difficulties for Pakistan's macroeconomic balances and may undermine the achievement of its long term development goals, unless additional concessional financing is made available by the international community. A key element of Pakistan's PRSP is the utilization of the additional fiscal space created by prudent fiscal policy and aid to meet development and poverty alleviation objectives. It is, therefore, important that priority public expenditures be protected, so that Pakistan can continue to improve service delivery of health, education, and public infrastructure. The Government has indicated that it would be prepared to absorb a part of the budgetary impact of the earthquake by making cuts in low-priority expenditures and raising additional domestic revenue. These adjustments would be needed irrespective of the amount and type of financing that the donor community would provide. However, given the magnitude of resources for rehabilitation of the affected areas, it is unlikely that the Government will be able to fully absorb the fiscal impact of the earthquake without significantly affecting public sector development activities.

Sector by Sector Analysis

54. This section gives an overview of the damage and recovery needs by sector. Detailed assessments of each sector are provided in the attached annexes.

55. ***Housing. (a) Damage – Rs. 61.2 billion (US\$1.03 billion).*** Across AJK and NWFP, the earthquake destroyed 203,579 housing units, while 196,574 were damaged to various degrees. These include 116,572 destroyed and 88,368 damaged in AJK, and 87,007 destroyed and 108,205 damaged in NWFP. Losses to the housing sector represent 84 percent of the total housing stock in the affected Districts of AJK, and 36 percent of housing stock in the five affected Districts of NWFP. The affected houses are predominantly rural, with urban units accounting for only 10 percent of the total. Much of the rural housing is located on steep slopes, causing difficulties in access.

56. ***(b) Reconstruction needs and strategy – Rs. 92.2 billion (US\$1.55 billion).*** The reconstruction strategy for the housing sector is underpinned by the following nine principles: (i) promote hazard-resistant construction standards and designs; (ii) rebuild in-situ; (iii) ensure rebuilding is owner-driven; (iv) rebuild with familiar methods and easily accessible materials; (v) relocate settlements only when necessary; (vi) ensure urban replanning is limited and strategic; (vii) offer uniform assistance that is not compensation-based; (viii) coordinate multiple reconstruction initiatives and standards for equity; and (ix) link housing to livelihoods and infrastructure rehabilitation. The above cost estimates have been developed on the basis of one feasible design alternative, however other structural design options may also be appropriate based on local conditions, affordability, and seismic-resistant building standards.

57. In the short term, in addition to addressing the immediate sheltering needs of the affected population, the Government should begin preparing for the longer reconstruction phase. With the onset of winter, reconstruction activities could be reduced to a minimum, particularly in areas above the snowline. During this time, it will be important to undertake the following activities in preparation for reconstruction: (i) determine losses for establishing a baseline and eligibility levels; (ii) undertake seismic and soil investigations, particularly in the most affected areas; (iii) conduct training for safe construction techniques; (iv) disseminate information on available assistance packages and seismic-resistant designs; and (v) establish property rights. The reconstruction effort for permanent housing would predominantly begin in the spring with the provision of hazard-resistant housing for affected population through cash grants for basic housing assistance, beneficiary identification with compensation levels, and urban planning and development initiatives.

58. ***Livelihoods. (a) Overview.*** While the rest of the damage assessment captures the quantity of damage in terms of lost assets and outputs, the assessment of livelihood losses focuses on estimating the

impact on employment. Estimates show the total loss in employment to be around 324,000 jobs, or about 29 percent of the employed population (above age 10) in the affected Districts. About 38 and 25 percent of the total employment in the affected Districts of AJK and NWFP, respectively, are estimated to be lost. The largest job losses are in agriculture, small businesses/shops, and construction, while no employment loss is assumed for migrant workers and public sector employees. Employment losses will likely impact nearly 1.6 million people.

59. **(b) Recovery needs – Rs. 10.3 billion (US\$172 million, or US\$97 million, net of food).** Addressing the short term needs of this vulnerable population for a period of six months, assuming that food requirements are fully met through a continuing relief program described in the next paragraph, will notionally require an additional Rs. 3.5 billion (US\$59 million), but if basic food requirement is also included in the estimate, the amount will increase to Rs. 8 billion (US\$134 million). In addition, an estimated Rs. 2.3 billion (US\$38 million) will be needed for a recommended one-time grant to micro-entrepreneurs to help them rebuild lost assets.

60. The livelihood support strategy should also seek to rejuvenate economic activity in affected areas through reviving small businesses and trades, livestock and agriculture, and creating employment opportunities for those who are now permanently disabled. A short term option would be providing cash grants to affected families in the form of a monthly support of a recurrent, fixed amount. In addition, cash for work programs may be effective in generating temporary employment for those who are able and willing to work at an appropriate wage. Generating sustainable livelihoods in this post-disaster situation also critically requires providing access to finance, perhaps on soft or concessionary terms, to affected small/micro entrepreneurs and livestock owners. The high incidence of severe injuries, many of which may lead to permanent disabilities, also suggests the need for a strategy to rehabilitate and re-train such individuals as part of medium to long term recovery efforts, as mentioned above.

61. **Agriculture, Livestock and Irrigation. (a) Damage – Rs. 13.3 billion (US\$223 million).** Based on data from the UN FAO team and information from concerned government officials, the earthquake severely damaged crops, livestock and irrigation subsectors in both AJK and NWFP. Direct damage to crops includes loss of harvested and standing crops, disruption of terraces and soil conservation structures, spoilage of stored grains and animal feed, and structural damage and destruction to extension and research buildings amounting to Rs. 4.0 billion (Rs. 3.2 billion in AJK, Rs. 0.75 billion in NWFP). The indirect damage of Rs. 712 million (Rs. 529 million in AJK and Rs. 183 million in NWFP) represents value of wheat productivity losses in the coming *rabi* season and amortized value of fruit production. The direct damage to the livestock subsector equals about Rs. 9 billion, which is accounted for by the loss of large and small ruminants and poultry, animal sheds, and damage to extension and research buildings. The indirect losses to the livestock sector, mainly loss of milk productivity, are estimated at Rs. 6 billion (US\$102 million). The main damage to the irrigation subsector has been to the water channels, diversion structures, water lifts, spillways, and water tanks, amounting to Rs. 324 million (Rs. 240 million in AJK and Rs. 84 million in NWFP).

62. **(b) Recovery needs – Rs. 18.5 billion (US\$311 million).** The immediate requirements in the next month are for winter crops, mainly wheat cultivation, construction of temporary animal sheds for protection from severe cold, and repair of water channels. If support for wheat cultivation is not extended in time, the affected persons will be unable to grow wheat, which is their main staple. Similarly, if shelter for animals is not provided immediately, there will be substantial loss of the remaining livestock inventory. These needs would require an immediate support of Rs. 3.3 billion (US\$56.5 million). In the short term, Rs. 1.9 billion would be required for the restoration of the relevant line agencies' buildings and rehabilitation of irrigation facilities. In the medium term support would be needed for replanting fruit trees, rebuilding terraces, replenishment of livestock inventory, rehabilitation of productive infrastructure, and reconstruction of laboratories, offices of extension and research for agriculture, livestock, and irrigation departments. Over the longer term the focus should be on restoring livestock inventories and

rehabilitation of terraces and soil conservation infrastructure that have been severely damaged. It is necessary to reestablish the agricultural sector in a sustainable manner through strengthening institutional capacities and providing support services.

63. **Transport. (a) Damage – Rs. 20.2 billion (US\$340 million).** Damage to the mountainous roads in AJK and NWFP is largely due to landslides precipitated by the earthquake, but the intensity of the damage varies. In AJK, it is estimated that 2,366 km roads were damaged. Of this 203 km are major roads, 761 km are other paved roads, and 182 km are unpaved shingled roads for a total of 1,146 km representing 45 percent of all Public Works Department (PWD)-managed roads. These include the Neelam Valley road, and to a lesser extent the Jehlum Valley road, which are the primary transport arteries in AJK. Another 1,220 km of local unpaved roads are damaged, representing 44 percent of the total Local Government and Rural Development (LGRD) roads in the affected districts. Damage in AJK is estimated at Rs. 9.2 billion (US\$155 million). In NWFP, 2,063 km of roads were damaged, representing 31 percent of the total road network in the affected Districts. Of this amount, 652 km comprise provincial highways managed by FHA, 1,016 km are paved provincial roads that were devolved to the Districts, 367 km are unpaved district roads, and 27 km are urban roads managed by municipal agencies. The estimated damage in NWFP is about Rs. 7.49 billion (US\$124 million).

64. The damaged length of the three national highways that provide main access to the northern areas of NWFP is about 194 km, representing 72 percent of the total length. The estimate of assessed damage to the national highways is Rs. 3.5 billion (US\$59 million).

65. **(b) Recovery needs – Rs. 24.7 billion (US\$416 million).** Immediate needs include: (i) the removal of landslide debris and the reopening of roads to traffic; (ii) restoration of roads and bridges; (iii) stabilization of road embankments to withstand the oncoming snow; (iv) comprehensive condition surveys of all damaged roads to plan and prioritize the reconstruction and recovery works; and (v) reconstruction of unpaved local roads using labor-based appropriate technology methods employing communities and individuals to create livelihood opportunities. Short term activities include: (i) planning and engineering design; (ii) bidding of the priority damaged paved roads; and (iii) mobilizing for construction. A total of Rs. 5.1 billion, or US\$86 million, will be needed for this phase. Medium to longer term recovery efforts include: (i) continuation of the bidding for the remaining damaged paved roads; (ii) supervision and monitoring of the ongoing reconstruction works; (iii) stabilization of the roadside slopes damaged by landslides and potential landslide areas; and (iv) review and improvement of design standards. A total of Rs.19.6 billion, or US\$330 million, will be required for this phase.

66. **Education. (a) Damage – Rs. 19.9 billion (US\$335 million).** About 7,669 schools were affected, ranging from primary schools to institutions of higher education and including both government-owned and privately-owned schools. Approximately 5,690 of the damaged schools are primary and middle schools. About half of the damaged school structures collapsed or are beyond repair and will need to be rebuilt. In addition to damages to educational institutions and offices, the education sector has also experienced severe human losses, including students, school teachers, and staff. According to preliminary estimates, about 18,095 students and 853 teachers and educational staff died across NWFP and AJK. The deaths of teachers represent not only losses to the teaching force, but also a loss of government investment in teacher capacity development through training. A substantial number of teachers, staff, and students may also suffer from emotional trauma and injuries, which could limit their capabilities.

67. **(b) Recovery needs – Rs. 28.1 billion (US\$472 million).** The most urgent requirement of the education system is to resume classes at all levels. This would entail the provision of temporary and semi-permanent alternative learning spaces, the repair of partly damaged schools, the provision of learning materials, the training of teachers to replace those who have perished, and the revival of education administrative structures. These short term measures are estimated to cost Rs. 1.2 billion. Over the medium to long term, destroyed schools will need to be rebuilt. This will involve the construction of

new schools with seismic-resistant strengthening, classrooms, facilities, latrines and water supply, and the provision of learning materials, furniture, and equipment. Partly damaged schools will also need to be repaired, and continued teacher training will be required over the medium term. A substantial number of students in these areas may now have special learning needs that would additionally require new teaching approaches and school design modifications for improved accessibility of the disabled.

68. **Health. (a) Damage – Rs. 7.1 billion (US\$120 million).** The immediate need is to treat the more than 70,000 people with injuries. The earthquake's impact on the health sector also includes severe damage to health infrastructure and health systems. About 574 health facilities have been partially damaged or destroyed. Furthermore, there have been 21 confirmed deaths and 141 injuries sustained to staff, with incomplete information regarding the Lady Health Workers (LHW) residing among the affected communities. Many surviving staff members in the earthquake affected areas are away from work due in part to psychological trauma and to their assistance to family members in finding shelter and rebuilding houses. Moreover, health management was paralyzed at the central level in AJK, district, and at the facility level. These losses have resulted in a complete breakdown of the health system and a total disruption of both secondary and primary care service provision.

69. Based on available information, the total damage to the health sector is estimated at approximately Rs. 7.1 billion. This figure does not include the cost of damage to private health care system and indirect losses due to expenditure on treatment of survivors, public health interventions, loss of health staff and the impact of psychological trauma, which have not been computed.

70. **(b) Recovery needs – Rs. 18 billion (US\$303 million).** The reconstruction and recovery strategy could be carried out in two overlapping phases. In the short term, the most urgent need is to ensure access to an essential health care package that reduces vulnerabilities and saves lives as the system is revitalized. The immediate focus needs to be on the revitalization of the primary health care system, the provision of services in tented villages and for the newly disabled, and psychological care for survivors and health care workers. The estimated short term cost is Rs. 7.2 billion. In the medium term, all levels of health facilities, including secondary care hospitals, will need to be reconstructed and re-equipped. The health system management should be strengthened and the disabled should undergo community-based rehabilitation. The medium term plan should also consider developing and putting into place an epidemiological surveillance, emergency preparedness, and disaster relief system for the health sector. The estimated cost of the medium to longer term recovery plan is Rs. 10.8 billion.

71. **Water Supply and Sanitation. (a) Damage – Rs. 1.2 billion (US\$20 million).** In NWFP, preliminary estimates suggest that as a result of the earthquake, up to 77,500 households could be affected by disruptions to partially damaged or destroyed water supply schemes. In AJK, this number is estimated to be 82,300 households. In both NWFP and AJK, about 80-85 percent of the water supply schemes are gravity based, with the remaining percentage being tube-wells, dug-wells and hand-pumps. Major damage has been reported at the intake of gravity schemes, and to a lesser extent to supply mains due to landslides and to distribution systems due to house/building collapse. The damage to water reservoirs, hand pumps, and tube-well schemes has been reported to be minimal. In rural areas the damages are mainly to the source, intake structures and water mains, and to a much lesser extent to the tertiary networks. Major damage to sanitation is in the form of destroyed household toilets and to a lesser extent to drains and public toilets.

72. **(b) Recovery needs – Rs. 1.9 billion (US\$32 million).** Reconstruction needs for water supply and sanitation include infrastructure replacement and support for implementation. Short term needs, estimated to cost about Rs. 1.15 billion, should focus on: (i) rehabilitation of partially-damaged government and community spring/gravity, dug-well, and hand-pump infrastructure; (ii) rehabilitation of partially-damaged surface water schemes and associated treatment plants; (iii) rehabilitation of communal latrines; (iv) initiation of a solid waste management program for clearing and recovery of debris material,

particularly in urban areas, with designated dumping zoning and disposal practices; and (v) provision of basic buildings for AJK Government staff supporting water and sanitation-related agencies. The medium term needs (Rs. 753 million) and associated strategy should focus on: (i) providing water distribution networks for reconstructed settlements and for selected new settlements resulting from land readjustment and small-scale relocation schemes; (ii) provision of drainage and/or sewerage for reconstructed settlements; (iii) formalization of solid waste management schemes in large towns; (iv) reconstruction of full AJK Government Public Works and Local Government Rural Development Department offices; and (v) upgrading of sector facilities for improved disaster preparedness.

73. **Energy. (a) Damage – Rs. 744 million (US\$13 million).** Damage to the four energy subsectors—power, petroleum and gas sectors, and subsistence fuels (wood and dried dung)—consists primarily of destroyed operational buildings, staff quarters, equipments in the power sector, and damage to retail stations and related inventory in the fuels sector (petroleum, liquefied petroleum gas (LPG), and natural gas). In addition, ten hydropower generation stations have been partially damaged and will require repairs to return to full operational status. The bulk of power and fuel supply was restored within days of the earthquake, and power is being supplied to all accessible urban and rural areas. For the most part, the initial repairs are temporary and will need to be revisited to establish permanent technical and building structures for continuous energy supply.

74. **(b) Recovery needs – Rs. 2.4 billion (US\$40 million).** For the recovery of the energy sector, two immediate priorities include the electrification of the tent villages and restoration of electricity supply to the customers whose services have not yet been restored. In the short-term, the repair and rehabilitation of existing damaged distribution lines, transformers, and service connections is needed. The sufficient provision of electricity must be an integral part of the planning and implementation process to ensure that new service connections are in place to supply power to newly constructed houses. The cost estimates have incorporated technological upgrading of the equipment to ensure improved efficiencies and quality of services, which will benefit the area through increased economic activity. A major additional cost related to the reconstruction of the energy sector is caused by the moratorium on electricity payments. In order to ensure financial sustainability, payment for power and fuels will have to be made to protect the distribution companies and fuel retailers.

75. **Governance and Institutions. (a) Damage – Rs. 3 billion (US\$50 million).** The most severe impact in this sector has been the widespread damage to buildings and equipment, and the trauma associated with loss of life and injury. For example, fifty-five provincial office buildings and 9 (90 percent) district and 249 provincial officers' residences were destroyed. Immediately following the disaster, civil administration in many districts was severely disrupted due to the destruction of administrative complexes and sub-divisional office buildings. Courts were at a standstill, and policing was severely affected. In affected municipalities, about 25 percent of the revenue records and 85 percent of municipal records appear to have been lost, including birth, death, police and judicial records.

76. **(b) Recovery needs – Rs. 4.3 billion (US\$72 million).** This figure encompasses the cost for recovery in the civil administration, judiciary and police sectors.

77. **Industry and Services. (a) Damage – Rs. 8.6 billion (US\$144 million).** Due to the lack of any major industry or manufacturing in the affected areas, the damage to the private sector is largely restricted to trade activities. All eight affected districts have a substantial number of trade-related activities comprising retail, restaurants, and wholesale warehousing. Mansehra district in NWFP, which contains the tourist towns of Kaghan, Naran, and Balakot, also sustained significant damage to its tourism infrastructure. Similarly in Muzaffarabad district in AJK, the handicraft sector was substantially damaged. Direct damage to assets in the private sector comprises building façades of commercial enterprises, which are mainly restricted to retail shops. The capital damage indicates losses to the goods,

inventories, and other working capital. These establishments also suffered indirect losses, which refer to output lost due to business interruption caused by the earthquake.

78. **(b) Recovery needs - Rs. 9.2 billion (US\$155 million).** The reconstruction needs for the trade sector are attributed to the reconstruction of the damaged and destroyed buildings and the replacement of lost capital assets. In the short term, the aim should be to restore the abilities of medium, small-scale and even unregistered businesses to restock basic supplies and to re-engage in commerce, which is central to the livelihoods of people living in affected areas. Restoring basic infrastructure and facilitating access to financial resources—from domestic and foreign remittances, microfinance institutions, and banks—is an essential first step. The Government will have a key role to play in helping entrepreneurs rebuild their businesses quickly and returning commerce to normalcy in the affected regions.

E. APPROACH TO RECONSTRUCTION AND RECOVERY

79. International experience, most recently acquired from reconstruction and recovery efforts in response to the Gujarat earthquake and the 2004 tsunami, demonstrates that while rescue and relief operations can be relatively quick to mobilize, the process of converting financial commitments into effective action is marked by unanticipated delays, unrealized expectations, and denial of rights. Recovery operations perform better when they are aligned with local governing arrangements. Legally mandated and functioning local authorities should not be ignored; experience elsewhere shows that they can be the determining factor in ensuring speedy and appropriate responses.

80. Effective and timely post-disaster rehabilitation and recovery has occurred where the following governance and institutional principles have been observed.

81. **People-centered solutions.** Whenever possible, affected people should receive flexible external support to assess their own needs, make arrangements for shelter, and restore their livelihoods. Special institutional and legal arrangements should be established to protect vulnerable groups such as orphans, women and missing persons from abduction and trafficking. Identities and entitlements must also be protected, and therefore systems must be put in place to secure lost records on revenue, property, death, birth, banking, police, judiciary, and state and community land. Likewise, concerted efforts need to be taken to guarantee civil rights, particularly of vulnerable populations, through the simplification of judicial and administrative procedures and through the provision of legal aid. Civil society should be positively engaged in recovery operations, while recovery for the private sector in service delivery should also be facilitated, minimizing compensatory actions that distort market response. A clear strategy is needed for transition from the relief to recovery phases, from military to civilian control, and from short term executive controls to legally sanctioned, locally elected leadership.

82. **Subsidiarity and restoration of responsibility to legally mandated institutions** is important for speed, relevance, and accountability of recovery operations. While centralizing the strategic planning of the recovery strategy, it is important to return responsibility for all other executive functions to the lowest level of mandated and competent authority. This will enable recovery operations to exploit local knowledge and build local capacity for the restoration of government capacity. The Government will need to announce such commitments and implement protocols for responsibility and reporting at all levels of the recovery operation. Existing coordinative and regulatory arrangements should be exploited in the planning, execution, and accountability of recovery operations.

83. **District and central strategic coordination and accountability** should be accorded high priority. Special purpose district arrangements are needed to facilitate coordination between army and civilian agencies and civil society during restoration of accountability of the local administration to elected representatives. To ensure central and provincial strategic accountability, clear assignment of responsibilities is required at the national and province levels for the following functions: (i) cross

sectoral policy coordination; (ii) multi-agency coordination; (iii) information clearing house on responses; (iv) documenting government and donor commitments; (v) monitoring compliance with agreements; and (vi) advising on inventive revenue raising options. Furthermore, donor engagement should be tailored according to sector features, the scale of the damage, and the donor's comparative advantages and capacity to respond.

84. ***Competing demands need to be managed through technical and policy*** choices that improve the speed of recovery responses. A balance is needed between replacing lost facilities and services where the cost is marginal and efficiency gains clear, and on the other hand, avoiding the replacement of facilities known to be under-serving or inadequate prior to the disaster. Government guidelines regarding eligibility for inclusion in financing and earthquake recovery operations are needed. Service delivery reform should focus on situations where replacement of lost infrastructure is unlikely to impact service access or quality. Where possible, sector responses should favor gender sensitive and environmentally sound repair and rehabilitation over wholesale reconstruction, with due regard to local knowledge and materials.

85. ***Enhance operational capacity to respond by known institutional solutions.*** Umbrella approvals should be sought for multiple standard works and responses that can facilitate larger scale contracting and common protocols for key steps. Because local capacity must be augmented, the Government should make explicit the expected increase in responsibilities and assist with the review of annual development plans, the development of schemes, and the preparation of protocols at the state and district levels. Furthermore, inventive arrangements and the contracting of technical specialists will be needed to strengthen local capacity to meet the responsibilities for planning, budgeting, implementation and quality assurance of recovery operations. Exploiting existing assignments will encourage multiple institutional arrangements through which works and services are currently delivered. Also, whereas market responses should largely be facilitated, selective government direction of the private sector may be justified where market response fails.

86. ***Accountability and enforcement of standards and norms*** requires functioning administrative dispute resolution systems and full extension of supreme audit institutions, backed by functioning judiciary and legal institutions. Campaigns are needed to ensure citizens have access to information about all recovery operations. A common donor, government, and civil society commitment to zero tolerance for corruption must be backed by full extension of the Auditor General of Pakistan's (AGP) jurisdiction to all agencies involved in recovery operations, third party verification of contracts, and use of Pakistan's existing arrangements for community-based social audit.

F. HAZARD RISK MANAGEMENT

87. Pakistan frequently experiences weather-related hazards, resulting in significant economic losses from localized and seasonal floods, landslides and droughts. Large scale earthquakes have resulted in serious life and property losses, such as the 1935 Quetta earthquake and the 8th of October disaster. Seismic risk is high in many parts of Pakistan and may be higher than recognized in densely populated cities such as Karachi, Islamabad and Rawalpindi. Lack of enforcement of building codes, unsafe land use patterns, and poor construction practices contribute to high economic and human losses. Changes in demography and climate, urbanization and unsound construction practices may increase frequency and future losses from disasters, potentially a significant setback to the country's development.

88. At present, Pakistan has an ad hoc approach to hazard risk management. Interventions are primarily focused on relief and response with insufficient ex ante mitigation measures. Flood and drought management has been receiving the most institutional and financial attention due to their socio-economic impact and political importance. Seismic risk reduction is less recognized, hence receives less attention. The National Calamities Act (1958) gives a framework for government response and preparation for

disasters nationwide. The Local Government Ordinance (2001) includes provisions for local administration to develop and enact disaster management and risk mitigation measures. There are systems in place for providing relief following a disaster through the Emergency Relief Cell that coordinates federal response to disasters and administers federal relief funds. In large scale disasters, the army is the main institution with quickly mobilized logistical capacity to respond.

Strategic Approach to Hazard Risk Management

89. In light of the devastation caused by the 2005 earthquake, it is important to take into account some of the factors that may have exacerbated the damage in affected areas. The following critical issues comprise five pillars that elaborate a comprehensive hazard risk management approach: risk identification, emergency preparedness and response, risk reduction, capacity building, and risk transfer. This approach should be reflected in the design and implementation of the recovery strategy, as existing vulnerabilities to natural hazards should be mitigated as much as possible.

Pillar I: Risk Identification

90. ***Seismic hazard analysis.*** Seismotectonic considerations indicate that similar or larger events in the same or neighboring regions are possible. A seismological monitoring network exists but is in need of modernization. Efforts to undertake a new seismic risk analysis of Pakistan should also be intensified.

91. ***Multi-hazard risk assessment and mapping.*** An integrated assessment of the potential impact of multiple hazards on people, infrastructure and economy is good practice. The potential losses from disasters should inform national development plans. Assessments of risks of the affected areas should inform reconstruction decisions and further nationwide, multi-hazard risk mapping should feed into future development plans.

Pillar II: Emergency Preparedness and Response

92. ***National level.*** A national disaster management strategy, which builds upon existing entities and mechanisms already in place, should be devised and implemented. Channels to improve coordination between the national entities and local administration should be explored.

93. ***Local level.*** After the disaster, communities themselves were the first responders and local administration continues to be the coordinator of activities on the ground. Communities, local authorities and NGO community should be encouraged and trained to cooperate and be better prepared.

Pillar III: Investment in Risk Reduction

94. ***Reducing risks in post-earthquake reconstruction.*** Post-earthquake reconstruction is a major investment. The GoP should take this opportunity to protect the reconstruction of public and private buildings and infrastructure from various types of hazards. Lessons learned from the damage should be fed into reconstruction planning and future risks reduced through improved building standards and design considerations.

95. ***Protection of public infrastructure.*** A significant amount of public infrastructure was severely damaged by the earthquake. Safety of public buildings such as schools and hospitals is particularly important, and their reconstruction should incorporate improved building standards to reduce their risk of future collapse or damage in the event of a subsequent disaster. It is recommended that the Government create an entity with the requisite technical capacity and mandate to review and approve the designs for public buildings in order to ensure that seismically appropriate standards are applied.

96. **Land use.** Site conditions appear to have influenced the level of damage. Landslides occurred on steep slopes. Settlements such as Muzaffarabad and Balakot built on flood plain deposits of alluvial soil received amplified impact from the earthquake. Building design and land use decisions both in the reconstruction phase and in urban development plans need to integrate identification of potentially risky areas into planning decisions.

97. **Legislation and standards for future safety.** Building collapse was due to their very poor quality of construction and lack of seismic consideration in their design. The primary lesson to be learned is that new buildings need to be seismically designed and built to a higher quality standard. Compliance with regulations and codes needs to be better enforced.

98. **Retrofitting.** During the reconstruction phase, repair of both damaged and vulnerable buildings needs to include seismic strengthening. Buildings in Pakistan are generally vulnerable to earthquakes; therefore, the feasibility of a national seismic retrofitting program should be examined, beginning on a priority basis with schools and hospitals.

Pillar IV: Capacity Building

99. **Institutional capacity building and coordination.** The lessons and experiences of current relief and recovery coordination should be distilled in developing an appropriate disaster management mechanism and authority, as well as a national plan that clarifies roles and responsibilities and strengthens coordination among different government agencies.

100. **Education and training.** Systematic training for disaster management should be improved in Pakistan. Professional education and civil servant training could greatly improve risk management in the country. Primary and secondary school textbooks should also raise awareness of risks as part of the education curriculum. Basic training of contractors and builders on safety measures for construction should also be considered as part of the reconstruction process.

101. **Public awareness-raising.** A major public awareness campaign on risks, preparedness, and vulnerability reduction should be implemented as soon as possible. Information dissemination programs would greatly improve people's understanding of existing natural risks and how to mitigate their impacts.

Pillar V: Mechanisms for Risk Transfer and Financing

102. Risk transfer through insurance allows for the burden of reconstruction to be shared among public and private actors and protects valuable resources. In Pakistan, insurance penetration is limited. The Government could provide a regulatory role and review the existing framework for the insurance sector within Pakistan. It could also allow space for the private sector to develop private insurance basis, or the Government could choose to invest in purchasing insurance for its own assets to prevent future losses caused by disaster impacts. The feasibility of tailoring an insurance package to the poor that addresses their main post-disaster risks, as well as Government investment in ex ante risk reduction measures for protection of public assets, should be investigated.

103. **Mitigating the social and economic impacts of future disasters.** While the recent earthquake was a tragic event and the immediate focus should be on response and recovery, it should be borne in mind that Pakistan will suffer from future earthquakes. In fact, Pakistan has very substantial seismic hazard, so that parts of the response and recovery program should be developed bearing in mind future earthquakes and how the current response and recovery experience can be usefully employed in other parts of Pakistan.

104. In many parts of the world, major earthquakes tend to occur in cycles in which stress builds up in tectonic plates over decades to centuries, which results in increasing seismicity culminating in a large earthquake. Available evidence indicates the Himalayas follow this pattern. The October 8, 2005 earthquake occurred in a region “where a great plate-boundary earthquake has long been considered overdue”,⁶ resulting in only about 25 percent of the energy of the potential great plate-boundary earthquake being released. Release of the remainder of the energy would require a magnitude 7.9 event. The potential exists for the same area affected by the October 8 event, to be affected by a larger earthquake. Beyond the Kashmir seismicity, Quetta and Karachi also have serious seismic risk.

105. Consequently, building and reconstruction in the area damaged by the recent earthquake should occur in conformance with modern seismic codes and good construction practices. Beyond the affected region, older buildings will be removed by attrition over the next several decades, but seismic retrofitting of selected facilities (schools, hospitals, etc), upgrading of construction quality, research and development of earthquake engineering capacity, risk based planning of investments and other actions are required which, combined, form an integrated national earthquake risk reduction program. This earthquake risk reduction program would actually be a key component of a broader multihazard risk reduction strategy, as discussed above.

⁶ Bilham R and K Wallace, (2005), Future Mw>8 earthquakes in the Himalaya: implications from the 26 Dec 2004 Mw=9.0 earthquake on India's eastern plate margin, *Geol. Surv. India Spl. Pub.* 85, 1-14.

ANNEX 1– ECONOMIC ASSESSMENT

A. Introduction

1. This annex assesses the economic impact of the earthquake on Pakistan's economy. The damage from the earthquake is measured using the UN ECLAC Macro-Economic Assessment Methodology, which estimates the value of destroyed physical assets (direct damages), the disruption in the flow of production of goods and services (indirect losses) and the cost of rebuilding the lost assets (reconstruction costs). The annex also estimates the effects of the earthquake on economic growth, and discusses possible impact on public finances, the external sector and inflation.

2. In conducting the assessment, the team worked closely with the Government of Pakistan (GoP), the Governments of North West Frontier Province (NWFP) and Azad Jammu and Kashmir (AJK), and consulted non-government agencies, the broader international donor community, and the private sector. This assessment uses primary and secondary sources of data, including official survey data such as the PIHS, LFS, National Population Census, 1998 Agriculture Census and Livestock Census, NWFP Development Statistics 2004, and AJK at a Glance 2004. Data on damages were verified, to the extent possible, through visits to the affected areas by World Bank and ADB staff and by local experts and international experts.

3. Preparing a timely economic assessment is critical to successfully launch the recovery and reconstruction of the earthquake-affected areas. This assessment presents the best available estimate of the direct damages, indirect losses and reconstruction costs as of the date of this report. The absence of national income data at provincial and district levels and the lack of up-to-date and comparable information about the affected areas pose an additional challenge in undertaking this exercise. In the coming weeks, the analysis is likely to be refined, as more precise information of the destruction of the earthquake becomes available. Moreover, the overall impact of the earthquake would be influenced by the recovery strategy, pace of implementation, stakeholders' responsiveness, and the level and type of financing mobilized by GoP in the coming months.

B. Socio-Economic Conditions in the Affected Areas: A Pre-Earthquake Profile

4. The earthquake was centered on the northern areas of Pakistan, affecting a vast area of land stretching from the bordering areas of Afghanistan on the west to parts of Indian Kashmir in the east (see Figure 1). Much of the damage to assets and livelihoods took place in Pakistan and was most severe in eight districts in two regions, namely Abbottabad, Batagram, Kohistan, Mansehra and Shangla in NWFP and Muzaffarabad, Bagh and Poonch in AJK. The affected area is poor, and households rely mostly on agriculture and livestock, small-scale commerce, and remittances to earn a living.

5. In terms of geographical area, population and socio-economic infrastructure, the affected districts in NWFP are many times

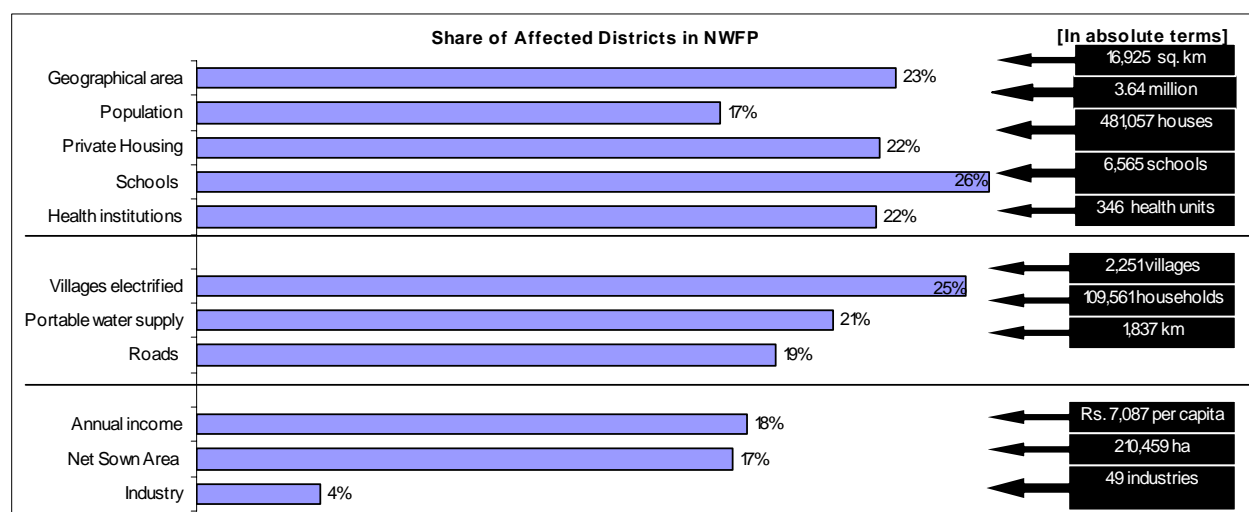
Figure 1: Areas Most Affected by the Earthquake



larger than in the ones in AJK. However, relative to the size of their respective regions, the affected districts account for a much larger share of economic activities in AJK than in NWFP.

6. In NWFP, the five affected districts account for nearly a quarter (16,925 km²) of the province's geographical area and 17 percent (3.6 million) of its population. The share of the affected districts in the social and physical infrastructure in the province is found to be higher than their share in population. This is due to lower population density and more scattered settlements in the affected districts than the rest of NWFP and AJK (see Figure 2). For example, the affected districts account for 22 percent of the stock of private housing, 26 percent of schools, 22 percent of health institutions, 25 percent of villages with electricity, 21 percent of households with potable water and 19 percent of the road network, while only 17 percent of the province's population resides there. Annual per capita income in these districts is similar to that of the rest of the province. Outward migration and corresponding remittances are defining characteristics of these districts. In 2001/02, nearly 53 percent of the households in the affected districts received remittances from migrant family members, compared to 37 percent of households in the entire province. Most of these remittances originate from other urban centers in Pakistan and, for some households, from abroad. Thus, per capita consumer expenditure in these districts tends to be significantly higher than what their per capita income (at factor cost) would suggest.

Figure 2: Selected Socio-Economic Indicators for Affected Districts in NWFP
(in absolute terms as well as relative to the rest of the Province)



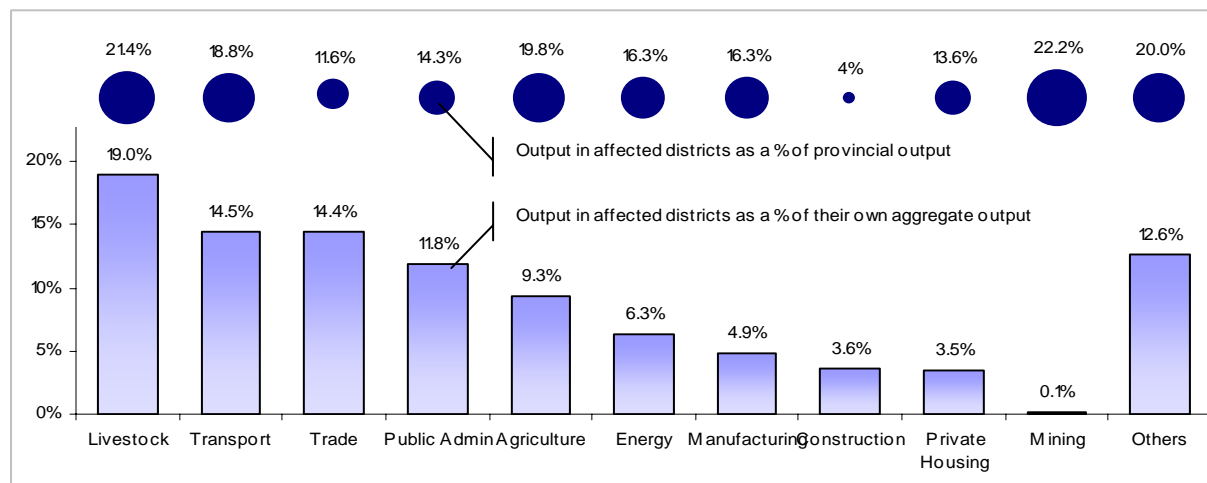
Source: World Bank staff estimates.

7. The affected districts in AJK account for 63 percent of its geographical area (which is equal to 8,340 km²) and 52 percent of its population (1.8 million). Over half of AJK's private housing (51 percent of the stock of houses), schools (54 percent), health institutions (51 percent), road networks (54 percent), and a significant share of households with potable water (43 percent) and electricity connections (19 percent) are located in these three districts. Like NWFP, the affected districts of AJK are large recipients of remittances, although, the percent of households receiving remittances is considerably higher in AJK than in NWFP. At the same time, the source of remittances in AJK is more diversified than in NWFP, with foreign remittances accounting for more than 50 percent of total remittances.

8. In order to assess the potential economic losses arising from the earthquake, it is necessary to have a first order approximation of the economic structure and output of the affected districts (Box 1). As shown in Figure 3, the five most critical sectors in the affected districts of NWFP in terms of output are: livestock (19 percent of affected districts' output), transport (14.5 percent), trade (14.4 percent), public administration (11.8 percent) and crop agriculture (9.3 percent). The high share of agriculture and services and the low share of manufacturing in total output are consistent with the feedback received from

policymakers and researchers familiar with the local economy of the affected districts. The share of the affected districts in NWFP in total output varies between 15 and 20 percent across most sectors. The total output generated in the five NWFP districts in 2004/05 is estimated to be \$1.5 billion (equal to 1.4 percent of national output).

Figure 3: NWFP- Rough Estimates of Output in Affected Districts 2004/05
(as a percentage of their own output as well as share of provincial output)



Source: World Bank staff estimates.

Box 1: Assumptions Underlying the Output Estimates of Affected Districts

The estimation of output at the district level is not a straightforward exercise since national income accounts are not prepared at provincial and district levels in Pakistan. However, the World Bank in consultation with the GoNWFP has recently put together estimates of provincial GDP (PGDP) for NWFP, which form the basis for estimating output (value added) at the district level in the province.

For each sub-sector, multiple indicators are used to estimate the share of individual districts in the province and a geometric mean of various shares of these indicators is used to compute a composite share (CS) for each district and for each sector. The district GDP (DGDP) for a sub-sector is thus assumed to be the equal to the CS of the PGDP. For example, in case of crop agriculture, the share of the value of production and employment in agriculture is used to estimate the CS for individual districts and the CS times the PGDP is equal to the DGDP. The numbers are then corroborated with the information available on the ground and are checked for consistency by economists and policymakers who are familiar with the economy of the affected region.

Since national accounts data are not available for AJK, computing its district level output is more complicated and less accurate than for NWFP. The assessment team resorted to the assumption that the return to factors in the affected districts in AJK are similar to that of NWFP, which is not an unrealistic assumption, given the similarities in the terrain and topography of the entire affected areas. For example, it is assumed that the value added by a livestock in affected districts of AJK is the same as in the affected districts of NWFP.

9. The affected districts of AJK account for as much as 52 percent of the total output generated in the State, with three sectors—livestock, trade and public administration—accounting for nearly 55 percent of it. Consultations with local policymakers during the field visits reconfirmed the importance of these sectors for sustaining growth and livelihood of the affected districts. The total output generated in the three affected districts of AJK in 2004/05 is estimated to be \$0.8 billion (or 0.75 percent of output of the four provinces and AJK).⁷

⁷ The GDP of AJK is not included in Pakistan's GDP. In this assessment, estimated AJK's GDP is added to the GDP of the four provinces to calculate the overall output of the economy.

C. Preliminary Estimates

Concepts and Methodology

10. The economic impact of the earthquake includes the following three costs: (i) Direct Damage; (ii) Indirect Losses; and (iii) Reconstruction Costs. *Direct Damage* refers to the monetary value of the completely or partially destroyed assets, such as social, physical and economic infrastructure (including final goods, goods in transit or process, raw materials, materials and spare parts), immediately following an earthquake. Wherever possible, the direct damage for assets is assessed in “as was” condition, i.e. at their book values (see Box 2). *Indirect Losses* 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 the lost assets and restoring the lost services. It is generally assessed at the replacement cost, and in the case of this report, it is defined to include the additional cost to be incurred for earthquake resistance.

11. The exact methodology used in computing the direct damage and reconstruction cost for individual sectors is described in details in Box-2. Indirect losses are estimated using a constant return to scale production function with capital and labor as two factors of production. The loss in capital and labor for each sector is obtained from the sectoral annex and the livelihood annex respectively. Assuming the share of capital and labor to be 35 and 65 percent respectively of the total output, the change in output between the pre- and post-quake period is estimated. If additional information about increased expenses and diminished revenues is available, it is added to the output loss to estimate the indirect loss arising due to the earthquake. Table 1 summarizes the direct damage, indirect losses and reconstruction costs for each sector; sectoral details are presented in the subsequent annexes of this report.

Direct Damage

12. Preliminary estimates of the direct damage sustained due to the earthquake total Rs. 135,146 billion (US\$2.3 billion), as presented below in Table 1. The largest component of this damage is to private housing, which amounts to Rs. 61.2 billion (US\$1 billion), followed by damage to the transport sector totaling Rs. 20.2 billion (US\$340 million), and to the education sector equaling Rs. 19.9 billion (US\$335 million). Direct damage to agriculture and livestock is also sizeable, totaling Rs. 12.9 billion (US\$218 million). The losses to industry and services amount to Rs. 8.6 billion (US\$144 million).⁸

13. The level of direct damage is higher in AJK than in NWFP. For AJK, it amounts to Rs. 76.4 billion (US\$1.3 billion) and for NWFP, Rs. 56.4 billion (US\$950 million). In most sectors, the destruction of physical assets in AJK is higher than in NWFP, as is its monetary value.

⁸ The direct damage to services and industry includes destruction of physical assets in wholesale and retail trade, hotels and restaurants and banking sector. Damage to private sector health organizations is not included.

Table 1: Preliminary Estimate of Total Losses and Reconstruction Costs as of November 10, 2005

Sector	Direct Damage (Rs. mill.)	Indirect Losses (Rs. mill.)	Reconstruction Costs* (Rs. mill.)	Reconstruction Costs* (US\$ mill.)	Share of Total Reconst. Costs (%)
1. Social Infrastructure					
Private Housing**	61,220	7,218	92,160	1552	44
Health	7,114	1,378	18,012	303	9
Education	19,920	4,133	28,057	472	13
Environment	12		8,985	151	4
Public administration	2,971	687	4,254	72	2
2. Physical Infrastructure					
Transport***	20,165	4,061	24,699	416	12
Water Supply and Sanitation	1,165		1,900	32	1
Irrigation	324		623	10	0
Energy, power and fuel	744	1,561	2,377	40	1
3. Economic Sectors****					
Agriculture and livestock	12,933	6,770	17,846	300	9
Industry and Services	8,578	8,379	9,178	155	4
4. Total = 1+2+3 (in Rs. million)					
	135,146	34,187	208,091	3,503	100
o/w : Azad Jammu and Kashmir	76,375	17,671	116,625	1,963	56
: North West Frontier Province	56,436	16,516	91,467	1,540	44
o/w : Public Assets	45,795	12,175	82,187	1,384	39
: Private Assets	87,015	22,012	125,904	2,120	61
o/w : Urban Areas	25,789	13,675	46,163	777	22
: Rural Areas	107,021	20,512	161,928	2,726	78

Notes: * Cost of reconstruction includes both immovable and movable assets and restoration of public services.

** Includes value of household contents such as consumer durables; reconstruction costs exclude replacement of these assets.

*** Includes roads, bridges, air transport (if any).

**** Total losses and reconstruction costs in agriculture, industry and services are over and above what is accounted by the sectors listed above.

Indirect Losses

14. The indirect losses resulting from the direct damage estimated above are Rs. 34.2 bln (US\$576 million). In the economic sectors, output losses are about as high in the agriculture and livestock sector as they are in the industry and services sector. The indirect losses are comparable in absolute values between NWFP and AJK.

15. The estimated indirect losses do not take into account the effect of rehabilitation and reconstruction activities on future output. Reconstruction will lead to not only restoration of physical assets, but also of flows of production of goods and services. Hence, for output losses, the indirect losses presented above are likely to represent an upper bound.

Reconstruction Costs

16. The cost of reconstruction of public and private assets and the restoration of public services is estimated to be Rs. 208.1 billion (US\$3.5 billion). The reconstruction costs are valued at an improved standard replacement rate including the cost of rebuilding to earthquake resistance standards in a manner suitable to local conditions. This is necessary given the high degree of exposure to natural disasters in the affected area.

Box 2: Damage Valuation Criteria and Estimation Procedure

Following the UN prescribed methodology, direct damages are valued at the *book value*, or the depreciated value of the lost assets. This involves estimating the value of the lost or damaged asset in its pre-disaster condition, taking its age into account in order to arrive at the value of its remaining useful life. In this report, the book value criterion is used only to value the immovable assets, i.e., damaged buildings. The movable assets like goods, furniture, machineries and inventories lost during the earthquake are valued at the *replacement cost* with the same characteristics as its original or improved design and without deducting the asset's depreciation over its useful life. Reconstruction cost is valued at the *replacement cost with earthquake proofing elements*. This involves the cost of replacing the asset at the current price plus the cost of making the asset more resistant to impact of future disasters including earthquakes.

To keep the estimation procedure simple, three broad assumptions have been made: (i) all buildings built on or prior to 1970 are valued at 1970's book value; (ii) taking into account the cost of construction in the affected areas and international experience, the cost escalation factor to make an asset earthquake resistant is assumed to be 5 percent of the asset's current replacement cost; and (iii) the repair cost of a partially damaged building is assumed to be 20 percent of its current replacement cost.

The steps involved in estimating the direct damages and reconstruction costs are as follows. First, the extent of physical damage to the assets is ascertained (e.g., number of schools or hospitals damaged). Second, the physical damages are converted into monetary units by using an appropriate valuation criterion and assuming certain unit value of construction. The unit values or price lists are obtained from government, previous World Bank/ADB projects or other reliable price indices available in Pakistan.

D. Macroeconomic Effects

Overall Effects

17. The earthquake caused extensive loss of life and physical damage. Immediate efforts focused on rescue operations and the humanitarian needs of survivors. Beyond the unquantifiable human cost and in addition to relief costs, this preliminary assessment places the cost of reconstruction at \$3.5 billion, or nearly 4 percent of Pakistan's 2004/05 GDP. Part of these reconstruction costs will fall on the private sector and households. However, the major share of reconstruction costs will fall on the Government of Pakistan for two main reasons. First, there is widespread destruction of public social and physical infrastructure in the affected area, which will have to be rebuilt with Government funds. Public expenditures on rebuilding these assets and services are projected at US\$1.5 billion. Second, households in the affected areas are poor, and will require government assistance to rebuild their livelihoods and homes. The level of this public assistance to households will be assessed by the Government of Pakistan, taking into consideration criteria of affordability and consistency with macroeconomic stability.

18. The earthquake will have an adverse impact on the economy, most notably on the fiscal deficit of the Government of Pakistan. In the absence of any offsetting revenue increases and expenditure reductions, fiscal deficits during FY06-08 year could increase by as much as 0.6 to one percent of GDP per year. However, the Government has already stated that, in view of the emergency created by the earthquake, it would be revisiting overall expenditure levels and composition, and would be implementing measures to enhance own revenue mobilization. The Governments of NWFP and AJK's budget will be unable to accommodate a significant share of the relief and reconstruction expenditure, although it would be expected and desirable that they would have significant role in reconstruction.

19. The impact of the earthquake on Pakistan's official GDP (which excludes GDP from AJK) is expected to be relatively small, in the order of 0.4 percent. FY06 GDP growth was projected in June at 7 percent, however, recent data on the outcome of the cotton and sugarcane suggests that growth will be around 6.5 percent. The additional impact of the earthquake is likely to bring output growth further

down, to around 6.1 percent.⁹ This loss is due to a projected reduction in NWFP output for FY06. In addition, the output loss in AJK could amount to Rs. 76.4 billion (US\$297 million), or 27 percent of AJK's 2004-05 output. As reconstruction activity starts, the impact on GDP growth could actually be positive, and will be felt mostly in FY07 and F08.

20. The earthquake has now created additional expenditure needs for relief, reconstruction, and rehabilitation costs. These pressures could pose difficulties for Pakistan's macroeconomic balances and may undermine the achievement of its long-term development goals, unless additional concessional financing is made available by the international community. A key element of the Pakistan's PRSP is the utilization of the additional fiscal space created by prudent fiscal policy and aid to meet development and poverty alleviation objectives. It is, therefore, important that priority public expenditures be protected, so that Pakistan can continue to improve service delivery of health, education, and public infrastructure. The Government has indicated that it would be prepared to absorb a part of the budgetary impact of the earthquake by making cuts in low-priority expenditures and raising additional domestic revenue. These adjustments would be needed irrespective of the amount and type of financing that the donor community would provide. However, given the magnitude of resources for rehabilitation of the affected areas, it is unlikely that the government will be able to fully absorb the fiscal impact of the earthquake without significantly affecting public sector development activities.

21. There have been pressures on the external sector arising from strong aggregate demand and factors not directly related to the earthquake. The earthquake may cause an increase (albeit limited) in imports of fuel, food, and construction materials. A delay in aid inflows to finance GoP earthquake expenditures would aggravate pressures on the balance of payments.

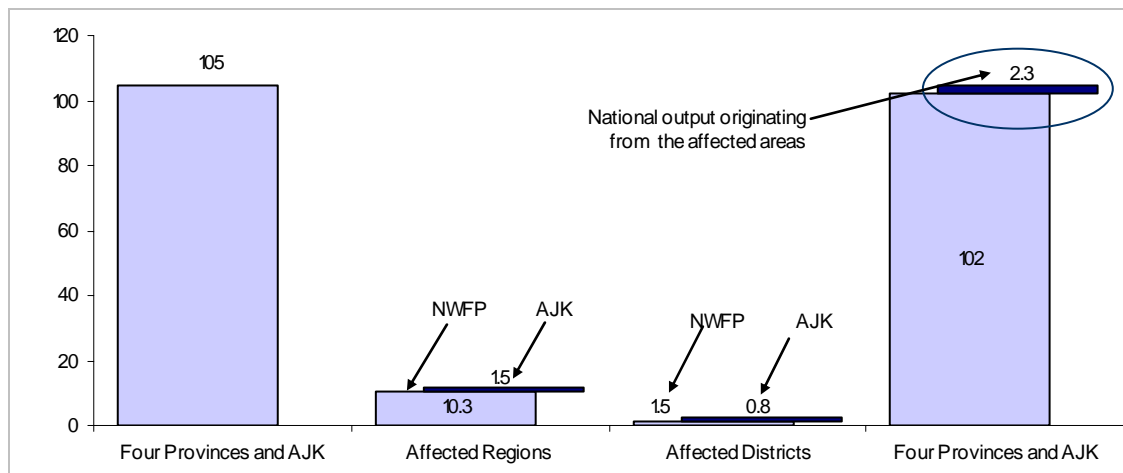
Real Sector

22. Pakistan's economy has undergone a rapid recovery in the last five years, after a decade of political instability, macroeconomic crisis, and limited economic and social progress. Pakistan is now one of the fastest-growing economies in Asia. This remarkable turnaround in the economy has been triggered by an ambitious program of economic reforms and institutional strengthening, which has gathered pace in recent years. For a third consecutive year, output has grown strongly, with GDP growth of 8.4 percent for the fiscal year ending in June 2005. Strong domestic demand has boosted industrial growth in the automobiles, fertilizer, and consumer durable sub-sectors. The agricultural sector has grown by 7.5 percent in the fiscal year ending 2005, and it has been driven by bumper cotton and wheat crops. The services sector grew on average 7.9 percent in the same period. Exports have expanded at a higher rate than output. Private sector response to these developments has been impressive, and is seen in the rapid take up of excess capacity in manufacturing, acceleration of exports, and substantial investment in textiles, banking, and telecommunications.

23. Over the short-run, the growth momentum is unlikely to be significantly influenced by the earthquake as the affected regions account for a very small part of the country's GDP. As shown in Figure 3, the two affected regions, NWFP and AJK, account for only 10.3 and 1.5 percent of national output. The affected districts in NWFP and AJK account for a small share of national GDP, i.e. 1.5 and 0.8 percent, respectively. As only a part of the output in these districts is likely to be lost due to the earthquake in the foreseeable future, the overall impact of the disaster on GDP growth is likely to be small. Over the medium-term, a second-round effect can be expected as soon as reconstruction activities start, and will translate into a stimulus to economic growth.

Figure 3: Output Originating from the Affected Regions and Districts, billions of \$US

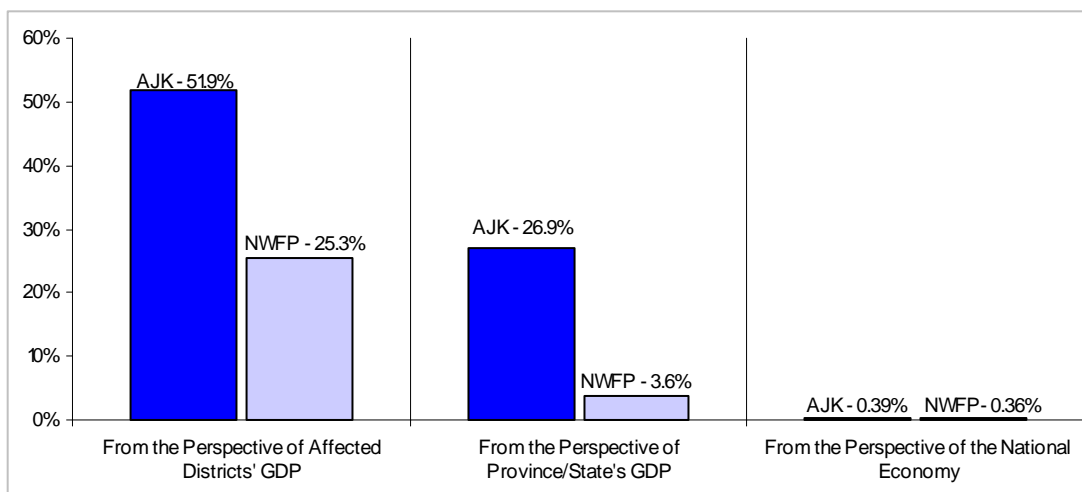
⁹ This assumes that all of the income loss will fall in Fiscal Year 2005/06, an assumption that may overstate the impact of the earthquake on growth.



Source: World Bank staff estimate.

24. While the affected areas will experience a significant dip in output, the impact on output at the provincial/state and national level will not be large. Growth at the national level is expected to decline by 0.4 percentage points in 2005/06.¹⁰ At the sub-national level, output losses in the affected areas most severely hit by the earthquake is estimated to account for 3.6 percent of the province’s output in NWFP and 27 percent in AJK. Within the affected districts, output losses in AJK are severe, accounting for 52 percent of GDP of the state, and moderate in NWFP, where 25 percent of output is likely to be lost due to the earthquake (see Figure 4)

Figure 4: Output Losses at the National and Sub-national Level



Source: WB Estimates.

¹⁰ Loss in output is derived by estimating the labor and capital input losses using a stylized Cobb-Douglas production function.

Effects on the External Sector

25. Pakistan's trade balance is projected to deteriorate over the coming year. Although exports have performed better than expected, imports grew nearly twice as fast as exports, and as a result, the trade deficit has widened. This has been only partly offset by higher-than-projected remittances. The earthquake may affect export performance negatively, should migrant workers from the earthquake affected areas employed in textile and other export-oriented firms not return to their place of work. The other potential impact on exports could arise from a diversion of cement exports away from Afghanistan once reconstruction begins. But the overall impact on exports should be limited, and exports are projected to continue growing rapidly throughout the year. The more significant pressure on the balance of payments comes from import demand, which was already very strong before the earthquake. Relief and reconstruction needs will have some additional impact on import demand, due to higher demand for fuel and steel. This, in addition to the strong import growth arising from an overheating economy, will place an additional strain on reserves.

26. There could be some impact on the current account. Although both remittances and foreign direct investment have shown healthy increases during the first three months of the current fiscal year, during July-September 2005, gross official reserves have declined by \$0.5 billion, to \$9.5 billion. To help the Government meet immediate needs, the World Bank made available US\$200 million of quick disbursing highly-concessional credits. Even with this immediate assistance, a significant financing gap will remain in the balance of payments.

27. In the absence of additional international assistance, and of much needed actions by the authorities to curb aggregate demand, additional funds raised by the government in international capital markets would be insufficient to finance the current account and keep reserves at a level of at least 3-4 months of imports.

Effects on Inflation

28. There have been localized spikes in commodity prices in the areas affected by the earthquake. These are expected to decline over the next few months. Once reconstruction starts, there will be further pressures on inflation, as the recovery will further contribute to aggregate demand. Hence, there will be a need for a monetary policy geared towards containing inflation, in the absence of which average inflation in FY06 could reach double digits, hurting the poor disproportionately.

ANNEX 2 – LIVELIHOOD

A. Introduction

1. This Annex assesses livelihood losses using the pre-earthquake profile of the affected areas—in terms of employment and sources of income—as a benchmark. The estimates of damages are based on a combination of insights from field visits, interviews with government officials and affected communities, and early data collected from the affected areas. The information that is available and quantifiable so far suggests that a livelihood strategy will require a combination of short-term mitigation efforts to weather the immediate shock to incomes and a long-term plan geared towards rehabilitation of sectors that generate employment.

2. The assessment of losses has been informed by a range of consultations, including federal, provincial and district government officials dealing with the rescue and relief efforts, NGOs working in the affected areas, international aid agencies engaged in relief, and individuals from affected communities. Site visits were conducted in Muzaffarabad and surrounding rural areas in Azad Jammu and Kashmir (AJK); in addition, all the affected districts were visited by the early data collection teams.

B. Damage Overview and Recovery Needs

3. In order to arrive at preliminary estimates of losses to livelihood, it is necessary to establish baselines on employment and sources of income in affected districts. The baselines are derived from the Population Census of 1998, and corroborated by evidence from household surveys (Pakistan Integrated Household Survey/PIHS), where applicable. Estimates of losses are derived from early government reports and the data collection efforts mentioned above.

Pre-earthquake Profile of Affected Areas

4. **Employment patterns across sectors and occupations.** The estimated total employment in the affected districts of the two provinces is 1.12 million.¹¹ This estimate was derived from district-specific employment figures published in the District Census Reports of the Population Census of 1998, and *adjusted upwards* to account for: population growth since 1998 and female labor force participation (significantly under-reported by the Census), using PIHS (2001-02) as a reference. The estimate includes self-employment and paid employment of all individuals of age 10 and above, but

	AJK		NWFP	
	No. of employed	% of total empl	No. of employed	% of total empl
Agriculture & Forestry	117,672	33.6	359,110	46.6
Mining	51	0.0	2,933	0.4
Manufacturing	16,200	4.6	14,515	1.9
Utility	1,222	0.3	6,050	0.8
Construction	39,506	11.3	73,292	9.5
Trade	29,350	8.4	59,482	7.7
Transport etc	12,722	3.6	40,590	5.3
Finance & Business	1,487	0.4	3,752	0.5
Services & Public Adm	123,156	35.2	188,876	24.5
Others	8,330	2.4	22,406	2.9
Total Employed	349,697	100	771,005	100

Source: District Census Reports (1998) for relevant districts. The numbers have been adjusted upwards from 1998, at the rate of average population growth for Pakistan between the 1998 and 2005.

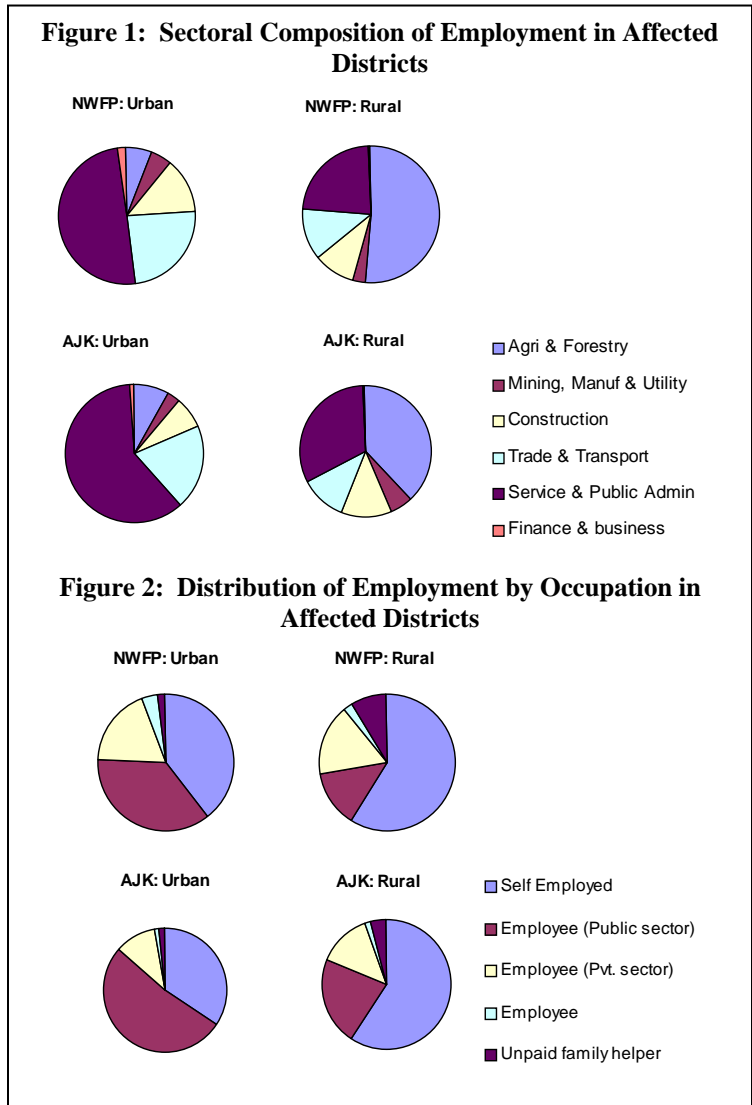
¹¹ Note that this is the *total employment of the 8 districts* affected by the earthquake. However, for most of these districts, not all areas were affected or equally affected by the earthquake, which makes this number only a rough estimate of employment in earthquake affected areas.

excludes employment of migrant workers in regions *outside* the affected districts – following the definitions adhered to by the Population Census.

5. In rural areas of both provinces, agriculture (including livestock rearing) is the primary source of employment. In the three affected districts of AJK, according to the Census of 1998, agriculture accounted for 37 percent of total *rural* employment, while its share was 49 percent for affected areas of rural NWFP (Figures 1 and 2). Services and public administration account for 60 percent of employment in the affected *urban* areas of AJK; small trading and businesses account for 14 percent, and construction and transport together account for 13 percent. Public administration, trade and small businesses, followed by construction and transport, are also the most significant sectors of employment for the affected *urban* areas of NWFP (Figure 1). Overall, employment in public administration is more prominent in AJK than in NWFP, and agriculture is conversely more important in terms of employment in NWFP than AJK (Table 1).

6. The employment patterns by occupational categories are broadly consistent with the sectoral compositions. Self-employed individuals, largely comprising owner-cultivators and shop owners/small traders, account for the largest share of employment (above 50 percent) in both provinces. Employment in the public sector is the second most important occupation in the affected areas, and its shares match well with the sectoral shares of “services and public administration”. Self-employment accounts for almost 60 percent of employment in rural areas of both provinces, reflecting the importance of agriculture and livestock-rearing, while paid employment in private and public sector dominates employment in urban areas (Figure 2). As expected, public sector employees account for a higher share of urban employment in affected districts of AJK than in NWFP.

7. Notably, manufacturing, utilities, mining and finance account for a very small proportion of pre-earthquake employment in the affected districts – less than 5 percent in both provinces. This, along with the low ratio of private sector employees to total employment, indicates that the formal private sector had a limited role in providing employment and incomes in these areas even before the earthquake, and was dwarfed by the public sector in the urban areas of AJK. This would also imply that the brunt of the loss to livelihoods due to the disaster would be borne by the informal sector, comprising of small traders, businesses and households engaged in livestock-rearing.



8. Participation of women in the labor force is low in the affected areas of both provinces (around 17 percent of women of age 10 and above). Among those working, between 40 percent (NWFP) to 50 percent (AJK) are employed in the public sector; agriculture accounts for between 22 percent (AJK) and 40 percent (NWFP) of women employed. The employment estimates, however, are *likely* to understate productive activities of women, particularly in home-based activities.

9. **Variations by agro-ecological zones.** The damage suffered by livelihood from agriculture is likely to vary across different zones even within the earthquake-affected rural areas. For example, in AJK, the affected rural areas can be sub-divided into two broad agro-ecological zones (AEZs): AEZ 1 or Northern Mountain Zone and AEZ 2 or Central Highland Zone. Even within an AEZ, there is much variation in cropping and livestock ownership patterns by altitude, with households at higher altitudes likely to be engaged primarily in subsistence farming and livestock rearing. These variations suggest that the types of losses in livelihood in the agricultural sector are likely to vary by geographical location even within a district, as well as by altitude. For example, for the large number of subsistence farmers in high altitude areas, the loss of a buffalo or a cow can amount to a complete loss of a productive asset that is costly to replace. On the other hand, in higher-altitude areas of AEZ2 where double-cropping is the norm, there is a need for fast turn-around in planting wheat after maize is harvested, and the disaster is likely to have an impact on the capacity to do so in the short window of time that is available.

10. **Migration and remittances.** An important feature of the affected districts is remittances, sent by household members who migrate to other parts of Pakistan as well as to other countries. The high incidence of migration of male household members is apparent from statistics on remittances received.

More than half of households in the affected districts of NWFP received remittances from domestic sources according to PIHS (1998-99), while the incidence of foreign remittances was almost negligible. Remittances amounted to around 29 percent of household consumption expenditure. Remittances are even higher in AJK, with 68 percent of households receiving remittances (including 25 percent who receive foreign remittances), which amount to 34 percent of total household consumption. To put these numbers into perspective, less than 17 percent of households in Pakistan receive remittances. Remittances are as important for the poor, amounting to about a quarter of the household's consumption expenditure even for the poorest quintiles in AJK and NWFP. International remittances appear to be more skewed towards higher quintiles than domestic remittances (see Table 2).

Table 2: Remittances Received by Households

<i>Quin -tile</i>	<i>Proportion of households receiving remittances (%)</i>					
	<i>AJK (all districts)</i>			<i>NWFP (affected districts)</i>		
	<i>Any</i>	<i>Domestic</i>	<i>Foreign</i>	<i>Any</i>	<i>Domestic</i>	<i>Foreign</i>
1 st	48.0	39.8	8.2	43.7	43.1	1.3
3 rd	71.6	53.0	22.6	60.4	56.1	4.3
5 th	71.1	30.7	42.7	56.9	56.9	0.0
Total	67.6	44.8	25.0	52.4	50.5	2.1
	<i>Share of remittances in household consumption expenditure (%)</i>					
1 st	23.1	20.6	2.5	25.3	24.5	0.8
3 rd	33.7	21.8	11.9	32.4	27.8	4.5
5 th	40.1	13.9	26.2	29.1	29.1	0.0
Total	33.8	19.7	14.1	28.8	26.8	2.0

Source: PIHS (1998-99). AJK nos. are for the entire province.

11. The high incidence of remittances may also partly explain the relatively low proportion of population actively engaged in the labor market prior to the earthquake (29 percent of population of age 10 and above). Low participation and the propensity to migrate also likely reflect lack of employment opportunities, especially in the formal private sector in the affected areas of both provinces. The small size of the manufacturing, finance and business sectors in terms of employment generated suggest the lack of such opportunities.

Damage Estimates

12. Given the profile of livelihoods outlined above, the most severe impacts on livelihoods are likely to occur through loss of livestock and other agricultural inputs, including land, in rural areas; and losses to private assets suffered by traders and small businesses. The significant damage to public infrastructure, on the other hand, is not likely to lead to direct losses in employment among government employees. However, the shock to infrastructure as well as institutional capacity of the local governments is likely to have additional impact on the ability of markets, businesses and rehabilitation efforts to function effectively.

13. From the preliminary statistics on damage, the largest losses in urban employment are likely to have occurred in the private sector – including trade, small shops and businesses, construction and transport. This sector is likely to have included significant proportions of private sector employees and self-employed individuals. Preliminary numbers suggest extensive damage. For example, over 70 percent of shops have been fully or partially damaged in Batagram, Muzaffarabad and Bagh districts. Even shops and businesses that have escaped damage face enormous challenges, given the loss of markets and the uncertainty of demand due to large-scale migration from some areas.

14. The largest source of livelihood loss in rural areas is likely to be disruptions in agricultural and livestock-based activities, like milk production. In agriculture, a temporary loss in output and employment can occur due to inability to harvest crops, loss of acreage for cultivation, and inability to prepare land for the next season. In the words of a woman (a household head from village Raj Khandi, altitude 5,500 feet, north of Muzaffarabad): “.....the standing crop is being eaten by remaining goats, cattle and chicken; and what was left from that we have eaten ourselves”.

15. Livestock losses, besides representing significant losses in terms of capital assets, are also likely to have enormous impact on the incomes of households. In many rural households, livestock (buffaloes, cows, goats, sheep, and poultry) are a primary source of self-employment. All available sources indicate that significant losses in livestock have occurred, especially among households located at higher altitudes.

16. Early assessments indicate that all the factors above resulted in farm income losses of over 35 percent among affected households in four districts, and that of almost 50 percent in Bagh and Batagram districts. These losses obviously represent a significant shock to livelihoods in rural areas.

17. Aggregating across all sectors, the total estimated loss in employment or livelihood is around 324,000, which is around 29 percent of the total employed population (above age 10) in the eight districts (Table 3). The provincial breakdown is around 132,000 in AJK and 192,000 in NWFP, which amount to 38 and 25 percent of total employment in the affected districts of the two provinces, respectively. The largest job losses are in agriculture, trade (small businesses, shops) and construction. Given the lack of adequate information on lost employment, these figures are extrapolated from various proxies: output/household income losses in agriculture, and damages to shops, businesses, roads and transport.¹² No employment loss is assumed for migrant workers and public sector employees.

¹² These numbers should be considered preliminary and rough, and are likely to mask loss in female employment in household-based activities, which are typically under-counted in survey data and even in national accounting. The estimates also imply linear extrapolation from output or capital losses to employment, which can be misleading, particularly in the case of subsistence agriculture.

Table 3: Employment Losses by Province and Sector

	AJK			NWFP			Total		
	Pre-quake empl	% loss	empl loss	Pre-quake empl	% loss	empl loss	Pre-quake Empl.	% loss	Empl. loss
Agriculture & Forestry	117,672	34	39,834	359,110	32	116,003	476,782	33	155,837
Mining	51	83	42	2,933	39	1,157	2,984	40	1,199
Manufacturing	16,200	84	13,685	14,515	34	4,881	30,715	60	18,566
Utility	1,222	85	1,044	6,050	32	1,926	7,272	41	2,970
Construction	39,506	84	33,245	73,292	32	23,781	112,798	51	57,027
Trade	29,350	85	25,071	59,482	34	19,932	88,832	51	45,004
Transport etc	12,722	42	5,356	40,590	27	10,886	53,312	30	16,242
Finance & Business	1,487	86	1,278	3,752	33	1,255	5,239	48	2,534
Services & Public Adm	123,156	7	9,116	188,876	3	5,627	312,032	5	14,743
Other	8,330	40	3,292	22,406	31	6,936	30,736	33	10,229
Total	349,697	38	131,964	771,005	25	192,385	1,120,702	29	324,349

18. It is important to make a distinction between loss of employment, and the population whose lives are affected by this loss. A preliminary estimate is that the above loss in employment and the resulting income shock has affected around *1.64 million people* in the earthquake-affected districts.¹³ Addressing the short term needs of this vulnerable population for a period of six months, *assuming that food requirements are fully met* through a continuing relief program, would notionally require Rs. 3.5 billion (US\$58.7 million). This figure is arrived at using the national poverty line as a reference, netting out the food component.¹⁴ If basic food requirement is also included in the estimate, the amount will increase to around Rs. 8 billion (US\$133.5 million). In addition, an estimated Rs. 2.3 billion (US\$38 million) will be needed as a one-time grant to micro-entrepreneurs to help them rebuild lost assets (as explained in paragraph 30 below). Thus in aggregate, the total needs for livelihood support in the form of grants are estimated at Rs. 10.3 billion (US\$171.5 million), or Rs. 5.8 billion (US\$97 million) net of food support.

19. Finally, given the high incidence of remittances in affected areas, it is also important to consider the possible impact of the disaster on remittance flows and employment of migrant workers. The inflow of remittances can also be an important element of the coping strategies of households, particularly in the context of shocks suffered to other sources of livelihood. Among households receiving remittances, there is likely to be an impact on the flows, particularly if they rely on post offices and banks for transfer of money. In Muzaffarabad District alone, 9 out of 12 rural post offices are not functional. According to the State Bank of Pakistan, 230 branches were operational in the affected areas before the earthquake. 200 branches that were affected have resumed operations, while 18 have been completely destroyed. To the extent that households were relying on private networks to receive remittances, these networks also may have been temporarily disrupted. Employment losses among migrant workers are only likely in the event that they have to return to their homes to help their families to rebuild. The net impact of this on

¹³ This estimate is arrived at by applying the ratio of total number of employed persons to total population in affected districts, as reported by Census (1998).

¹⁴ The official poverty line was set at Rs. 674 of monthly household expenditure per equivalent adult at 1998-99 prices, which is Rs. 816 *per capita* at *current prices*. The food component of Rs. 457 at current prices is computed by multiplying the poverty line with the average share of food consumption expenditure among the poor. Subtracting this from the poverty line yields Rs. 359 per capita per month as the amount needed to meet basic needs, *net of food*.

livelihoods is uncertain, since it is equally likely that some of the migrants may decide to relocate their entire families outside the affected areas.

C. Reconstruction and Recovery Strategy

20. A disaster of this magnitude that has affected all types of public and privately owned assets critical for economic activity and employment, calls for a multi-sectoral approach. The livelihood rehabilitation strategy suggested below that is focused on the most vulnerable households and enterprises among the affected communities will be more effective if complemented by adequate investments in rebuilding public infrastructure like roads, post offices, schools, health clinics and provision of housing.

21. Reviving livelihoods and the local economies of affected areas necessitates a multi-pronged approach that rebuilds assets to generate income and employment, and protects the most vulnerable members of the community. Since the impact of the disaster is not uniform across affected districts and communities within districts, the overall support for livelihood will need to ensure that no affected community is left behind, which will be a significant challenge given the remoteness of certain areas due to the mountainous terrain. The challenge in the short-term will also be compounded by the onset of winter, which will likely delay reconstruction of permanent housing and infrastructure.

22. A livelihood support strategy should be geared towards the following objectives: (i) protecting the most vulnerable in the short-term; (ii) rejuvenating economic activity in affected areas – including reviving small businesses and trades and replacing assets lost in agriculture, including livestock; and (iii) creating employment opportunities for those permanently disabled by the earthquake, by providing training and skills enhancement programs.

Mitigating Vulnerability in the Short-run

23. **Cash grants.** Given the magnitude of losses in employment and its impact on lives, cash grants to affected families can help in mitigating vulnerability in the short-run. These grants should commence soon after the relief operations have stabilized, and take the form of a monthly livelihood/income support of a fixed amount, recurring over a period of four to six months. These will have the benefit of providing a full cash equivalent to households, offering them the flexibility to acquire goods according to their needs. The words of a farmer from Raj Khandi village (altitude: 5,500 feet, north of Muzaffarabad) attests the need for such flexibility in rebuilding lives: “we know where to get what we want to renew our lives – we just need the money”.

24. Given the shock sustained by district/local administrations, the ongoing challenges of providing emergency relief, and the impending onset of winter, initiating other forms of livelihood generation programs is likely to take some time. During this interim period, as experience in other countries has shown, cash grants can be effective in protecting the vulnerable, as well as in helping regenerate local economies by creating purchasing power in affected areas. The success of such a program, however, is predicated on the availability of adequate supplies to markets, and indeed the functioning of markets themselves.

25. The program should target households who have lost their capacity to earn livelihood, temporarily or permanently. Identification of beneficiaries should be based on clear eligibility criteria, and facilitated by community-level participation, for example through committees consisting of trusted community members. Targeting women can also be an effective option, since male members of many households in these areas are likely to be working elsewhere. The amount of assistance provided should be enough for an average family to acquire its basic necessities, which can be set with reference to the national poverty line for Pakistan. Monitoring will be essential to ensure delivery of assistance to intended beneficiaries and to minimize exclusion of the deserving. As other programs like cash for work

are put in place, and/or real employment is generated through the revival of local economies, the cash grants can be phased out. Some of the beneficiaries, for example the disabled, may however need extended support and should be integrated into the country's regular social assistance programs, like Zakat or Bait-ul-Mal.

26. **Cash for work.** Over a slightly longer time horizon, namely in four to six months, a cash for work program can be effective in generating temporary employment, along with rebuilding community infrastructure. Under such a program, those who are able and willing to work can be mobilized to undertake small repair jobs of public infrastructure, for an appropriate wage. International best practices suggest that such programs benefit the intended target group if wages are set below the prevailing market wage for unskilled labor, to ensure that those who are able and willing to work self-select into the program. The other guiding principles are a high share of wage cost in total outlays, which would imply the use of labor-intensive technologies, and to ensure that the community assets created is of value to the affected communities.

27. Given there is no large-scale public works program in the country, and the high rate of migration of adult male members in the affected areas, it is difficult to ascertain a priori whether people (and women in particular) will be willing to engage in manual labor. Demand for such a program may also differ across different areas within the affected districts. Carefully designed pilots will be necessary to assess these conditions before the program can be implemented on a large scale. A ready mechanism for such pilots may be available in affected areas where community infrastructure projects are currently ongoing.

Rebuilding Livelihoods in the Medium-term

28. **Microfinance.** While the options described above are geared towards short-term income support to provide a basic minimum need, generating sustainable livelihoods in a post-disaster situation critically requires reviving economic activities and markets. To jump-start this process, there is a need to replace lost productive assets, particularly for those entrepreneurs in the informal sector (like small shops and businesses) as well as livestock owners who are likely to lack access to commercial bank loans due to lack of collateral even in normal circumstances. This assistance can take the form of expanding microfinance coverage to include affected entrepreneurs and livestock owners. However, in the immediate aftermath of the disaster, grants may be extended to micro-entrepreneurs, particularly those who have experienced severe losses and have very limited access to formal channels of finance.

29. In Pakistan, the Rural Support Networks (NRSP in AJK and SRSP in NWFP) are already operating in many of the affected areas. NRSP, for example, has extended a large number of loans to small shop owners and livestock owners in the higher altitude areas of Bagh and Poonch districts, with a significant proportion of its clients being women. Such programs can be readily expanded and mobilized to deliver microfinance. An ongoing census of affected villages by NRSP can provide the basis for identifying the needs and beneficiaries of such a program.

30. A rough estimate for a one-time grant to micro-entrepreneurs (shop owners and livestock owners) to revive their livelihoods is around Rs. 2.3 billion (\$38 million). This figure is arrived at by taking around 10 percent of the value of direct damages to shops and 20 percent of value of livestock lost. The higher share of grant financing for livestock owners is justified by the fact that many of them are likely to be poor, subsistence farmers for whom the livestock represents the only productive asset. According to these estimates, 64 percent of grants will target livestock owners.

31. The success of initiatives to revive small businesses hinges on the rebuilding of the roads and transportation networks, to ease access to supplies and connect markets. Not having such complementary programs in place will likely lead to further erosion of markets, as investments will reduce, further reducing employment opportunities and purchasing power.

32. ***Skills enhancement for permanently disabled.*** The high incidence of severe injuries, many of which may lead to permanent disabilities, suggests a critical need for a strategy to rehabilitate and re-train such individuals. The immediate need is for medical rehabilitation and assistive devices to improve their mobility. Moreover, given the challenges the disabled will face in accessing services, special efforts should be made to ensure that they are not excluded from receiving relief packages, as well as benefits like cash grants. In the medium term, it is important to recognize that many of the disabled would have been engaged in physical activities like agriculture or livestock-rearing prior to the earthquake. The enormous challenge therefore will be to rehabilitate such individuals, through training in suitable vocations and employing community-based rehabilitation approaches. The recently announced national disability policy and the action plan must be swiftly adapted and operationalized to respond to the expanded needs created by the earthquake.

ANNEX 3 – GOVERNANCE

A. Introduction

1. International experience, most recently acquired from reconstruction and recovery efforts in response to the Gujarat earthquake and the 2004 tsunami, demonstrates that while rescue and relief operations can be relatively quick to mobilize, the process of converting financial commitments to recovery into effective action is marked by unanticipated delays, unrealized expectations and denial of rights. Recovery operations perform better when they articulate with local governing arrangements and avoid relying too heavily on special purpose, executive arrangements that operate outside mainstream governance institutions. Legally mandated and functioning local authorities should not be ignored; experience elsewhere shows that they can be the determining factor in ensuring speedy and appropriate responses.

2. This annex provides a preliminary assessment of the impact of the earthquake on civil administration¹⁵ (including judiciary and police) responsible at the District level in AJK and the five NWFP Districts (Mansehra, Abbottabad, Shangla, Batagram and Kohistan) affected, and recommends ways in which the governance impact can be mitigated at the same time as defining features of implementation arrangements for the responses proposed by other clusters of the overall mission.¹⁶

Governance Arrangements in Summary

3. Governance arrangements in AJK and NWFP affected areas are significantly different. The *Azad Government of Jammu and Kashmir* operates under the Interim Constitution Act, 1974, with a Parliamentary government and a 48 member Legislative Assembly. Some subjects are administered by the AJK Council, which has 14 members, 6 representing the Government of Pakistan. By convention, the heads of Administration, Police, Accounts, Development and Finance are appointed by the Government of Pakistan in consultation with the Government of AJK. Administration is headed by a Chief Secretary, responsible for 14 departments. AJK is divided into two divisions¹⁷, headed by a Divisional Commissioner, to who report Deputy Commissioners responsible for coordination of administrative departments at district level, and for general law enforcement. Municipal services are provided by a system of local governments which are differently arranged in urban and rural areas. Policing is administered by an Inspector General Police. A Supreme Court and High Court is present, both with extensive appellate and limited original jurisdiction. District judges perform both civil and criminal work. Tribunals of Judges and Qazis try criminal cases involving Islamic law. Jurisdiction for most regulatory laws rests with the District and Sub-divisional Magistrates, that is, the District Commissioner's offices. AJK also has an Ombudsman.

4. The structure, functions and powers of *NWFP government* is as provided for in the Constitution 1973. Since 2001, the Local Government Ordinance led to the establishment of elected councils at District, Tehsil and Union levels, headed by an elected Nazim. Although elections for District and Tehsil Nazims were held on 6 October, two days before the earthquake, the winners had not yet taken the oath of office. Elections for Tehsil and District Naib Nazims, who are conveners of respective councils, had not

¹⁵ Civil administration here includes the core administrative offices of a) AJK government, b) divisional/district/sub-district authority as applicable in AJK and NWFP, responsible for coordination, finance/planning, revenue, accounts and audit, c) police and prisons, and d) judiciary including in AJK Supreme and district courts, and in NWFP the subordinate offices of the District and Sessions Judge.

¹⁶ ERP institutional, implementation arrangements are not detailed here, but included in the main report.

¹⁷ Muzaffarabad Division comprises districts of Muzaffarabad, Neelam, Rawalakot, Bagh and Sudhnoti. Mirpur Division comprises districts of Mirpur, Kotli and Bhimber.

occurred. This situation causes some confusion about the role of elected leaders in the immediate aftermath of the earthquake. As provided under the Police Order 2002 (Amended), policing is headed by a District Police Officer who has an accountability relationship with the district nazim, a District Public Safety Commission and the Province Police Officer. NWFP has no office of Ombudsman.

5. NGOs and other civil society organizations are active in all affected districts. They comprise: a) international and national relief/development organizations, for which the Pakistan NGO Forum is the apex body, currently operating through the NGO Joint Action Committee, a coalition of more than 100 national and local NGOs; b) the Rural Support Program's network, working through the Sarhad RSP in NWFP, and the National RSP in AJK; and c) in AJK, several religious organizations working independently of the larger NGO community. No formal coordination mechanisms exist in the affected districts, although some international NGOs report good coordination with military authorities and in the aftermath of the earthquake, new, sporadic coordinative arrangements have been created at district, tehsil and union council levels.

Methodology

6. The ten-member damage assessment team comprised two sub-teams, which visited AJK and NWFP respectively. These teams, comprising 7 people, assessed damage in terms of assets and infrastructure as well as functions, products and services. Visits were made to all four affected districts in AJK and four of the five districts in NWFP (excluding Shangla district). A third, 3-person sub-team focused on institutional arrangements for governing the response. Consultations were held with province/state, district and sub-district elected and administrative officials and civil society.

B. Damage Overview and Recovery Needs

7. Overall, given the scale of damage to buildings, equipment and logistics, and the trauma associated with loss of life and injury, civil administration, public safety and justice institutions have responded well to the crisis. Initially, civil administration in AJK districts, Muzaffarabad, Neelum, Rawalakot and Bagh, was severely disrupted by the destruction of administrative complexes and sub-divisional office buildings in Hattian, Haveli, Dhirkot, Abbasspur, Hajira and Neelum. Fifty-five provincial office buildings¹⁸ and 9 (90%) district and 249 provincial officers' residences were destroyed and the offices of the Civil Secretariat were damaged. Moreover, although a large number (134) of vehicles and communication equipment were destroyed, or are missing, and office equipment was lost in all destroyed buildings, temporary accommodation and interim arrangements, including deployment of executive officers from Punjab, appear to have enabled state and district administrations to function, albeit preoccupied with the relief and rescue efforts.

8. AJK's Supreme Court and High Court buildings are damaged, but partially operational. District judicial complexes have been completely lost in Muzaffarabad, Rawalakot and Bagh. Sub divisional office buildings and residences of judiciary at Hattian, Haveli, Dhirkot, Abbasspur, Hajira and Neelum were destroyed. However, interim arrangements were quickly made, and although the judiciary was on call, court work is at a stand-still. District police complexes and jails were completely destroyed in Muzaffarabad, Rawalakot and Bagh (15 of 20 stations), as were sub-divisional office buildings in Hattian, Haveli, Dhirkot, Abbasspur, Hajira and Neelum. Policing was severely affected by the loss of communications equipment, and although there were reports of violence and looting in the immediate aftermath, order was quickly restored. In general, police efficiency is not likely to be impaired in any major way in the near future, although providing protection services for incoming relief workers is drawing resources away from public safety work, and special efforts will be needed to protect the rights of women, orphans, disabled and missing persons.

¹⁸ Including Central Police Offices.

9. Important in this respect will be efforts to recover public records. In affected municipalities, 85% of municipal records appear to have been lost, including births and deaths records, and 25% of revenue records. The latter, although lost, may be substantially reconstructed from records of the Settlements Commissioner.¹⁹ A small number of Supreme and High Court judicial records have been destroyed and 30% of judicial records in 20 affected district courts have been destroyed or badly damaged. There is evidence of arson of court records on the day of the earthquake at Bagh. The Ombudsman’s office was destroyed along with most records. Records were completely lost in all destroyed police stations. Officials have quickly acted to recover records where possible, and in most cases they may be reconstructed from records held at higher levels.

10. In NWFP districts, Mansehra, Batagram and Abbottabad, around 65% of district and tehsil buildings have been either destroyed or badly damaged, with the extreme being Balakot, where all buildings were destroyed. 60 district police offices and judicial complexes were destroyed or badly damaged. The functioning of civil administration was quickly restored in Mansehra and Abbottabad, and by the time of the assessment, also in Batagram, both through local effort and deployment of additional staff by the provincial government. Although elected councilors were active in localized relief efforts, local councils as such, have ceased to function and civil administrations are largely operating under executive orders, a situation constrained by the fact that relevant elected officials had not been sworn into office. With the exception of Balakot, judicial officers, often in temporary accommodation, are available for work, but as with AJK, court work is at a stand-still. NWFP government dispatched 2000 additional police officers to affected districts, although, as with AJK, police report very little crime against property or persons. They are largely engaged with policing the relief effort, including VIP protection. Concern to recover, protect and reconstruct records was also evident in all affected districts. While records have been buried under collapsed buildings in almost all Batagram district and tehsil offices and in all Balakot tehsil offices, these are being retrieved. Special effort must be made to recover and reconstruct records in Balakot.

Table 1: Governance Sector Damage in AJK and NWFP

Governance Sector	NWFP			AJK		
	Buildings	Logistics	Total	Buildings	Logistics	Total
Civil Administration	148.7	18.1	166.8	721.2	332.4	1,053.6
Judiciary	313.8	19.9	333.7	373.1	147.2	520.3
Police	397.3	43.2	440.5	403.6	52.7	456.3
Total	859.8	81.2	941.0	1,497.9	532.3	2,030.2
Grand Total	Rs. 2,971.2 million (US\$50 million)					

Note: The average age of the public buildings in the affected areas is assumed to be 15 years.

¹⁹ However, verifying authenticity of mutations that have occurred in the last 6 years will be problematic.

Table 2: Governance Sector Replacement Costs in AJK and NWFP

Governance Sector	NWFP			AJK		
	Buildings	Logistics	Total	Buildings	Logistics	Total
Civil Administration	229.6	18.1	247.7	1,113.6	332.4	1,446.0
Judiciary	484.6	19.9	504.4	576.1	147.2	723.3
Police	613.5	43.2	656.7	623.2	52.7	675.9
Total	1,327.7	81.2	1,408.8	2,313.0	532.3	2,845.3
Grand Total	Rs. 4,254.1 million (US\$71.6 million)					

Note: The average age of the public buildings in the affected areas is assumed to be 15 years.

C. Reconstruction and Recovery Strategy

11. **Approach.** Effective and timely post-disaster rehabilitation and recovery has occurred where the following governance and institutional principles have been observed: (i) offer people-centered solutions; ii) build on the principle of subsidiarity, by ensuring that reconstruction activity is designed and implemented by the lowest level of mandated and competent authority; (iii) provide durable arrangements which assign clear responsibilities for central and localized strategic coordination; (iv) assess needs and define sectoral technical responses in ways that avoid unmanageable demands; (v) create innovative institutional arrangements through which specialized expertise can be mobilized and held accountable; and (vi) stipulate validation, audit, accountability and judicial arrangements which enhance the predictability of outcomes for the common citizen.

Critical Issues and Actions

1. People-centered solutions

- ***Favor in situ responses and citizen choices for primary needs where possible.*** In the immediate relief phase, affected people are best placed to assess their own needs, and with flexible external support, make arrangements for their shelter/housing and security, and restore their livelihoods with due regard for the environment.
- ***Secure identities and entitlements.*** To minimize opportunities for their misdirection, and to secure the rights of affected people, centrally coordinated, but decentralized systems for securing lost records on revenue, property, death, birth, banking, police, judiciary, state and community land is a priority. In this regard, Government may impose a ban on land transfers in areas where records have been lost, until reconstructed, and extend the period of limitation by six months to make provision for time for relief and rehabilitation. Likewise, Government may wish to issue identity documents to all people in earthquake affected areas, including children (through regular NIC and temporary cards).
- ***Special purpose actions to ensure justice for vulnerable populations.*** It is advisable to establish special institutional and legal arrangements for protection of property of orphaned children, women and missing persons and increase vigilance of abduction and trafficking.
- ***Anticipate that delay and dispute will deny justice.*** In the absence of special purpose, short-cut administrative arrangements, securing civil rights is more protracted and unpredictable in post-disaster situations. Government may wish to suspend all fees associated with court appearances, registration, mutation, issuance of certifications for 18 months, strengthen and simplify evidential

and procedural rules for compensation in tort cases, simplify police procedures, and establish contracted public information, legal aid and facilitation and advisory services at district level, with focus on vulnerable populations.

- **Engage civil society for interest articulation.** Opportunities to positively engage CSOs in recovery operations are needed to facilitate needs assessments, articulate demand, facilitate access to information, promote third party verification and provide legal facilitation and aid to affected populations.
- **Facilitate private sector recovery for livelihood and service delivery.** It is important to make explicit the private sector impact in service delivery sectors. Private sector recovery will be helped if compensatory actions that distort market response are minimized.
- **Restore functional mandates of local elected representatives.** A clear strategy is needed for the transition from relief/rescue to recovery phases. This will be eased if milestones are agreed for: i) transition from military to civilian control; and ii) transition from expedient, short term executive controls to legally sanctioned local elected leadership.

2. Subsidiarity and restoration of responsibility to legally mandated institutions is important for speed, relevance and accountability of recovery operations.

- **Restore authority and resource legally mandated institutions.** Centralize strategic planning of the recovery strategy, but return responsibility for all other executive functions to the lowest level of mandated and competent authority together with support to meet capacity gaps. This will enable recovery operations to exploit local knowledge while also building local capacity for the restoration of government capacity. Government will need to announce policy commitments to return responsibility for recovery operations to mandated local authorities and prepare and agree protocols for responsibility and reporting of district, tehsil authorities, relief commission, army and civil society in recovery operations. Likewise there will be a need to assist province/state and local authorities in reviewing existing donor assisted project agreements for recovery operations and establishing arrangements for NGO input.
- **Exploit existing arrangements.** To a greater (NWFP) and lesser (AJK) extent, local elected leaders are responsible to direct executive decisions. For most sectors affected, coordinative and regulatory arrangements exist and should be restored as soon as possible. In addition, in most sectors, opportunities exist to exploit existing arrangements for planning, execution and accountability of recovery operations.

3. Prioritize district and central strategic coordination and accountability

- **Prioritize district coordination strategies.** While restoring accountability of the local administration to elected representatives, special purpose district arrangements are needed to facilitate coordination between army and civilian agencies and civil society.
- **Central and Provincial strategic accountability.** Clear assignment of responsibilities for the following functions is required, at national and province/state levels: i) cross sectoral policy coordination; ii) multi-agency coordination; iii) information clearing house on responses, iv) documenting government and donor commitments, v) monitoring compliance with agreements; and vi) advising on inventive revenue raising options.
- **Avoid new, multi-function, inter-governmental, single structure, institutional arrangements.** International post-disaster and national experience is that such arrangements should be avoided where: i) control over execution/operations is at stake; ii) the legal status of the agency is likely to be contested; iii) political contests amongst levels of government are likely to be exacerbated; and iv) where transaction-intensive responses are required.

- **Tailor donor alignments according to sector features, scale of damage, and comparative advantage.** Some sectoral responses are amenable to engagement by many donors, whereas this may disable other, networked sectors with fewer responsible agencies. Similarly, donors have comparative advantages, due to long engagement and familiarity with sectors/agencies, and should be constrained from entering new engagements/sectors. Donors should agree and publicize commitments, coordinative arrangements and accountability at national, province/state and local levels, reflecting comparative advantage and capacity to respond. Donors will have a key role to play in assisting province/state and local authorities to define clear arrangements for coordination of recovery planning, budgeting, implementation, monitoring and public access to information; assisting affected local authorities to establish multi-agency coordination arrangements; and assisting districts and tehsils to prepare detailed surveys to ascertain damage to assets and infrastructure of civil, judicial, police and prisons

4. Manage demands through technical and policy choices. This will improve the speed of recovery responses.

- **Replacement vs. extension.** In replacing lost facilities and services, their extension should be limited to cases where the cost is marginal and efficiency gains are obvious. On the other hand, for equity reasons, the design principle should be adequate coverage of all affected people, rather than replacement of facilities known to be under-serving or inadequate prior to the disaster. Government, in many cases, will need to provide guidelines to local authorities on investments eligible for inclusion in financing and earthquake recovery operations
- **Replacement vs. reform.** Recovery operations present opportunities to reform service delivery. However, reforms that are likely to be contested should be limited. Reforms should focus on situations where replacement of lost infrastructure is unlikely to impact on service access or quality. District/tehsil authorities will likely need assistance to adequately review detailed needs assessments prepared by external agencies, and participate in their reconciliation with local priorities.
- **Reduce demand by technical solutions.** Where possible, sector responses should favor gender sensitive and environmentally sound repair and rehabilitation over wholesale reconstruction with due regard to local knowledge and materials. Standard unit designs for common facilities assist larger contracting options, and reduce load on supervisory and adjudicative agencies.

5. Enhance operational capacity to respond by known institutional solutions

- **Seek umbrella approvals for multiple standard works and responses.** Umbrella approvals can facilitate larger scale contracting and common protocols for key steps. Modifications should maintain the integrity of government budget, planning and approval mechanisms.
- **Inventive solutions for short term augmenting of local capacity.** Anticipating and making explicit the expected increase in responsibilities of local authorities can make options for augmenting capacity more transparent. Government may need to assist affected province/state, districts/tehsils (NWFP) to review annual development plans, to cull schemes made unviable by the earthquake and prepare protocols for appraisal of investment schemes in affected communities.
- **Multiple solutions, not single, privileged institutional arrangements.** Exploiting existing assignments will encourage multiple institutional arrangements through which works and services are currently delivered. Authorities will need to prepare development scheme approval procedures to respond to recovery needs

- **Selective government direction of private sector, but only in strategically important cases.** Whereas most private sectors impacted by the quake are deregulated, and market responses should be facilitated, where market response fails and this may cause humanitarian crises, government direction of the market may be justified.
- **Provide specific technical capacities.** ERRA will need to develop inventive arrangements to augment local capacity to meet responsibilities for planning, budgeting, implementation and quality assurance of recovery operations. Donors or Government will need to Provide AJK government with procurement/contracting specialists, on short term assignment, for transparency on relief operations, and prepare systems for recovery operations. Likewise, local authorities will need assistance to establish credible pre-qualification lists or local contractors, for recovery operations. ERRA and province/state authorities may need to negotiate arrangements to draw on tertiary institutions and other civil service agencies to augment local capacity for recovery operations

6. Accountability and enforcement of standards and norms require administrative dispute systems and full extension of supreme audit institutions, but these must be backed by functioning judiciary and legal institutions.

- **Reinforce arrangements which enhance predictability.** The performance of agencies responsible for recovery operations and the security of citizen rights require functioning administrative dispute resolution systems, campaigns to ensure citizens have access to information, and a legal infrastructure to support the credibility of these arrangements. In this regard, ERRA may facilitate establishment of systems to ensure public access to information regarding all recovery operations and which government services are operational. There is also a need to enhance management capacity of AJK Home Department for response monitoring and evaluation.
- **Audit, validation, interdiction.** A common donor, government, civil society commitment to zero tolerance for corruption must be backed by full extension of the Auditor General of Pakistan jurisdiction to all agencies involved in recovery operations, third party verification of contracts, and use of Pakistan’s existing arrangements for community based social audit. The AGP should undertake audits of all expenditure of ERP funds by any agency, and resource AGP offices in affected districts to fulfill responsibilities
- **Enhance formal justice institutions.** Court annexed alternate dispute resolution, for private disputes and grievances against officials can reduce the load on an already over-burdened judiciary. Reinforcing the capacity of Ombudsman’s offices can likewise assist and capacity of newly established office of the Director General Audit, AJK will need to be enhanced. The High Courts need to identify priority areas for lower judiciary—custody, guardianship, property disputes, succession, tort and compensation, and criminal matters—and measures to expedite dispensation of justice. The High Court Member Inspection Teams need to be engaged to assist lower judiciary to prioritize and rationalize pendency lists, and monitor performance, and AJK Office of the Ombudsman needs to become functional.

ANNEX 4 – HAZARD RISK MANAGEMENT

A. Introduction

1. Pakistan is subject to a number of natural hazards, of which flooding, earthquakes, cyclones and drought/heat waves are the most significant. Floods, droughts and landslides in Pakistan tend to be frequent, seasonal, and localized. The snowmelt from the high mountains coinciding with the monsoon season leads to very large discharges of the Indus River and its tributaries, resulting in annual floods. In February and March 2005, large areas of Pakistan were battered by rain, snowfall and flooding. The worst affected areas were NWFP, the Northern Areas, and Balochistan. Water supply and sanitation systems, electricity, communication and road links were severely affected. In Balochistan, nearly half a million people were affected, with more than 4,000 families left homeless. In NWFP more than 80,000 houses were destroyed and over 108,000 were damaged. A number of dams collapsed due to excessive flooding, causing severe destruction to crops and livestock.

2. The earthquake hazard in Pakistan is high and derives from Pakistan's position on the eastern margin of the collision of the Indian plate with the Eurasian plate. The result is the potential for major earthquakes in the north, where the Indian plate thrusts under the Himalayas, and along the western edge of the country, where transform motion of the Indian plate relative to the Iranian and Afghan micro-plates is expressed with the Chaman fault. The 1935 Quetta earthquake (60,000 killed) occurred on the Chaman fault. The Arabian plate subducts beneath the Iranian plate along Makran coast, where the 1945 magnitude 7.9 earthquake resulted in a tsunami with 12 meter waves. Karachi, east of the Makran coast, has significant seismic risk due to several nearby faults, including the Allah Bund fault (1819 earthquake), and the Pubb fault.

Institutional Structure and Legal Framework for Hazard Risk Management

3. Although it is prone to a variety of natural hazards, Pakistan has an ad hoc approach to dealing with hazard risk management. Interventions are primarily focused on relief and response as opposed to ex ante mitigation measures.

4. At the national level, there are systems in place for providing relief following a disaster through the Emergency Relief Cell (ERC) that lies within the Cabinet Division. The ERC is tasked with coordinating federal response to disasters; to provide resources to provincial and district governments in the event of a disaster; administer federal relief funds, and maintain stockpiles of relief goods for distribution following a disaster. Each Province and District has individual relief units responsible for liaising with affected communities and the central ERC to coordinate emergency response and relief distribution.

5. The Federal Flood Commission (FFC) and the Pakistan Meteorology Department also assemble and disseminate data on weather-based, geophysical and seismic hazards at the national level. Pakistan's military forces are an important player in organizing logistics for response to larger-scale disasters; following the devastating 2005 earthquake, the military was a main focal point for relief and emergency response. Other Government agencies and line ministries, such as the Dams Safety Council, and the Space and Upper Atmosphere Research Commission (SUPARCO), the Geological Survey of Pakistan, the Department of Environment, and the Civil Defense Department, are involved to varying degrees in post-disaster planning and recovery efforts, with limited mitigation interventions.

6. In terms of a legal mechanism for disaster management, the National Calamities (Prevention and Relief) Act of 1958 gives a framework for government response to, and to some extent, preparation for disasters nationwide. The recent Local Government Ordinance (2001) includes provisions for local

governments at the District, Tehsil, and Union level to develop and enact disaster management and risk mitigation measures, but the Provincial Government still has authority and influence over ordinance applications, and few strategic hazard risk management activities have been implemented to date.

B. Reconstruction and Recovery Strategy

7. In light of the devastation caused by the 2005 earthquake, it is important to take into account some of the factors that may have exacerbated the damage in affected areas. These critical issues should be reflected in the design and implementation of the recovery strategy, as existing vulnerabilities should be mitigated as much as possible rather than repeated. The following areas comprise five pillars that elaborate a comprehensive hazard risk management approach: (i) risk identification; (ii) emergency preparedness; (iii) risk reduction; (iv) capacity building; and (v) risk transfer mechanisms. Improvement across these areas can significantly contribute to protecting communities from future disaster impacts.

Pillar I: Risk Identification

8. ***Seismic hazard analysis.*** An event similar to the magnitude of the 2005 earthquake in this region was inevitable and had been generally foretold by scientists as well as by the Pakistan Geological Survey. More significantly, seismotectonic considerations indicate that similar or larger events in the same or neighboring regions are possible. Although the Pakistan Meteorological Department maintains six seismological observatories (Quetta, Peshawar, Islamabad, Lahore, Karachi and Khuzdar), the network is in need of modernization. Efforts to undertake a new seismic risk analysis of Pakistan should also be intensified.

9. ***Multihazard risk assessment.*** Risks from individual natural hazards, particularly floods and droughts, are known; limited progress has also been made to map seismic and landslide hazards. For example, following the earthquake and its aftershocks, the ground movement triggered a series of landslides in steep mountain areas and valleys of AJK and NWFP. These landslides ranged from small rockfalls to large slides that blocked roads, further isolated communities, and caused additional damage. A nationwide, multihazard risk mapping from existing data and further localized assessments should be undertaken to inform reconstruction decisions as well as underpin future development plans and risk transfer mechanisms, such as insurance.

Pillar II: Emergency Preparedness and Response

10. ***National level.*** The Government responded quickly to the disaster and rushed to provide relief and restore basic services to affected communities. Even with its rapid response, the terrain and sheer scale of the disaster required unprecedented logistics and resources to sustain the emergency relief operations. A more clear-cut strategy for emergency preparedness and response at the national level, which builds upon existing entities and mechanisms already in place, should be devised and implemented following the relief phase.

11. ***Local level.*** Following the disaster, communities themselves were the first responders and helped rescue people, address immediate shelter and relief needs, and locate displaced family members. For quick response operations immediately after a disaster, communities should be encouraged to be prepared for emergencies by mutual cooperation before the arrival of external assistance. Local government and NGOs working in affected areas, such as the Pakistan Red Crescent, could help inform and organize community preparedness activities. Emergency drills should also be carried out periodically for better preparedness and public awareness.

Pillar III: Investment in Risk Reduction

12. **Reducing risks in post-earthquake reconstruction.** Post-earthquake reconstruction is a major investment in rebuilding the country. Another earthquake in this region is likely, and floods and landslides are also common occurrences in the affected areas. Therefore the Government should take this opportunity to protect the reconstruction of public and private buildings and infrastructure from various types of hazards. Reconstruction of buildings and infrastructure systems should be conducted in such a manner that they will not be again destroyed when (not if) future earthquakes occur. Building construction in damaged areas needs to occur in conformance with modern seismic codes and good construction practices, so as to not to rebuild the pre-existing vulnerabilities exacerbated by the recent earthquake. Particular attention needs to be paid to the quality of construction, via education of builders, artisans and homeowners, and assured compliance with the current building code. Lessons learned from the current earthquake damage should be fed into reconstruction planning and future risks reduced through improved building standards and design considerations.

13. **Protection of public infrastructure.** A significant amount of public infrastructure was severely damaged by the earthquake. Safety of public buildings such as schools and hospitals is particularly important as they house large numbers of the people, and their survival is critical in emergencies. Medical and educational facilities built in high risk areas should incorporate improved building standards to reduce their risks to hazard impacts. Educational and other public buildings rebuilt should be built safer and should incorporate design specifications in buildings used to double as evacuation centers. It is recommended that the Government create an entity with the requisite technical capacity and mandate to review and approve the designs for public buildings in order to ensure that seismic-resistant standards are applied.

14. **Land use.** Site conditions appear to have played a role in the level of damage sustained in earthquake-affected areas, such as in Muzaffarabad and Balakot. Specific effects need to be analyzed and incorporated into land use planning guidelines for the region. Land use policy is a vital tool in disaster reduction. Land use decisions both in reconstruction of the affected areas, but also in urban development plans, need to integrate identification of high-risk areas into planning decisions. Site investigations for critical facilities should be undertaken as a routine part of construction preparation.

15. **Legislations and standards for future safety.** The large number of deaths attributed to the recent earthquake was the result of the collapse of approximately 200,000 buildings, which left millions of people homeless in difficult to access terrain at the onset of a harsh winter. These buildings collapsed en masse due to their very poor quality and lack of any seismic consideration in their design. As previously mentioned in paragraph 13, the primary lesson to be learned is that new buildings need to be seismically designed and built of a reasonable quality.

16. Building regulation in Pakistan, at least in larger cities, is the responsibility of the municipal government. Building seismic design is stipulated to be per the US Uniform Building Code (1997 edition, or UBC-97). In practice, based on discussions with a number of design professionals, building design for major investments is performed in accordance with UBC-97 using state-of-the-art techniques by qualified professional engineers. These engineers monitor construction in order to assure quality. For small investments, building code compliance would appear to be optional. Building supervision outside of major urban areas was reported to be severely lacking. More attention should be paid to the monitoring and enforcement of current building codes in the design and construction of new structures in seismically active areas throughout the country.

17. **Retrofitting.** During the reconstruction phase, repair of damaged buildings should include seismic strengthening. A financing and technical package should be developed to serve this purpose. Outside the affected areas, buildings in Pakistan are generally very vulnerable to earthquakes, and similar or larger disasters could occur in the future. Therefore, the feasibility of developing and implementing a national seismic retrofitting program should be examined, beginning on a priority basis with public

buildings, such as schools and hospitals. However, it is not feasible that all buildings be immediately rebuilt; moreover, attrition of older buildings over the next several decades will remove many of the most vulnerable structures. A national earthquake risk reduction program for Pakistan is recommended to undertake seismic retrofitting of selected public facilities (schools, hospitals, etc), upgrading of construction quality, research and development of seismic engineering capacity, and risk-based investment planning.

Pillar IV: Capacity Building

18. Current capacities in disaster management are largely focused on emergency response, relief, and post-disaster recovery. A comprehensive risk reduction strategy and an institutional framework to address long term disaster risk reduction issues should be systemized.

19. ***Institutional capacity building and coordination.*** The recent disaster once again revealed the importance of coordination among government agencies from the Federal to village level. The lessons and experiences of relief and recovery coordination should be distilled in developing an appropriate disaster management mechanism and authority that reflects the hazard risks faced by Pakistan. A National Disaster Management Plan would clarify roles, responsibilities and streamline coordination across administrative levels and various stakeholders. Significant coordination among GoP line ministries and agencies should be encouraged in order to improve coordination of response and sharing of data and information for sound actions. A review of different systems from other countries and stakeholder consultations could assist in determining the most effective model for Pakistan.

20. ***Education and training.*** Training and exercising of disaster management plans help to maintain a well functioning system to respond. Systematic training for emergency management should be undertaken in Pakistan. A facility to train relevant officers and authorities in disaster management at all levels should be established. National and local authorities should be routinely trained both on emergency preparedness and principles of risk reduction. At the local level, primary and secondary school textbooks should also raise awareness of risks as part of the education curriculum.

21. With regard to construction and design professionals (i.e., architects and engineers), several levels of licensing exist, but there is no mechanism to update their knowledge in safety standards. A good deal of housing construction happens outside this professional system by small contractors, and in rural areas, by local builders who do not benefit from any such training. Professional education and short training courses could improve compliance with risk reduction measures. Basic training of contractors and builders on safety measures for construction should also be considered as part of the post-earthquake reconstruction plan, as well as transferred to other high risk parts of the country.

22. ***Public awareness-raising.*** Immediately after a disaster, public awareness of disaster risks tends to increase. But in general, this does not translate into sound actions to be taken to reduce their impact. This is evident in Pakistan in the continued encroachment of settlements onto flood plains and landslide-prone areas, despite repeated loss of property and lives. This attitude is partly a consequence of economic pressures, population increases, and urbanization. Particularly for less frequent events like earthquakes, it is also due to limited understanding of risks involved and simple ways of reducing their impact. A major public awareness campaign on reducing vulnerability to various hazards should start while the memory of the earthquake is fresh.

Pillar V: Mechanisms for Risk Transfer and Financing

23. In Pakistan insurance penetration is limited, and individual housing and livelihood insurance against natural disaster losses is not widely practiced. Not only what exists today, but private, Government, and development partner inputs into post-earthquake recovery could be at risk from future

disasters. Risk transfer through insurance allows for the burden of reconstruction to be shared among public and private actors and protects valuable resources.

24. A micro-insurance package to the poor that addresses their main post-disaster risks can indemnify against the loss of life, property, livelihood, and help pay for the cost of living for a few months. At the macro level, national governments should consider investing in ex ante risk reduction measures, such as insurance pools and reserve funds that can be mobilized rapidly. Capital injection by donors and creation of a regional insurance facility could also be considered. The feasibility of these options should be further investigated to fit the context of Pakistan.

25. ***Mitigating the social and economic impacts of future disasters.*** While the recent earthquake was a tragic event and the immediate focus should be on response and recovery, it should be borne in mind that Pakistan will suffer from future earthquakes. In fact, Pakistan has very substantial seismic hazard, so that parts of the response and recovery program should be developed bearing in mind future earthquakes and how the current response and recovery experience can be usefully employed in other parts of Pakistan.

26. In many parts of the world, major earthquakes tend to occur in cycles in which stress builds up in tectonic plates over decades to centuries, which results in increasing seismicity culminating in a large earthquake. Available evidence indicates the Himalayas follow this pattern. The October 8, 2005 earthquake occurred in a region “where a great plate-boundary earthquake has long been considered overdue”²⁰, resulting in only about 25 percent of the energy of the potential great plate-boundary earthquake being released. Release of the remainder of the energy would require a magnitude 7.9 event. The potential exists for the same area affected by the October 8 event, to be affected by a larger earthquake. Beyond the Kashmir seismicity, Quetta and Karachi also have serious seismic risk.

27. Consequently, building and reconstruction in the area damaged by the recent earthquake should occur in conformance with modern seismic codes and good construction practices. Beyond the affected region, older buildings will be removed by attrition over the next several decades, but seismic retrofitting of selected facilities (schools, hospitals, etc), upgrading of construction quality, research and development of earthquake engineering capacity, risk based planning of investments and other actions is required which, combined, form an integrated national earthquake risk reduction program. This earthquake risk reduction program would be a key component of a broader multihazard risk reduction strategy, as previously discussed.

²⁰ Bilham R and K Wallace, (2005), Future Mw>8 earthquakes in the Himalaya: implications from the 26 Dec 2004 Mw=9.0 earthquake on India's eastern plate margin, Geol. Surv. India Spl. Pub. 85, 1-14.

C. Recommendations

28. This section provides cross-cutting recommendations for reducing Pakistan’s overall vulnerability to natural hazards.

- Integrate training and capacity building in seismic safety measures for technical staff, builders and homeowners into reconstruction programs and introduce public awareness raising and community preparedness at schools and communities.
- Review and strengthen the national disaster management system to identify gaps and areas that need improvement, based on lessons learned from the recent earthquake experience.
- Strengthen capacity for seismic engineering and improve systems and incentives for achieving compliance with the current building code.
- Undertake an integrated, multi-hazard vulnerability and risk mapping exercise to provide rational measures for the reconstruction process and for informed land use planning.

ANNEX 5 – SOCIAL IMPACT

A. INTRODUCTION

1. This annex addresses the social impact of the earthquake disaster and the recovery needs of the affected population. These social dimensions have an important bearing on reconstruction in specific sectors, which are covered in more detail in the sectoral annexes. This annex gives an overall presentation, differentiating the immediate impacts and more long term impact and concerns. The assessment has been formulated in consultation with a range of international and national agencies, UN and government institutions working in the affected areas²¹.

B. DAMAGE OVERVIEW AND RECOVERY NEEDS

2. The population and social structures of the earthquake-hit areas has been seriously affected by the number of human deaths. By November 3, the following figures were reported: about 73,000 people were dead and 70,000 injured across NWFP and AJK, probably more than 2.8 million without shelter. These figures may still increase as the more remote of the affected areas are accessed. The victims were mainly from already vulnerable groups, living in comparatively inaccessible mountain areas with lower levels of income and service provision as compared to the national average. Women and children made up a large share of the victims, as many women were caught unaware in houses when the earthquake struck, and the collapse of school buildings resulted in the deaths of many children (close to 3500 students died in government schools alone, without any available data from private and religious schools). Among the injured, many will be permanently disabled due to spinal cord injuries, severe head injuries and injuries to limbs, resulting in a high proportion of amputations. Due to difficulties in access, many victims were not rescued in time and people succumbed to injuries in the absence of medical treatment. Furthermore, the number of permanent disabilities continues to increase, as untreated limb injuries have turned gangrenous and required amputations.

3. **NWFP and AJK.** The total population of the 8 affected districts is 5.7 million (AJK: 1.8 million, NWFP: 3.9 million), of which around 88% lives in rural areas. The affected districts in NWFP and AJK share basic socio-economic characteristics. Apart from pockets of concentrated populations, settlements are generally scattered across the hills and mountains following the topography. The smallest neighborhood comprises 1-2 housing units and the biggest may have over 300, with 2-3 households living in one housing unit. According to the 1998 population census, average family size is 7 in urban areas and 6 in rural areas. About 42% of the population is below the age of 15 years, while 6.7% of population is above the age of 60. Land fragmentation and increasing population has over burdened subsistence agriculture, forcing people to undertake seasonal migration to urban centers of Pakistan and abroad, with some districts in AJK having up to 30%-40% of the population working abroad. The unemployment rate is around 37%, but women constitute only 2% of the active labor force. Especially in the northern part of Neelum valley and in the border areas, and the area near Jhelum River in Bagh and Sudhnuti, access to

²¹ The following government institutions, organizations and agencies have been contacted and/or met: Ministry of Social Welfare, Crisis Center (MOWD), National Institute of Special Education-Ministry of Social Welfare (GOP), EAD (GOP), Bait al Maal (GOP), UNICEF, Pakistan Red Crescent, IFRC, World Vision, Oxfam, Action Aid, Aurat Foundation- Peshawar, Islamic Relief (NGO), Rozan (Pak NGO), Sahil (Pak NGO), NRSP (Pak. NGO), RSPN (Pak NGO), plus information from DFID, CIDA, review of minutes of Protection Cluster, progress write-up from Save the Children USA.

income and development is very limited. A good part of these areas lack access to roads, and people have to travel long distances by foot and pay carriage for transportation of goods.

4. **Unattended children.** The number of orphans and unattended children is feared high, although numbers are as yet unavailable. Unattended children constitute a group which will require special protection immediately and continuing in the medium and long term particularly to help them overcome trauma and prevent exploitation. In the aftermath of the earthquake, with little information available about family members, the government has put a ban on any form of adoption of children from earthquake affected areas. Children are also not allowed to be relocated from their areas without official permission in order to prevent trafficking in children. Some local NGOs and the Ministry of Women's Development are making efforts to meet the protection needs but these have to be scaled up. The Government wants to register every child and the Rapid Registration Form will be used by all agencies of the "Protection Cluster group" (composed of UN, bilateral, international and national NGOs and government of Pakistan). Data will be sent to NCCWD while data on unaccompanied/separated children will be provided to ICRC for registration and tracing the families.

5. Priority must be given to family reunification in the case of separated children, and for orphans culturally-sensitive interim and alternative care options need to be provided. Unnecessary institutionalization of children must be avoided. Psycho-social support and legal protection may also be required, and needs to be provided through local capacities. Awareness raising and training on child rights and child protection should be carried out targeting all concerned actors. Special attention should be paid to children's inheritance rights concerning to land and property, and administration thereof by legal guardian until the child reaches maturity.

6. **Single-headed households.** Widows and single-headed households present a particular vulnerability as they have to deal with their psycho-social distress as well as caring for children on their own. The loss of a mother has particularly negative physical and psychological impact on small children and infants, while the loss of the male head of family constitutes a serious blow to the economic livelihood of the household, significantly reducing its coping ability since the employment opportunities for women outside the household are limited. Particularly in AJK the proportion of female-headed households is already high, around 20%, due to the high level of labor migration. Female headed households are of two types: (i) households where the male member is working abroad or in the big cities of Pakistan with women left to manage the household; and (ii) widows without any male support. Compared to the rest of Pakistan women in AJK face less social restrictions on their mobility and social participation, while the Pathan population in Kohistan, Batagram and Mansehra district tend to practice strict purdah with little mobility and voice for women, which inhibits the outreach of relief work to women and girls, who may find it difficult to register for assistance as well as collect rations and/or cash support on regular basis.

7. **Security of women** in the affected areas is a concern and single women, widows and women-headed households (i.e. without a male guardian) are reportedly reluctant to go to the tent camps for affected people, if these are outside their local area, since they will be among unrelated men, who may belong to another ethnic group and speak a different language. Medical teams furthermore find it difficult to access injured women unless they have female staff, as it according to local traditions is inappropriate for a male medical worker to deal with female patients. Oxfam's assessment of its relief work following the 2003 earthquake in Astore Valley in North Pakistan underlines the importance of having female workers involved in relief distribution teams to ensure that women actually receive the relief items meant for them and clearly understand their usage.

8. **Permanently disabled.** Before the earthquake, around 10% of the population was permanently disabled, and their support systems, however informal, may have been destroyed and they are a particularly vulnerable group in terms of accessing relief. If the only route to survival is to walk out of a

valley, or to have the mental alertness to register for assistance, then the risk of disabled, old and other vulnerable groups being left out is very high.

9. **Shock and trauma.** The very high death toll and number of severe injuries in addition to the widespread material damage will have long-term consequences for the well-being of surviving family members, particularly widows, single-parent children, orphans, and the elderly. Severe shocks and trauma are widespread among bereaved families, particularly among children, and comprehensive psycho-social support is required, adapted to the social-cultural background of the affected communities.

10. **Shelter.** Strong community cohesion is a common feature of small isolated communities, and particularly in AJK, there is a very close-knit social structure and social support mechanism through the extended family and biradari system, which will serve as an important coping mechanism both for emotional, social and financial needs. However, the loss of human lives and the scale of material damage and displacement have been so great, that in many communities these usual support structures may be destroyed as well. In the relief camps, the Army and relief agencies attempt to settle households from each local community together. Tent camps have been set up around the affected areas, but those living in the high mountains are encouraged and enabled to come down to the tent camps. The Government plans to set up tent villages in Punjab and in the non-affected parts of the NWFP in the short term. Many affected people seem to be reluctant to leave their areas, since their livelihood (land and livestock) is not only severely disturbed by the earthquake destruction but also by their displacement. In some cases, male household members are reportedly bringing their wife and children to the relief camps while they return to their village to protect whatever possessions they have left or finish the preparations for the winter in terms of fodder collections, tending to surviving livestock and so forth. Most families are likely to remain in the relief camps for an extended period (at least during the winter) and their needs should be assessed and responsibilities for their continued support clearly assigned.

11. **Organization of the relief effort.** The relief effort was from the beginning spontaneous and sporadic, but after a couple of days both local and international NGOs and the Pakistan Army became involved in more organized relief efforts. NGOs/CBOs are a comparatively recent phenomenon in AJK and not very well established in the affected districts of NWFP, either. A majority of these organizations have been formed/registered in the 1990s and are of religious nature like madaris (religious schools), while others are mostly welfare oriented. Most relief camps are presently organized and run by the Army, but it will be necessary to transfer the administration to relief agencies as soon as possible as the Army does not have the experience or capacity to handle the urgent relief and protection issues.

12. During the first weeks of rescue and relief efforts, relief in the more distant areas was provided either through air drops or through scattered distribution centers in the mountains, where women, old, disabled and other vulnerable and physically weak and less mobile groups were unable to compete in the frequently uncontrolled rush to access aid. Moreover, the aid agencies do not have any record of the numbers of women and children in any particular locality and are thus unable to target them. It is essential to set up special desks at all distribution centers for women/girls and other vulnerable groups.

13. International experience shows that protection of women and children is frequently violated under disaster and conflict conditions. Considering the prevalent social norms, it is important that the privacy for women and girls in connection with washing and changing clothes, breast feeding children and sanitation facilities should be ensured for the displaced women and girls. Pregnant women in the camps should also be ensured access to reproductive health care in view of the potential effects which the psychological and physical strains will put on their maternal health. There is also a need to raise awareness in camps of the risks of sexually transmitted diseases, such as HIV/AIDS.

14. **Legal aspects.** Most of the population of the affected areas owned a small plot of land (less than 2 ha). The land records system is centered on the Patwari who knows the ownership of every parcel of

land, and copies of Land Records are maintained in several different offices and should thus be recoverable in case of loss. However, many areas have been affected by land slides and changing the topography and rendering identification of land plots impossible. This may cause difficulties during rehabilitation stage, if land ownership becomes a condition for provision of house reconstruction grants. However, a number of households may have held customary tenure rights, which in case of the titleholder's death may prove difficult to transfer to legal heirs.

15. Widows' and daughters' inheritance rights are defined according to Islamic Law as a certain share of male inheritance rights, but in many rural communities, women customarily relinquish their claims to the joint family property. In the present situation, where traditional mechanisms of social support may be destroyed, the risk of widows and female orphans losing their rightful inheritance is considerable, especially since they may be unaware of the procedures to be followed to ensure legal possession of the land they are entitled to inherit.

16. Restoring lost records of property rights to housing, commercial property, and land should be launched as soon as possible, with special assistance given to the poor, squatters, widows, and orphans in demonstrating legitimate property rights.

17. ***Involuntary resettlement.*** Relocation of households and communities may take place where specific, severely affected locations are declared by authorities as too high-risk to allow further settlement. A measure of voluntary resettlement may also be expected in places affected by major land slides, or where affected people have either been squatting or were renters.

18. Apart from these situations, relocation should be avoided where possible, and assistance should, to the maximum extent, be given to enable people to rebuild their homes to better standards in their old location. This would minimize the need for new land acquisition, which may constitute hardship for those affected by losing land or livelihood opportunities. If land acquisition or displacement of people for new housing or infrastructure is unavoidable, a social assessment process involving all stakeholders should be undertaken.

RECONSTRUCTION AND RECOVERY NEEDS

Immediate Needs

- ***Provision of shelter and food.*** Provision of temporary shelter and food for affected people need to be addressed urgently in view of the onset of winter: (i) *Individual construction of temporary shelter* in situ in the affected areas, where special precaution should be taken to ensure outreach to women, the elderly, and other vulnerable groups with limited mobility. Material support and guidance (technical, location) should be given to individual households with the ability to erect temporary shelter for themselves; and (ii) *Extended stay in relief camps*, to bring people safely through the winter.
- ***Protection of vulnerable groups.*** Immediate initiatives should be taken to ensure the physical security of women and children in the temporary camps and shelters. In case of separated children, family reunification efforts have highest priority, and for orphans, culturally-sensitive interim and alternative care options need to be provided. Special attention should be paid to ensuring the inclusion of the disabled, the elderly, and other vulnerable groups in the relief efforts. Psycho-social support and legal protection should be provided through local capacities. Awareness raising and training on child rights and child protection should be carried out targeting all concerned actors.

- **A social assessment** should be undertaken to provide sufficiently detailed information about affected population (gender disaggregated data, number of orphans, permanently disabled, livelihood data) to design recovery efforts in accordance with the specific needs and requirements.
- **Coordination among agencies and actors** in relief and rehabilitation efforts to ensure full coverage and technically and socially sound outcomes.

Longer Term Recovery Needs

- **Housing.** Housing assistance packages should be developed based on principles of community consultations and household-driven reconstruction as well as minimum relocation. Community Based Organizations (CBOs) may facilitate the reconstruction process and the interface between households, local governments and locally-based building contractors and suppliers
- **Livelihood.** A comprehensive package (grants/loans/microfinance) should be developed to assist affected households in recovering their lost assets and means of livelihood. Single-headed households will need extra support in re-establishing livelihoods, and a certain proportion of households may need support in creating new livelihoods. Community-based approaches may be used to reach the largest number of beneficiaries as soon as possible to reduce dependency effects. Careful targeting of the most vulnerable groups, including the high proportion of female headed households and permanently disabled, should be undertaken. Sending single women (widows, young orphaned girls) to the Darul Aman (women's shelter run by the Government) should not be considered an option. Efforts to utilize local resources and employ local people in the rebuilding activities, including public works programs related to local recovery activities, should to the extent feasible provide local employment opportunities to the most needy.
- **Legal rights.** Action to restore lost records of property rights to housing, commercial property, and lands should be launched, with special assistance given to the poor, squatters and widows and orphans in demonstrating legitimate property and inheritance rights. Special attention should be paid to protection of women's and children's inheritance right to land and property, and administration hereof by legal guardian until the child reaches maturity.
- **Disabled.** A high proportion of the injured people will be permanently disabled. Exact numbers are not known yet, but measures will need to be planned, to cater to the specific needs of this group, including counseling, medical care (to enable them to function with their limitations), and support to achieve social inclusion and to ensure disabled children access to education. Some of these measures need to be taken in the immediate future and others in the medium term.
- **Community participation** will be essential in most sectors for the success of the reconstruction efforts and it is essential to preserve existing social networks which form the basis of support and mutual aid among the affected households. Local communities will need to be actively involved in the decision-making for and implementation of reconstruction activities, including decisions about rebuilding *in-situ*/relocation, housing, location of and types of services and so on. Examples of successful implementation of schemes through community participation are Rural Water Supply Project and Community Infrastructure and Services Project.

ANNEX 6 – ENVIRONMENT

A. Introduction

1. The earthquake hit an area of extreme environmental vulnerability within Pakistan. The earthquake-affected areas in the North West Frontier Province (NWFP) and Azad Jammu and Kashmir (AJK) are located in the Himalayan mountain range. The ecology of the area can be described broadly as being Himalayan moist temperate and Himalayan dry temperate zones. The area is covered with pine and broad leaved trees and is rich in natural resources and biodiversity. Forests, game reserves, rivers with low water temperature, lakes and wetlands characterize the landscape. Around 4 percent of the land area in AJK has been declared as protected area. The Machiara National Park is located in the heart of the earthquake affected area. In NWFP, about 6% of the land area is designated as protected, with the Ayubia National Park located at the periphery of the earthquake affected zone. The two main rivers in the affected area in AJK are the Neelum and Jhelum rivers, while the Kunhar river falls within the affected zone of NWFP. As a result of the steep terrain and excessive deforestation, landslides are a regular occurrence. Urban development has generally occurred with little or no environmental controls and a high proportion of the population lives in shelters and neighborhoods with virtually no basic services and facilities like clean drinking water and safe disposal of liquid and solid wastes.

2. The mission team visited the affected districts of NWFP and AJK and consulted with federal, provincial and regional government officials involved in environment and natural resource management as well as NGOs and international organizations that have been working on conservation issues in the affected areas.

B. Damage Overview and Recovery Needs

3. Although the dominant losses from the earthquake were to humans and structures, this event has also resulted in adverse impacts on the environment. Examples are flora and fauna damaged as a direct result of the earthquake and its numerous aftershocks, shifts in land surfaces, and alterations in local hydrologic systems. However, losses to ecosystems and environmental assets are very difficult to estimate. There are no rapid assessment methods available to quantify the environmental or ecosystem losses that result from earthquakes or other natural disasters without detailed surveys, because ecosystem impacts are not evident in the immediate aftermath of the event. Therefore, a qualitative assessment of the environmental and ecosystem impacts has been attempted at this stage.

4. **Debris and rubble disposal.** The most visible consequence of the earthquake is the enormous amount of debris and rubble resulting from damaged and destroyed structures. Disposal of rubble in rural areas, where structures are constructed of mud (*kaccha* houses) and stones (*pucca* houses), presents a different challenge than in urban areas, given that the amount of rubble is much less than in urban areas and it is spread out, making the task more complex. Considering that there will be large quantities of material that can be salvaged for reconstruction, the disposal problem is far less significant than in urban areas. There was evidence of haphazard dumping of debris and rubble in rivers adjacent to the cities. This has serious environmental consequences, not only to water quality, but for clogging of waterways with potential downstream flooding impacts. In addition, there were signs of debris/rubble being disposed of alongside roads, in open fields and drainage ditches, and forested areas. This practice of uncoordinated and unauthorized dumping should be stopped immediately and a more systematic and planned approach adopted.

5. It is virtually impossible to make accurate determinations of the amount of material requiring disposal at this stage. However, based on data from similar disasters and a preliminary assessment of the

structural damage conducted by AUSAID, it is estimated that the amount of debris and rubble resulting from damaged structures could be as high as 200 million tons.

Urban Environmental Issues

6. ***Sewage and wastewater collection and disposal.*** There were no proper sewage and wastewater collection and treatment systems in any of the urban areas affected by the earthquake, except for a sewage collection system in Muzaffarabad. The cities of Bagh, Rawalakot and Balakot did have systems of rudimentary wastewater collection in open drains. These systems have suffered structural damage and may need rehabilitation (see Water and Sanitation Annex). Untreated sewage was discharged into surface water bodies in most areas. While this practice had significant adverse public health impacts, the situation has been further aggravated by the earthquake.

7. ***Solid waste management.*** Since municipal solid waste (MSW) disposal sites in the affected areas were uncontained “open dumps”, the earthquake would not cause any incremental environmental pollution. But the large amounts of relief supplies in the affected areas have resulted in waste that needs to be properly managed. In addition, medical waste from hospitals poses a potential health hazard.

8. ***Underground storage tanks.*** It was estimated that 10,000 liters of petroleum fuels contained in underground storage tanks have leaked due to the earthquake. Such leakage could result in soil contamination and eventual pollution of groundwater. Monitoring may be needed to assess potential groundwater contamination. Since the main source of potable water and irrigation water is from surface sources, this impact may not be significant.

Natural Environmental Issues

9. Damage to ecosystems as a result of earthquakes is often less dramatic than structural damage. Due to the relatively slower manifestation of ecosystem damage, the practice in many affected countries has been to neglect undertaking complete environmental impact assessments of earthquake damage to ecosystems, beyond the immediate reconstruction needs. Considering that the earthquake affected areas are in fragile mountain ecosystems and were environmentally vulnerable even before the earthquake, it is critically important to undertake such an assessment.

10. ***Impacts due to landslides.*** The main environmental impacts from the earthquake to the natural environment were the result of landslides which resulted in impacts to: (i) the topography/morphology of the surface of the earth; (ii) rivers, streams, forests and grasslands; and (iii) habitats of native fauna and flora both on land and in the streams and rivers. The topography/morphology of the affected areas continues to be modified by aftershocks, some large enough to be considered earthquakes rather than tremors. The landslides resulting from the earthquake have altered the characteristics of mountain slopes and drainage basins. However, quantification of the extent of environmental damage will not be possible without a detailed analysis of high resolution imagery, yet to be obtained. The exposed soil surfaces appear to be in a state of dry equilibrium at present. However, a second phase of landslides is likely with the onset of the rains and spring snow melts. Until a detailed survey is conducted, the cost of measures to stabilize exposed surfaces cannot be estimated. Additional resources may be required to address the additional damage to the environment, infrastructure and livelihoods caused by this anticipated second phase of landslides.

11. ***Impacts of landslides on stream and river environments.*** The landslides triggered by the earthquake and its associated aftershocks have adversely affected streams, rivers and other water bodies. The debris flows have had a significant impact on the distribution of sediments in stream and river channels, either by depositing sediment in the water channels or by transporting sediment farther downstream, often to great distances. In addition, they have contributed to partial blockage of channels,

local channel constriction below the points of landslide entry and may even have shifted channel configuration or blocked streams altogether. Increased sediment could also result in channel scour, large scale re-distribution of bed-load gravel, and accelerated channel erosion and bank undercutting. Communities have mentioned that there have been disappearances of some streams and new appearance of others. While these issues will have significant localized impacts on water quality and quantity and fish kills, which will affect communities and livelihoods, increased sediment transport will also contribute to accelerated siltation of the Mangla reservoir. Monitoring sediment transport and other adverse impacts, particularly during the spring snow melts, and taking necessary remedial measures is critical for sustainability of livelihoods of the local community. Wider economic impacts may result from reduced storage capacity at the Mangla reservoir.

12. **Impacts on forest cover and wildlife.** Large parts of the earthquake affected area have been denuded of forest cover over the last few decades as a result of encroachment, illegal timber felling, and agriculture. Therefore, the mountainsides have been vulnerable to landslides. The earthquake exacerbated an already bad situation with regard to forestry losses. Stripping of forest cover by landslides was visible, but not extensive and available satellite imagery was unable to quantify the extent. Large expanses of forest cover seemed undisturbed by the earthquake although trees may suffer damage during major earthquakes due to shaking or faulting of their substrate, which is not initially visible. Such damage may result in temporary asymmetric growth and/or reduction in the width of annual growth rings.

13. The greatest impact is likely to result from a 200-300% increase in timber demands for reconstruction. Although there is a ban on logging, the practice continues unabated. Unless there are proper controls in timber extraction so that it is sustainable, there can be a wave of denudation of forests. Lack of proper housing will lead to increased fuel wood demands for heating although traditionally, only branches are lopped for fuel wood. It is not possible to quantify these demands at this point due to a lack of demand data. In addition, potential for future landslides due to the instability of the hillsides may have serious implications to the sustainability of forest resources. With respect to wildlife, although most kinds of wildlife are able to retreat fast enough to prevent injury from all but the fastest moving landslides, all creatures are subject to landslide-caused habitat damage and destruction, the extent of which is unknown. Fish were probably the most affected because they depend on stream access and water quality for their survival, both of which have been adversely affected by the earthquake.

C. Reconstruction and Recovery Strategy

Approach

14. In developing a strategy for reconstruction and recovery, environment should not be considered as a separate sector because it is intricately linked to livelihoods of the affected communities because of their dependence on natural resources. In order to ensure the sustainability of the reconstruction and recovery process, environment and natural resource issues have to be an integral part of all sectoral plans, particularly on the transport, urban development and water supply and sanitation sectors. As a general rule, 3-7% should be added to overall sectoral costs for integration of environmental mitigation and management measures. While the country had little control over the adverse environmental impacts resulting from the earthquake, it will have complete control over the environmental and natural resource impacts of reconstruction.

Critical Issues

15. The most pressing environmental issues that need to be addressed are: (i) disposal of debris and rubble; (ii) sanitation, public health and solid waste disposal issues arising from the transitional housing camps of affected persons to ensure that public health and the surrounding environment will not be adversely affected; (iii) immediate identification of alternative building construction material, where

feasible, and identification of suitable resource extraction sites for housing material; and (iv) undertaking studies to quantify the ecological damage due to the earthquake and recommend mitigation/remediation measures for reversal, wherever possible.

Short-term Priority Actions

16. ***Disposal of rubble and debris.*** The most significant and immediate environmental management problem faced as a result of the earthquake is proper disposal of up to 200 tons of debris and rubble created from destroyed structures. A rubble and debris management plan is urgently needed which will have appropriate guidelines for diversion, site identification and monitoring of removal; identification of temporary sites for debris that can be diverted by recycling (crushing concrete for aggregate) and reuse (for housing, particularly in rural areas); provision of diversion incentives; permanent sites for disposal; and management of wastes arising from reconstruction. With implementation of a proper debris management program, recent disasters have shown that around 25% of rubble could be recycled and reused. If adequate machinery for crushing concrete to for aggregate is available, the diversion could be as high as 50%. As the unit cost of rubble removal, transport and disposal is around US\$ 1/ton, this would result in significant additional savings in disposal costs and also preserve the environment. *Estimated cost Rs. 8.91 billion.*

17. ***High resolution imagery analysis.*** Analysis of high resolution imagery so earthquake damage information for the studies is available. *Estimated cost Rs. 4.16 million.*

18. ***Identification of critical environmental and natural resource issues in the reconstruction and recovery program.*** Once the overall reconstruction and recovery strategy is identified by the Government of Pakistan, an assessment needs to be undertaken to identify the critical environmental issues, constraints and remedial measures to be integrated into reconstruction planning and implementation in order ensure sustainability of the program. *Estimated cost Rs. 2.0 million.*

19. ***Identification of resource extraction sites for sourcing building material for the reconstruction program.*** The reconstruction program will create demand for building materials such as timber, sand and quarry material (stones/rock) and clay. This could lead to haphazard sourcing of these resources creating irreversible environmental degradation, which could further increase the environmental vulnerability of the affected areas. Resource extraction sites need to be identified urgently to facilitate sustainable resource extraction with the requisite environmental safeguards. *Estimated cost Rs. 2.0 million.*

20. ***Ecological impact studies.*** The ecological impacts and losses due to the earthquake on forestry, aquatic and terrestrial ecosystems, including biodiversity need to be assessed and quantified so that remedial measures can be taken to restore damage. Land use plans for reducing vulnerability in the fragile mountain ecosystems is needed. Investments in ecosystem restoration cannot be made without detailed analysis. *Estimated cost Rs. 10.0 million.*

21. ***Short-term environmental monitoring.*** Short term environmental monitoring is needed to monitor water quality in the three main rivers and other environmental parameters in order to determine an action plan on improving environmental quality and addressing siltation problems in the reservoirs. *Estimated cost Rs. 10.0 million.*

22. ***Institutional capacity building.*** Capacity in environmental management institutions in AJK and NWFP will require strengthening to cope with managing environmental issues of the reconstruction program. *Estimated cost Rs. 30.0 million.*

Medium to Long-term Priority Actions

23. **Reconstruction of infrastructure of the forestry and wildlife sectors.** The forestry and wildlife sectors have identified the following losses to public infrastructure: (i) *Damaged infrastructure*: 2 Rest Houses; 1 Range Quarters; 1 Forest Quarters; 1 Officer Quarters (*Sub Total Rs. 1.6 million*); (ii) *Destroyed infrastructure* – 4 Rest Houses; 1 Range Office; 1 Residence; 1 Forest Quarters; 3 Forest Huts; 1 WL Hut; 5 Chowdika and Peon Huts (*Sub Total 18.5 million*). *Estimated cost for reconstruction is Rs. 21.0 million.*

24. **Investments in ecological restoration of the earthquake affected areas.** Based on the findings of the ecological studies proposed above, investments in ecosystem restoration will be needed. *A budget cannot be determined until the studies are completed.*

D. Environmental Safeguards

25. An Environmental and Social Impact Assessment and Management Framework will be prepared and will be used as a guide to undertake environmental impact assessments for all rehabilitation and reconstruction activities to ensure adverse environmental impacts are minimized and appropriate mitigation measures are included in project design.

Table 1: Environmental Needs Resulting from the Earthquake Disaster
(Rs. million)

Project Proposal	Short Term (18months)	Medium to Long Term (1-3 years)	Total (Rs.)
Disposal of Rubble and Debris	8,910.00		8,910.00
High Resolution Imagery Analysis	4.16		4.16
Identification of Critical Environmental and Natural Resource Issues in the Reconstruction and Recovery Program	2.00		2.00
Identification of Resource Extraction Sites for Sourcing Building Material for the Reconstruction Program	2.00		2.00
Ecological Impact Studies	10.00		10.00
Short-term Environmental Monitoring	10.00		10.00
Institutional Capacity Building	30.00		30.00
Reconstruction of Infrastructure Damages of the Forestry and Wildlife Sectors		21.00	21.00
Investments in Ecological Restoration of the Earthquake Affected Areas		Not Available until studies are completed	Not Available until studies are completed
TOTAL	8,964.00	21.00	8,985.0

ANNEX 7 – HOUSING

A. Introduction

1. The October 8, 2005 earthquake left an estimated 2.8 million people in need of shelter at the onset of a harsh winter, in a rural, difficult to access, terrain. GoP census data indicates that about 787,000 housing units were in the affected area, and that these were predominantly rural.

2. The typical home in the affected areas houses 6-7 persons, is 400 sq. ft. and consists of one or two main rooms, a veranda and a bath and kitchen which may not be attached. A *Katcha* (non-permanent) house will typically have mud or stone rubble walls with a flat mud roof supported on pole beams. A *Pucca* (permanent) house will have stone rubble or fired brick masonry walls with sand cement mortar and a low pitched sheet metal or reinforced concrete (RCC) flat slab roof. More recently, hollow cavity concrete masonry unit (CMU) block is being used for walls. Virtually none of the housing in affected areas has seismic consideration in design. Compounding this is the generally poor quality of construction.

B. DAMAGE OVERVIEW AND RECOVERY NEEDS

3. Data as of November 9 indicate that, for the affected areas in AJK and NWFP, 203,579 housing units were completely destroyed, while 196,574 were damaged to various degrees. These include 116,572 and 88,368 respectively in AJK and 87,007 and 108,205 respectively in NWFP, and represent 84% of the total housing stock in the affected districts of AJK, and 36% of NWFP (Table 1).

Table 1: Summary by Province of Total, Destroyed and Damaged Housing Units

District	% Urban	Total Units	Destroyed	Damaged	Total Damaged	Total Damaged %
<i>AJK Affected Districts</i>						
Muzaffarabad	12	123,679	69,943	28,278	98,221	79
Bagh	5	59,623	33,806	21,208	55,014	92
Poonch	11	61,678	12,823	38,882	51,705	84
AJK Total	10	244,979	116,572	88,368	204,940	84
<i>NWFP Affected Districts</i>						
Shangla	0	67,003	15,661	10,821	26,482	40
Mansehra	14	203,109	31,323	43,282	74,605	37
Kohistan	0	74,087	4,350	18,395	22,745	31
Abbottabad	19	153,819	6,961	27,051	34,012	22
Batagram	0	44,585	28,712	8,656	37,369	84
NWFP Total	11	542,604	87,007	108,205	195,212	36
AJK + NWFP	10	787,583	203,579	196,574	400,153	51

4. The total value (replacement cost, not depreciated) of the housing in the affected areas is shown in Table 2, and is Rs. 119 billion. These values were determined based on a typical building plan and unit material and labor costs. Material quantities and construction costs were estimated for the value of *Pucca*, semi-*Pucca* and *Katcha* houses, as they existed prior to the earthquake. These values were multiplied by the pre-earthquake housing stock, to estimate exposed value.

5. A similar methodology was employed to estimate loss of value due to destroyed and partially damaged housing. For partially damaged houses, 20% of the cost of a new house was used as the average cost of repair, it being an average of the range of houses which would require repairs (i.e., average of no damage, and 40% damage – houses damaged in excess of 40% were classified as destroyed). Results are indicated in Table 2, which shows that the earthquake destroyed Rs. 61.2 billion of this value, or 34% of the exposed value.

Table 2: Estimates of Housing Values – Total, Lost and Reconstruction

(Rs. millions); (US\$ millions)	Total Housing	Value of Lost Housing (as-was)			Reconstruction Cost (400 sq ft) Seismic design		
		Destr.	Dmg*	Total	New	Repair	Total
AJK Affected Districts	32,000	22,107	3,401	25,509	34,971	7,070	42,041
NWFP Affected Districts	87,000	20,407	5,102	25,509	26,102	8,660	34,759
BOTH PROVINCES (Rs. millions)	119,000	42,514	8,503	51,017	61,073	15,730	76,800
TOTAL including 20% contingencies		51,017	10,203	61,220	73,289	18,871	92,160
US\$ millions	2000	859	172	1,031	1,234	318	1,552

Cost estimate basis: for reconstruction = Rs. 750 per sq ft; for repair = Rs. 200 per sq ft.

* Excludes value of household contents such as consumer durables

6. The reconstruction costs were estimated at Rs. 92 billion (of which Rs. 73 billion for new houses) if replacement houses were 400 sq ft and of seismically acceptable structural standards. A 20% additionality for contingencies, under-reported damage and unforeseen expenses was also reflected in arriving at the totals. Details of these designs are found in Notes 1 and 2 at the end of this annex. These designs have been used for costing purposes. Other structural design options may also be considered subject to their seismic appropriateness, affordability, and availability of local building materials.

APPROACH TO HOUSING RECONSTRUCTION

7. The approach that follows outlines 9 principles based on international post-disaster reconstruction experience and consideration of the Pakistani context.

Principle 1: *Promote hazard-resistant construction standards and designs.* The collapse of approximately 200,000 buildings, predominantly housing, was due largely to the lack of any seismic consideration in their design and their poor quality of construction and maintenance. Reconstruction of affected areas should emphasize seismic safety.

Principle 2: *Rebuild in-situ.* Most households should be allowed to rebuild on their original plot of land. This in-situ approach minimizes:

- resistance of the population at attempts at relocation
- demands on GoP to sustain livelihoods in new locations and to build new physical and social infrastructure.
- demands on, and costs to, the GoP to identify and acquire land and issues of land ownership and availability

Principle 3: *Ensure rebuilding is owner-driven.* Homeowners should be in charge of rebuilding of their own homes.

Principle 4: *Rebuild with familiar methods and easily accessible materials.* To be sustainable, promotion of hazard resistant standards and designs must relate to use of readily available materials, familiar modes of construction, and cultural preferences in design.

- Principle 5:** *Relocate settlements only when necessary.* Relocation of some settlements might be inevitable. These should be limited to circumstances where the risks of exposure or contributory effects to hazards remain very high due to topography; soil conditions and other environmental and risk factors.
- Principle 6:** *Ensure urban replanning is limited and strategic:* Such attempts should not be city-wide but instead focus on pockets of strategic urban areas.
- Principle 7:** *Offer uniform assistance package that is not compensation-based.* Compensating households proportionate to the replacement value of their loss increases the GoP's liability significantly and encourages a plethora of litigation.
- Principle 8:** *Coordinate multiple reconstruction initiatives and standards for equity.* It is crucial that the GoP coordinates multiple reconstruction initiatives to ensure full spatial coverage and reduce the risks of beneficiary double counting or any affected household being missed.
- Principle 9:** *Link housing to livelihoods and infrastructure rehabilitation.* The sustainability of housing solutions offered by the GoP will be largely determined by complimentary efforts to restore livelihoods and rehabilitate physical and social infrastructure.

C. RECOVERY AND RECONSTRUCTION STRATEGY

8. The suggested recovery and reconstruction strategy comprises a variety of activities and modes of assistance aimed at helping households transition from their current state of displacement to being re-housed in permanent housing of seismically acceptable standards. Many of these options will operate in parallel as households have a continuum of needs and are not all starting at the same point. The predominant form of suggested assistance is cash grants for owner-driven rebuilding – a mode well suited to the 90% rural affectees. This would be responsive to individual preferences and maximize household ownership thereby keeping expectations of, and demands on, GoP realistic. Simultaneously it would mobilize tens of thousands of mostly self-standing reconstruction and rehabilitation efforts, thereby not burdening GoP administrative capacity with a large volume of contract management. The objective of the grant would be to either replace a destroyed house with a new core unit, or to repair a damaged house. Urgent attention to beneficiary identification and eligibility levels is required, and assistance packages need to be few and standardized. The strategy also identifies the need for extended-term intermediate sheltering options for households, particularly from pockets of urban areas, who will need to be relocated. Although permanent relocation will require time, replacement site identification and replanning are short term priorities.

Sheltering of Affected Population

9. **Tents.** A major effort at providing tents and blankets to affected households by the GoP continues in conjunction with various UN organizations, NGOs and donors. The majority of tents available are more suitable for the lower altitudes. In towns, people may be able to use their moderately damaged houses for cooking and storage while sleeping in the tents. Households who wish to pitch their tents on their original plots should be allowed to do so. Distribution of plastic sheeting in parallel supports the families to protect from rain and cold.

10. **Distribution of basic building materials and tools/cash.** There are already some signs of affected households recycling building materials such as GI roofing sheets and timber from their damaged houses for sheltering themselves for the winter. Supporting this option by distributing materials and the necessary tools in quantities equivalent to producing a very basic shelter is preferable to tent solutions,

particularly at altitudes above the snow line. It allows families to stay in the same locations, and utilizes their labor, cash and salvaged materials for an immediate shelter solution. Durable, recyclable materials have the advantage of being phased into more permanent structures later on either through dismantling and reusing them or by expanding them. Alternatively cash may be given to the affected households to purchase these materials.

11. **Cash for self relocation and host families.** There is evidence from NGO reports that some families have taken refuge with relatives in other locations. A cash grant support to those families willing to relocate themselves for the winter can accelerate this process and reduce the need for shelter in the winter. Some subsistence support could also be considered for the families prepared to host others.

12. **Relocation to camps/transition shelter.** Thousands of dispersed villages cannot be serviced easily in the winter. On a strictly voluntary basis, some villagers could be encouraged to temporarily relocate to nearby camps that are being established in conjunction with the Army, UN organizations, and the NGOs/CSOs. Existing social and physical infrastructure of towns (even where there is some physical damage) can be fixed more easily than creating new facilities. Shelter solutions will be easier and quicker to deliver and service in ‘hubs’. This will require bolstering the capacity and number of camps. Transition shelter options will be required in these sites for those households who need to remain there beyond the winter because their original settlement sites are being subject to replanning/land consolidation, or because they have to be relocated all together. These longer-term inhabitants would require arrangements for provision of services as well as access to livelihoods.

Repair and Reconstruction of Permanent Housing

13. **Determining loss and eligibility levels.** A detailed assessment of loss and damage to housing assets needs to be undertaken as soon as possible so that assistance packages can be developed using transparent eligibility criteria. Moreover, it will also provide comfort to homeowners to begin self-repair without concerns of not getting legitimate compensation for losses incurred. Teams of engineers from the public and private sectors will need to be identified and trained in assessment techniques and criteria, and the surveys conducted during the upcoming winter season, when reconstruction/repair activity would be minimal. The preparation of an accurate list of reconstruction beneficiaries, following a rapid but thorough housing damage assessment and social verification, is an urgent task. The large number of affected households will require it to continue on an ongoing basis. In order to consider the social and political sensitivities within the concerned Districts, village/community participation in the selection and prioritization processes is crucial.

14. **Seismic, soil and other site investigations.** Detailed studies need to be undertaken to identify land susceptible to future natural disasters like earthquakes, landslides, and erosion/settlement. Rebuilding on original plots in these areas will clearly be ill-advised due to serious future risk to property or life. Other studies of some urban centers where the opportunities for, and potential benefits of, land consolidation are high should also be conducted. These activities will need to be undertaken in parallel with identification of possible sites for needed relocation.

15. **Training for safe construction.** Training in seismically appropriate construction for artisans, contractors, home-owners, and construction supervisors should be an integral part of GoP’s reconstruction strategy. This training should be initiated as soon as possible, and be repeatedly provided on an ongoing basis throughout the reconstruction period. Assistance for permanent housing will need to be tied to the adoption of the improved practices. With the scale of devastation and loss of life fresh in the minds of so many households, there is a unique window of opportunity to gain buy-in for these changes. It is suggested that prevalent construction materials be used as far as possible to avoid the time lag that is created by introduction of radically different ones. This also maximizes recycling of materials and

thereby reduces costs and speeds up recovery. Where necessary, alternate emerging technologies may be adopted only after thoroughly tested for their safety, acceptability, and replicability.

16. **Information Dissemination.** A crucial part of the GoP’s strategy should be effective and widespread consultation and dissemination of information to the affected communities. This should include information on the full range of assistance options, their eligibility criteria, and the means of accessing them, as well as on improved construction methods for seismically safe houses.

17. **Cash grants for Permanent, hazard-resistant basic housing assistance.** The core of the GoP’s assistance to affected households in both urban and rural areas should be cash grants for basic housing assistance. The grants should be released in tranches based on stages of construction, with technical assistance for introduction of seismic features provided by local governments and/or provincial line agencies. There should be few categories of grant so that their administration is simple. In this scheme, households will be able to utilize their own labor, use hired labor, or enter into an arrangement with a partner organization/NGO to rehabilitate or reconstruct their houses. However, close monitoring of reconstruction processes adopted will be crucial.

18. **Urban planning and development.** While the earthquake has been a terrible disaster for all six towns in the affected areas (four in AJK and two in NWFP) it also presents an opportunity to properly plan, reshape and rebuild parts of these towns into modern efficient communities. Also in some cases the original nature and intensity of the land use in relation to land prices was highly inefficient. Under normal circumstances, improving the towns would be difficult as various vested interests would resist change, but in the aftermath of the earthquake residents may be amenable to change. These efforts for the most part should not be city-wide but instead focus on localized pockets of urban areas.

19. Reconstruction of urban infrastructure is one of the most complicated aspects of disaster rehabilitation and reconstruction. This requires up to a year of time to prepare proper plans, maps, and land use/zoning bylaws, followed by design/tendering, and construction of infrastructure. Often old town areas have to be redesigned to allow for access and utilities, this in turn requires land acquisition and provision of alternate land, if available. The new development plan then has to be legalized in the normal process. To be successful, this should follow a consultative process with stakeholders and will need to be governed by explicit legislation or regulation some of which may be in the form of Government Orders.

D. ENVIRONMENTAL AND SOCIAL ASPECTS

20. The main environmental risk remains the threat of over-exploitation of building materials including timber and stone which may be conveniently located but serving vital environmental functions such as slope stabilization and soil protection. Since strict policing of a highly dispersed owner-driven process would be difficult, widespread public education programs on the risks posed by these practices and others such as clearing of rubble into river courses would be required, together with measures to ensure adequate supply of suitably sourced materials.

21. Loss of land records, depending on extent, can also be a significant source of social risk associated with housing recovery. Initial assessments suggest that none of the District Revenue Offices in the eight affected districts has been damaged to the extent that the land records cannot be salvaged intact. They will however need to be retrieved quickly, before the winter rains and snow arrive and cause their deterioration.

22. Where records have been lost and are not retrievable even through backups, other community-based evidence mechanisms will need to be deployed for re-mapping of parcel boundaries, certification of redefined boundaries; landlord/tenant claims; previously unregistered land; allocation of community land; identification of rightful heirs; and claims of informal settlers.

23. Affected persons in the areas that require re-planning will need longer term sheltering with reasonable access to basic facilities, as their house reconstruction has to wait for the planning process to be completed. Since most small cities and towns do not have the capacity to initiate and implement such major activities, additional institutional capacity will be needed.

24. Site selection and intra-site household dislocation, when settlement relocation or land consolidation is deemed the appropriate course, are key junctures in managing potential social and environmental risks associated with housing recovery. Such efforts should be voluntary with incentives favoring relocation. Access to livelihood and provision of social and physical infrastructure should be an integral part of relocation plans. Where relocation takes place near existing settlements, impact on the 'host' community should be considered. A useful way of attempting to mitigate these risks would be to have these processes formally overseen by a multi-party tribunal.

25. Finally, affectees residing in relatively inaccessible areas or belonging to socially disadvantaged groups will be at a risk of being left out and not benefiting from the compensation packages. A concerted effort will be needed to avoid this from happening.

Technical Notes

Note 1 The retrofit conceptual designs basically consisted of (a) for the *Katcha* house: Remove the mud roof; Install reinforced concrete frame (RCC columns with spread footings and perimeter bond beam) interior to the mud or stone masonry walls; install welded wire mesh (WWM) on both faces of the walls, anchored around its perimeter to the bond beam and columns, and intermittently field anchored. Cover the WWM with a cement mortar plaster (and point if stone masonry); install new Tin roof; and (b) For the *Pucca* house: without removal of the existing Tin or RCC roof, install RCC columns with the existing wall, by saw cutting or hand removal of the masonry. Remove top course of the wall and cast a bond beam integral with the columns; for rubble stone masonry walls, WWM may be required as for the *Katcha* House (this needs to be examined further). For fired brick masonry walls, the masonry is infill to a concrete frame, and does not require WWM facing. Point the brick or stone masonry with cement mortar.

Note 2 For houses that had been totally destroyed, the conceptual design for a replacement house was developed, consisting of a RCC frame (i.e., columns and bond beam) with ladder reinforced stone masonry or brick infill, with a tin or flat slab RCC roof. The same cost was used whether urban or rural housing, on the assumption that rural housing owners will have higher costs for materials transport compared with urban owners, and will compensate by using lower cost locally available stone masonry.

ANNEX 8 – HEALTH

A. Introduction

1. The health delivery system in NWFP and AJK is comprised of both public and private sector providers, with the private sector mainly limited to urban centers. The public sector provides services through a four-tiered network of facilities and community based workers operating from their health houses. Health outcomes and sector performance in AJK have been comparatively better in comparison with other Provinces of Pakistan (with lower levels of infant mortality, higher immunization and antenatal care coverage). The affected Districts (other than Abbottabad) in NWFP have a much higher IMR and under-five malnutrition levels than the national and provincial average. In addition, the health sector utilization is low in the affected Districts (except Abbottabad) as compared to other Districts in NWFP (Table 1).

Table 1: Selected health indicators for earthquake affected areas of NWFP and AJK ²²

Area	IMR per 1000 LB	ANC %	EPI % fully immunized	Utilization/Day of RHCs ¹	Utilization/Day of BHUs ²
National Average	77	50	77	80	28
NWFP	56	39	76	60	20
Abbottabad	72	36	68	60	9
Batagram	99	23	31	NA	9
Kohistan	104	2	52	NA	3
Manshera	71	36	46	33	8
Shangla	98	31	12	NA	7
AJK	56	40	86	46	18
Muzaffarabad	NA	NA	78	36	17
Bagh	NA	NA	92	33	18
Poonch	NA	NA	NA	69	18

¹ RHCs: Rural Health Centers.

² Basic Health Units.

2. **Consultations and site visits.** The assessment is based on a review of information made available by the Governments of NWFP and AJK, from district teams of the World Bank and ADB, and from the WHO/MOH coordination center. The team visited the affected area, interacted with the people, public and army officials, local and international NGO staff and development partners. The data used are preliminary and likely to change as information is still being aggregated. The assessment report was jointly prepared by experts from the WHO, UNICEF, KfW, ADB and the World Bank. The purpose of the report is to undertake damage needs assessment and outline a short term and medium to long term health sector recovery strategy.

B. Damage Overview and Recovery Needs

3. **Human impact of earthquake.** The earthquake has affected about 4 million people in the eight districts. Although number of deaths and injuries varies according to the source, the pooled average of the data indicates a loss more than 73,000 lives and another 70,000 plus injured, with 90% of deaths and injuries in Manshera and Batagram Districts in NWFP, and Muzaffarabad and Bagh in AJK. Disaggregated data in terms of mortality and gender, displaced, missing, widows, orphans and disability

²² Various sources including PLSM 2004/05, PIHS 2000/01 and MICS 2004.

due to serious injuries are not available, but these are likely to cause a significant social impact. With the approaching winter, inadequate shelter, poor nutrition and lack of access to essential health services, the vulnerabilities of the affected population, especially women and children, are likely to increase.

4. The immediate priority is to take care of the injured. An emergency response involving multiple partners including the Pakistan Army, Ministry of Health, UN agencies NGOs and local people is underway. Health care is being provided by medical teams and through establishment of 11 field based hospitals with international and local support. In addition, preventive health interventions have been initiated including immunization; vector control; vitamin A supplementation; and disease surveillance has been organized. Over 102,600 patients have been treated and or airlifted to 70 hospitals, in the earthquake neighboring areas. Over 27,700 operations have been performed on the referred patients with 784 reported deaths. About 211 amputations in Rawalpindi and Islamabad and another 500 plus in AJK and NWFP have been performed. Out of 23 reported cases of tetanus, only two have survived. The weakened management and human resource capacities at the district level and provision of health care by volunteer organizations and NGOs makes the task more challenging for health authorities to mount an effective and coordinated response. The likely withdrawal of the many volunteer organizations and individual volunteers from the affected areas will put an additional burden on the public system response.

5. **Damage to the health care delivery system.** Damage to the health sector has been severe, including destruction of health infrastructure. Muzaffarabad and Bagh Districts of AJK and Manshera and Battagram Districts of NWFP (Table 2) suffered the most in terms of destruction of health infrastructure.

TABLE 2: HEALTH INFRASTRUCTURE DAMAGE BY AFFECTED PROVINCE/DISTRICT

Area/Province and District	Number of health institutions/management structures			
	Fully damaged		Partially damaged	
	Urban	Rural	Urban	Rural
NWFP				
Manshera	3	32	1	18
Abottabad	1	10	1	25
Batagram	2	33	-	5
Kohistan	-	-	-	22
Shangla	2	11	1	18
Others	-	-	3	-
Sub-Total NWFP	8	86	6	88
Azad Jammu & Kashmir				
Muzaffarabad	12	90	8	-
Bagh	6	48	-	9
Poonch	5	200	1	7
Sub –Total AJK	23	338	9	16
Total	31	424	15	104

6. **Physical infrastructure damage.** The damage to public health infrastructure has been widespread, with 574 health facilities partially or fully damaged. Almost 75% of the first level care facilities have been either fully damaged or have suffered partial damage. The five District Headquarters Hospitals were completely destroyed, and the only tertiary health care facility in the region suffered structural damage. In addition, the smaller health units including Sub-Health Centers and First Aid Posts serving remote small mountainous hamlets have been destroyed. Information on Lady Health Workers (LHWs) and health houses are not yet available, but the number of health houses destroyed is likely to be proportional to the number of houses destroyed in the affected area. Besides the infrastructure, the majority of medical and office equipment, furniture, drugs and laboratories has been destroyed. Complete information on ambulances and supervisory vehicles is also not available, but 21 vehicles and 6 motorcycles have been reported destroyed. In addition, official records, including the Health Management Information System (HMIS) data at the Director General Office in AJK and at the District level have been

lost. Information on the private sector is scarce; only 9 private health facilities including clinics and laboratories in Bagh, Balakot and Muzaffarabad have been reported destroyed.

7. **Loss of managers and health care providers.** Available information to date indicates that there have been 21 confirmed deaths while 141 staff sustained injuries including senior staff of the AJK Department of Health. There is incomplete information regarding the Lady Health Workers (LHWs) residing among the communities, and it is assumed that the mortality and morbidity among them would be proportional to losses in the population. Thus far, only two supervisors and 19 LHWs are confirmed dead. Field visits and discussion with relief workers indicate that many staff have lost both immediate or close family members and homes. Surviving staff in the affected areas are slowly returning for duty, possibly due to psychological trauma. Many are busy finding shelter for their families, or helping them to rebuild houses. But most are still too weak, both physically and mentally, to deliver health care.

8. The above losses have resulted in a complete breakdown of the health system with disruption of the provision of both secondary and primary care services, including immunization, services provision by LHWs and TB DOTS services. In addition, health management at the central level in AJK, District, and at the facility level was paralyzed. Most official and health management information records and systems were lost.

TABLE 3: SUMMARY OF DAMAGE TO HEALTH CARE SYSTEM IN THE AFFECTED AREAS

Type of Health Institution/Offices	Number Fully Damaged	Number Partial Damaged	Estimated Replacement cost in Pak Rs in million
Tertiary Care Hospital	-	1	500
Secondary Care - District, Tehsil Headquarters and Civil Hospitals	16	13	6,678
First Level Care Health Facilities (RHCs, BHUs and MCH Centers)	203	68	8,091
Other Health Facilities(Dispensaries, First Aid Posts etc)	219	34	159
Health Management Offices	17	3	318
Total Health Facilities	455	119	15,866
Loss of vehicles/motorcycles	21/6	-	22
Total			15,888

9. **Damage assessment and costs for reconstruction:** Based on the available information, the estimated damage to the health sector is estimated at approximately Rs. 7,114 million (Rs. 2956 million in NWFP; and Rs. 4158 million in AJK) (Table 4). This includes damage to medical equipment, furniture and vehicles. The cost of replacing the damaged infrastructure (including new construction and repairing damaged buildings, and replacing equipment and furniture) has been estimated approximately at Rs. 15,888 million (Rs. 5,273 million in NWFP; Rs. 10,614 million in AJK) (Table 4). These estimates are likely to be understated as they do not include estimates of damage to private health care. In addition, indirect losses due to expenditure on treatment of survivors, public health interventions, loss of health staff and the impact of psychological trauma have not been computed. Total health sector needs, including new interventions and replacement of damaged infrastructure, amount to Rs. 18,013 million.

**Table 4: Health Sector - Damage Assessment and Reconstruction Costs
(Rs. Million)**

	Damage ²³	Construction Cost	Seismic multiplier	Total Construction Costs	Total furniture/equipment/Vehicles	Total Reconstruction Costs
NWFP						
Completely Damaged	1,542	2,820	1.05	2,961	708	3,669
Partially Damaged	1,404	1,151	1.20	1,382	211	1,593
Vehicles	11	0		0	11	11
Sub-total	2,956	3,971		4,343	930	5,273
AJK						
Completely Damaged	3,051	6,621	1.05	6,952	594	7,546
Partially Damaged	1,097	2,432	1.20	2,918	139	3,057
Vehicles	11	0		0	11	11
Sub-total	4,158	9,053		9,870	744	10,614
Grand Total	7,114	13,024		14,214	1,674	15,888

C. Reconstruction and Recovery Strategy

10. **Overall approach and key principles for reconstruction strategy.** The Government of Pakistan is preparing an overall national plan of action for reconstruction and recovery for all sectors, including health. It is imperative that this strategy encompass the Humanitarian Charter for minimum standards for health care, including the right to health and respect of the dignity of the population affected by the disaster. The strategy should be constructed on the key principles of *equity, access to essential health care, timeliness, results and accountability*. It should also ensure placement of strong local leadership, strategic coordination of the effort, building local capacity, and reinforcing partnership with non government organizations and UN agencies which characterized the early phase of the emergency response. The strategy should also address the special needs of women and children who are the major clients of the health system, and the emerging needs of persons with disabilities and psychological trauma. The selection of priority health interventions should follow a careful review of the health status of the population and the performance of health services before the crisis, current needs, the gaps, existing capacities and new opportunities.

11. **Critical issues to be considered by the Government:**

- **Access to primary and secondary health care services.** Provisional data on property damage confirm large scale destruction of the health facilities, including the primary and secondary health care network. This in turn means the disruption of health services, leaving nearly four million people without access to primary and secondary health care. This situation does not bode well for a population with poor health indicators before the earthquake. It highlights the need to focus on ensuring access to essential primary and preventive health and secondary care as the system is rebuilt.

²³ Valuing asset damage on basis of its replacement cost.

- **Targeting populations with special needs.** Women and children are the primary users of primary health care services, representing 60-65 percent of the primary health care (PHC) clients before the earthquake and 70-75% of the reported deaths and injuries from the disaster. It is critical to ensure that services for management of acute respiratory infection (ARI) and diarrhea, antenatal and postnatal care is revitalized as a priority. The recovery strategy should address the needs of this population as well as the emerging needs of persons with disabilities.
- **Need for detailed needs assessment and mapping by each District** to assess health facility feasibility in terms of population movement and functional existing facilities and the emerging health situation.
- **Coordination of the relief and rehabilitation activities.** The earthquake relief effort includes 263 teams working in the field, including 11 field hospitals with unsynchronized timeframe for departure from the affected areas. It would be essential that an effective coordination mechanism is put in place to enhance the effectiveness of health interventions and the emergency efforts.
- **Health sector capacity.** The existing management of health sector is weak with inadequate capacity, especially at the district level. With staff already traumatized and looking for options to move to non-earthquake areas, it will be essential to mobilize health managers and health staff from other Provinces to work temporarily in earthquake affected areas.
- **Taking care of healthcare workers.** Health workers share the fallout of the earthquake with the rest of the population. The psychological impact of this is manifested in flight of health workers to areas less affected by the earthquakes, likely increased absenteeism from work, insomnia, or inaction. This would require close management attention and understanding besides counseling to help overcome the mental trauma.
- **Missed opportunities for health promotion and disease prevention.** Many of the affected people have contacts with the health sector, relief organizations, and the army. These contacts are seldom used for more than dressing a wound, exchange of blankets or bedding materials, or food drops. At the acute emergency phase wanes, these encounters should be used for health promotion, disease prevention and promoting positive health seeking behaviors especially in relief camps.
- **Seismically Safe Health Care Facilities.** The health care facilities are among the most important buildings in a community, under any circumstances and therefore the buildings need to be built so as to be safer than ordinary buildings in an earthquake prone area. As identified above, large numbers of health care facilities were damaged and made dysfunctional due to their construction being no different than an ordinary building. As part of the reconstruction effort, the repair and construction of seismically safe health care facilities will need to be a priority.

12. **Reconstruction within the framework of health reforms.** The pre-earthquake assessment indicates that the health sector faced significant challenges including a large, poorly planned PHC infrastructure with very low utilization. To repair and rebuild the health care delivery system ensuring access to essential health care for people living in a difficult terrain is a priority. However, it would be imperative that the Government consider introducing critical reforms, as simple replacement of infrastructure is unlikely to have significant impact on health service quality and health outcomes of the population. The questions to consider include:

- **Whether to rationalize primary and secondary health care facilities as part of reconstruction effort:** There are multiple tiers of health infrastructure in both NWFP and AJK. There are redundancies within the health infrastructure and low utilization of PHC and some of secondary

care facilities. The government should consider rationalizing the tiers of health care, the number of facilities to be rebuilt, and the scope of the secondary care facilities in terms of bed strength by taking into account developments such as population movements. It will be appropriate to critically review the need for each facility in terms of its past performance and the population size it will serve.

- ***Whether to consider alternate management arrangements for provision of PHC Services.*** The earthquake enhanced the vulnerability of the populations in the affected districts. In the short term, it will be a challenge for the Governments of NWFP and AJK to cope single-handedly with the health response and rehabilitation and revitalization of the health delivery system. The Government should seriously consider employing innovative measures to provide services including contracting nongovernmental organizations to manage provision of PHC service provision or for new services which need to be introduced.

Short Term Strategies (Up to 18 months)

13. The reconstruction and recovery strategy should be carried out in two overlapping phases, building upon the ongoing work and learning lessons from the relief effort. In the short term, the most urgent need is to ensure access to an essential health care package that reduces vulnerabilities and save lives as the system is revitalized. The estimated cost for short term is Rs. 7160 million. This should include:

14. ***Reestablish PHC system.*** There is an urgent need to reestablish PHC system to ensure provision of essential health services including public health interventions. The package should at least include basic curative care; immunization services, maternal and child health care including management of ARI and diarrhea, antenatal care and family planning, vitamin A and Iron supplementation and communicable disease control interventions including TB DOTS services with a regular drug supply using rented or prefabricated structures for health facilities. The revitalization of the LHWs with linkage to the facilities will be critical. In addition, the governments should strengthen the non-damaged health institutions by enhancing availability of staff to provide services to the population. The Government can also consider contracting NGOs to provide these services with public sector financing. The mission estimates that 150 such facilities would need to be established and will roughly cost Rs 450 million.

15. ***Provision of services for people living in the relief camps.*** The shelter-less and displaced population are being provided shelters in relief camps in the affected region and in other parts of the country. It would be important to ensure that the displaced populations have access to essential health care and preventive interventions besides safe water and adequate sanitation. In addition, it would be critical to map out these camps and estimate their population size for better planning of service delivery. The mission estimates that for about 500,000 people, the cost of such services is about Rs. 100 million.

16. ***Provision of secondary care services at district and Tehsil level.*** There is need for provision of secondary care services at district and Tehsil level in at least 10 locations where hospitals have been completely destroyed. The Government can consider setting up the secondary hospitals in either tented field hospitals or in prefabricated hospitals. The cost will vary based on the selection. The environmental issues related to health care waste management of hospitals will be of concern and should be addressed during the planning stages of these new institutions. Setting up ten 50-bed pre-fabricated hospitals would cost approximately Rs. 720 million.

17. ***Provision of services for the disabled people.*** The exact number of people who have been disabled due to amputations or have spinal injury is not known, however, the rough estimate is that the number of people with amputations would range between 1200 and 2500. In addition there are cases of spinal injury that would need rehabilitative services and people needing accessibility and supporting aids

(crutches/wheel chairs). The Government should ensure that people with disabilities are registered and receive their basic entitlements. The program will need to expand existing national capacity to address the unexpected need, establish community based rehabilitation programs, and set up a rehabilitation center each in AJK and NWFP with capacity building at the local level. The LHWs can play a critical role in the reconstruction effort and the program should be revitalized with a focus on provision of community based rehabilitation. The Ministry of Health and the Directorate of Special Education are working on defining the exact burden and exploring options. A rehabilitation program with capacity building would cost about Rs. 100 million.

18. ***Psychosocial care of earthquake survivors and health care workers.*** There is need for developing a program to address psychological stress of the affected population and the health workers. It needs to be an integral component of the reconstruction effort. In short term the Government should explore options for providing psychological first aid during the next six months, using community based approaches and community level services through NGOs and LHWs. This will also require a public awareness campaign, preparation of training materials for paraprofessionals and voluntary organizations and primary health care personnel so that they can provide psychological first aid as part of their routine activities. This would also need technical support from mental health professionals. The mission estimates that such a program would require Rs. 60 million. In the medium term it should be part of the health services in the affected areas, which would need Rs. 75 million for a three year program.

19. ***Reconstruction and reequipping health management offices and repair of damaged facilities:*** The reconstruction of health management offices and repair of damaged health facilities by the earthquake is a clear priority for the short term. The health sector would need to revise its building norms to ensure that they fulfill seismic requirements. Both AJK and NWFP would need technical support to ensure repaired buildings are seismically safe. The estimated cost of reconstruction, repairs and furniture will be approximately cost Rs. 5,600 million.

20. ***Management and health planning capacity in AJK*** has been severely compromised by the effects of the earthquake and will meet increased challenges given the huge reconstruction effort. In the short term the GOAJK would need to establish a planning and development unit with the placement of professionals from other provinces on secondment; strengthening managerial and planning capacities through technical assistance and developing master plans for the sector based on principles and guidelines outlined by the government. In addition, in the short term the Government should provide technical support and performance incentives to staff for effective implementation of reconstruction effort. The mission estimates that this would entail a cost of Rs. 30 million.

21. ***Strengthen sentinel epidemiological surveillance system.*** The Government should build upon the sentinel surveillance system established in the affected areas and undertake efforts to improve its quality. It would be critical to build capacity of the staff at the district level for effective functioning of the system including a district based laboratory network. The system should cover all hospitals including field hospitals and service delivery points in the tented camps. Besides tracking spread of diseases like ARI and diarrhea, the program should also focus on MCH surveillance. In addition, Leishmaniasis which is endemic in AJK should be closely monitored. The risk of spread of Leishmaniasis is high in earthquake affected areas due to presence of the dogs (reservoir) and the sand fly (vector). With the abundance of stray dogs and earthquake debris creating ideal breeding site for sand fly and the likely compromised immune status of the affected population poses a potential threat for spread of the disease. The strategies for control in short terms include instituting disease (malaria and Leishmaniasis) control measures at the camp sites; developing appropriate surveillance mechanism to pre-empt the spread of these diseases and reducing the reservoir of Leishmaniasis by control of stray dogs. The surveillance program and Leishmaniasis control over the medium term program will cost Rs. 100 million.

Medium to long term strategy (up to three years)

22. The development and implementation of the medium to long term strategy should be used as a means to also explore options for addressing key issues faced by the sector including low utilization and inadequate quality of care. In addition, the medium plan should also consider developing and putting into place an epidemiological surveillance and emergency preparedness and disaster relief system in the health sector. The estimated cost of medium to long term interventions is Rs. 10,853 million.

23. **Reconstruction and reequipping of health facilities.** All levels of the health facilities including secondary care hospitals which have been damaged by the earthquake would need to be reconstructed and reequipped. The health sector would need technical support to ensure reconstructed buildings are seismically safe. The essential package of services for PHC for the affected region should be revisited to align it with emerging local needs and could also include community based rehabilitation and mental health. The service package and size of hospitals should be revisited in light of population size and past performance. This would also require long term training of staff as hospital managers. The environmental issues related to health care waste management of hospitals will be of concern and should be addressed during the planning stages of these new institutions. The estimated cost of reconstruction, repair and reequipping with medical equipment and furniture is approximately Rs. 10,288 million.

24. **Strengthening health system management:** In the medium term the Government should also plan to strengthen health system management especially at the district level. The management capacity can be built through technical assistance, in-service training and introducing performance based incentives to staff for effective implementation. In the medium term this effort should link with other ongoing efforts for management strengthening. A critical area to enhance accountability and monitor the reconstruction effort mechanism for monitoring and evaluation should be designed and operationalized. The estimated cost of management strengthening is approximately Rs. 40 million.

25. **Community based rehabilitation program and improving access for the disabled.** In the medium term, the need for community based care and rehabilitation for the disabled will be an ongoing priority. This would include community-based services and provision of supportive/assistive devices. The inclusion of the disabled in program design will be of critical importance. The program would also need to play an active role to advocate improved access in public buildings by appropriate design. The cost of providing access to people with disabilities is as low as 0.5% of the total project cost. The three year program will cost Rs. 100 million.

26. **Emergency preparedness and disaster management at the federal, provincial and district levels.** The health sector in Pakistan has inadequate arrangements to respond to emergencies and disasters needing health care actions. With the third disaster to hit NWFP in the past four years, it will be important to learn lessons from the disaster response and put in a system which can initiate a well coordinated response and disaster relief effort in 24 to 48 hours. This would need a full review of the present mechanisms, lessons learnt from the existing relief effort, building capacity of health sector and devising an institutional arrangement in the health sector. The program should be developed with WHO technical assistance and could cost Rs. 50 million.

27. **Building seismically safe health care facilities.** As part of the reconstruction effort the repair and construction of seismically safe health care facilities will need to be ensured. The Government should consider establishment of an independent agency at the national level or procure services of structural engineering firm, whose sole task would be the nationwide review of health care facility structural designs for seismic safety, and the field inspection of their construction. The agency or firm should be adequately funded and staffed with qualified engineers with sufficient authority to achieve their purpose, which is to ensure the design and construction of health care facilities according to modern seismic design provisions (the current Pakistan building code of choice, UBC-97, is adequate for this

purpose – it needs to be implemented). The agency or firm besides its immediate utilization in the AJK/NWFP reconstruction would be help design a medium-term program, of seismic retrofitting of all health care facilities nationwide in high seismic zones.

Table 5: Summary of Health Sector Needs in Earthquake Affected Districts of NWFP and AJK

Item	Requirements	Estimated Cost in Pakistan (Rs. million)		
		Short Term Needs (next 18 months)	Medium to long term (24 months to 60 months)	Total cost
<i>Short Term Strategy (up to 18 months)</i>				
1	Reestablish PHC system in rented or prefabricated structures	450		450
2	Provision of services for people living in the relief camps	100		100
3	Provision of secondary care services at district and Tehsil level	720	300	1020
4	Provision of services for the disabled people	100		100
5	Psychosocial Care of Earthquake Survivors and the health care workers	60	75	135
6	Reconstruction and reequipping health management offices and repair of damaged facilities	5600		5600
7	Management and Health planning capacity in AJK	30		30
8	Strengthen epidemiological surveillance system	100		100
<i>Medium to Long Term Strategy (up to three years)</i>				
1	Reconstruction and reequipping of health facilities		10,288	10,288
2	Strengthening health system and management		40	40
3	Community based Rehabilitation Program and improving access for the disabled		100	100
4	Emergency preparedness and disaster management for the health sector at the federal, provincial and district		50	50
Total estimated costs for recovery		7,160	10,853	18,013

ANNEX 9 – EDUCATION

A. Introduction

1. With regard to education the most affected districts in AJK are Muzaffarabad & Neelum, Bagh, and Poonch (Rawala Kot). In NWFP the worst affected districts are Mansehra, Batagram, Kohistan, Abbottabad, and Shangla. The pre-earthquake data in Table 1 puts into perspective the extent of affected areas. The total number of government schools and colleges and private sector institutions in AJK was 7,258. Of the total number of institutions, 3,845 were in the three worst affected districts of AJK; these institutions comprise almost 53% of the province's schools. There were 0.29 million (44% girls) students and 12,971 teachers in these three districts. Similarly, there were 30,951 institutions (including private schools) in NWFP, 7,577 of which were in the province's five most affected districts. The institutions in these five districts were 24.6 % of the total institutions in the province and enrolled 0.7 million students.

Table 1: Pre-quake Total No. of Institutions in AJK & NWFP and No. of Institutions in the Most Affected Districts

Level	AJK			NWFP		
	Total no. of Institutions in AJK	No. of Institutions in 3 affected districts	Institutions in affected districts as %age of total	Total no. of Institutions in NWFP	No. of Institutions in 5 affected districts	Institutions in affected districts as %age of total
School	5,898	3,192	54	25,955	* 6,704	26
<i>o/w primary</i>	4,222			22,024	*	
Colleges	203	89	44	112	16	14
Private	1,157	598*	49	4,884	857	18
Total	7,258	3,879	53	30,951	7,577	24

* Includes 34 colleges.

2. The earthquake has caused extensive destruction to physical infrastructure. Most educational institutions' buildings have either been destroyed or rendered dangerous to use. According to the current estimates, 853 teachers and 18,095 students died.

3. The GoNWFP and GoAJK have carried out preliminary assessments and estimated costs. The World Bank also carried out a rapid assessment. The multi-donor team led by WB-ADB²⁴ held consultations with government teams at the federal level in NWFP and AJK. The team also visited Muzaffarabad, Garhi Dopatta, Bagh and Rawalakot in AJK and Garhi Habibullah, Balakot, Batagram and educational institutions in Mansehra and Abbottabad districts to solicit views of the district administration, educational administration in the affected districts, the National Commission for Human Development (NCHD), teachers, and people directly affected. The estimates have been refined using unit costs that are being used to construct educational buildings under the annual development plans (ADP) of the governments and unit costs for educational projects being funded by the donors.

²⁴ Including representatives from UNICEF, the European Commission and USAID.

B. Damage Overview and Recovery Needs**Table 2: Summary of Damage to Educational Institutions, Cost at Book Value**

Institutions	AJK			NWFP		
	Number of Damaged Institutions	Estimated Cost (Rs. Million)	% of Total Cost	Number of Damaged Institutions	Estimated Cost (Rs. Million)	% of Total Cost
Government Primary	2,153	3,064	22	2,734	2,466	39
Government Middle	565	1,341	10	238	354	6
Government High	312	1,473	11	119	358	6
Government Higher Second	27	188	1	17	77	1
Government Intercollege	25	78	1			
Government Colleges & Postgraduate	28	1,260	9	13	157	3
Technical/Vocational				6	178	3
Private	574	2,620	19	857	1,657	26
AJK University	1	1,600	12			
Materials & Furniture		2,036 ²⁵	15		1,013	16
Administration Buildings	N/A	N/A		N/A	N/A	
Total	3,685	13,660	100	3,984	6,260	100

4. Total damage for the fully and partially damaged educational buildings, materials, furniture and equipment is Rs. 19.92 billion (US\$335 million) for both AJK and NWFP. The reconstruction cost requirements for schools from primary to higher secondary level are the highest with 44% for AJK and 52% for NWFP followed by requirements for private sector institutions in NWFP and AJK, respectively, which are about 26% in NWFP and 19% in AJK. The AJK University accounts for 12% of the damage in the province. Around 69 units of the AJK University including its departments, hostels, administration block, Central Library and campus for Faculty of Agriculture, Rawalakot have been destroyed. Education administration buildings have also been damaged.

²⁵ Cost of materials, equipment and furniture includes Rs 540 million for AJK University.

Table 3: Summary of Damaged Institutions by District, Rural/Urban and Male / Female Primary through Higher Secondary

District	Rural			Urban				Grand Total
	Boys	Girls	Total	Boys	Girls	Private	Total	
AJK								
<i>a. Fully Damaged</i>								
MZD & Neelum	735	521	1,256	14	25	224	263	1,519
Bagh	388	312	700	3	4	105	112	812
Poonch	237	280	517	11	12	115	138	655
Total	1,360	1,113	2,473	28	41	444	513	2,986
<i>b. Partially Damaged</i>								
MZD & Neelum	104	73	177	2	3	5	10	187
Bagh	45	37	82	-	1	2	3	85
Poonch	109	129	239	5	6	18	29	268
Total	258	239	498	7	10	25	42	540
NWFP								
<i>a. Fully Damaged</i>								
Abbottabad	133	76	209	7	3	76	86	295
Batagram	157	63	220	-	1	47	48	268
Kohistan	103	17	120	-	1	33	34	154
Mansehra	459	262	721	12	10	192	214	935
Shangla	118	45	163	1	0	42	43	206
Total	970	463	1,433	20	15	390	425	1,858
<i>b. Partially Damaged</i>								
Abbottabad	332	190	522	18	8	188	214	736
Batagram	105	42	147	-	1	32	33	180
Kohistan	215	35	250	-	1	69	70	320
Mansehra	306	175	481	8	7	128	143	624
Shangla	142	54	196	1	-	50	51	247
Total	1,100	496	1,596	27	17	467	511	2,107

5. In AJK, out of a total of 3,879 institutions in its three most affected districts, buildings of 3,685 institutions or 95% have either fully or partially been damaged. In NWFP, out of a total of 7,577 institutions in its five most affected Districts, buildings of 3,984 institutions or 53% have been either fully or partially damaged. The largest number of fully or partially damaged institutions is in Mansehra District, NWFP.

6. **Other Observed Impacts. Deaths, injuries, and trauma.** In addition to damage to educational institutions and offices, the education sector has lost people. The dead include students, school teachers, and staff. According to preliminary estimates, about 18,095 students and 853 teachers and staff died in NWFP and AJK. In the case of teachers, they represent not only losses to the teaching force, but also a loss of Government investment in teacher capacity development through teacher training. A substantial number of teachers, school staff, and students alike are likely to suffer from emotional trauma and injuries. Students and teachers may require counseling services. Some students may also have special learning needs that would require new teaching approaches and modifications for handicapped-accessible school design. Teachers would need to be trained for school-based psychosocial support, e.g., counseling.

7. With many schools destroyed or partly damaged and in the absence of suitable alternative spaces, educational activities have been interrupted. There will be less time spent in learning, particularly for students who are preparing for their national examinations at the end of the school year.

C. Reconstruction and Recovery Strategy

8. *The most urgent requirement is to resume classes at all levels.* This would entail the provision of temporary and semi-permanent alternative learning spaces, e.g., tent schools and semi-permanent structures, as well as undertaking repairs in partly damaged schools, provision of learning materials, and training teachers to replace those who have perished. Education administrative structures will need to be revived. These measures in the short term are estimated to cost Rs. 1,240 million. Developing the strategy and the action plan for the recovery and reconstruction will include technical assessments to identify schools to be reconstructed and repaired. Assessments of community education needs and site-specific technology options in the context of the disaster will also need to be undertaken. This activity is estimated to cost Rs.60 million in the short term (Table 4).

Table 4: Short and Long Term Needs

	Short-Term	Medium-to Long-Term w/ Seismic Resist	Total
Schools and Temporary Structures	1,000	23,646	24,646
Materials & Furniture	150	3,051	3,201
Teacher Training	30	60	90
Reconstruction Plan	60	60	120
Administration Buildings	N/A	N/A	
Total	1,240	26,817	28,057

9. *In the medium to long term,* the destroyed schools will need to be rebuilt. This will involve the construction of new schools and classrooms, laboratories, libraries, latrines, water supply, etc. It will also include furnishing them with learning materials, furniture, and equipment. Partly damaged schools will also be repaired. It is estimated that the civil works will cost Rs. 23,646 million and the furnishings about Rs. 3,051 million. Teacher training requirements will not be completed in the short-term and will continue on to the medium term. It is estimated that another Rs. 60 million would be required for in-service training of affected teachers and training of new teachers.

Table 5: Needs by District (Rs. Million)

Needs	Replacement w/o Seismic Resist	w/ Seismic Resist
AJK		
MZD & Neelum	10,404	11,466
Bagh	3,507	3,871
Poonch	4,176	4,676
Total	18,807	20,012
NWFP		
Abbottabad	1,848	2,168
Batagram	806	905
Kohistan	594	686
Mansehra	3,023	3,402
Shangla	773	884
Total	7,044	8,045

D. Reconstruction and Recovery Strategy

10. The federal and provincial governments are in the process of formulating their reconstruction strategies. Tent schools in tent villages have already begun. Simultaneously, a village-by-village and facility-by-facility survey is being carried out. Salient features of the strategy include repairing partially damaged buildings first; housing more than one school with low enrollment in one building; not constructing the buildings of schools that were non-functional prior to the earthquake; psychosocial recovery, training of master trainers to train teachers (NWFP has already trained two batches of teachers with UNESCO’s help), vaccination of children in tents and in schools, providing hygiene conditions in tent schools and institutions to be started in other facilities. The Government has released Rs. 50 million each to AJK and NWFP for immediate relief, which also includes restarting of schools/colleges.

11. The Government is planning for “tent schools” and the provision of “school-in-a-box” kits, with the support of donor agencies and NGOs. Books are available in NWFP, but will have to be procured in AJK. The Government has also announced the recruitment of teachers from affected areas on contract basis, which will generate employment. The decision to continue schooling during the winter season will be decided on by GoAJK and GoNWFP as local conditions allow. All the signs indicate that, particularly in the camps, children located there need something to do, and thus do not need an incentive to attend school.

12. **Issues for recovery and reconstruction.** Planning for reconstruction should use empirical evidence and involve consultation, community participation, and participatory needs assessments. The needs of children in various locations should be addressed through child profiling. Girls and disadvantaged groups’ needs may be addressed by deploying female personnel, locating learning spaces close to homes, and providing transportation, among others. Care will need to be taken to avoid inequities in service provision between affected areas and other poor families.

13. The reconstruction strategy should provide a basis for improved 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. Reconstruction should adhere to building codes and compliance should be closely and regularly monitored, particularly as these are public buildings regularly occupied by many people. 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. Given the large scale of the upcoming recovery and reconstruction work, current capacities of District Governments and other stakeholders, e.g., NGOs and the private sector, are already overstretched, and efforts to increase their capacity will be essential to ensure swift implementation.

Immediate to Short term Reconstruction

14. The immediate need is to restart classes. The educational administrative structures need to be revived, especially in AJK. If tent schools are to be set up or some other alternate arrangements are to be made, heating system will also be an immediate requirement for which stove and gas heaters will be required. Repair of buildings with lesser damage and removal of rubble can commence immediately. Students, where possible, can be accommodated in nearby institutions. The resumption of “routine” school activities will help establish some degree of normalcy to the lives of schoolchildren and school teachers and staff.

15. As the reconstruction plan of the education and training sector is developed, some policy decisions will need to be taken, including:

- mapping where schools are needed and construction of schools where needed;
- reconstruction or consolidation of schools; and
- use of temporary or semi-permanent structures.

15. In the most heavily affected areas, the surviving population of school-age children should be estimated to help in the decision for the appropriate number of schools to be reconstructed. Schools to be reconstructed will need to be prioritized, particularly in the face of limited implementation capacity at various levels of the Government.

Medium to Long term Reconstruction

16. In the medium term, it is recommended that counseling for both students and staff be continued. Reconstruction and repair of schools in prioritized affected areas would be initiated and continue. Reconstruction that involves making schools earthquake-resistant would increase the estimated civil works, materials and furniture cost to Rs. 20,012 million in AJK and Rs. 8,045 million in NWFP, totaling Rs. 28.1 billion (US\$472 million), inclusive of teacher training and reconstruction planning.

17. Implementation will meet capacity constraints at all levels. The involvement of NGOs and communities in civil works should be considered, particularly in primary schools. This will not only increase the community's "ownership" of the school, but also provides jobs to community members whose sources of livelihood may now be missing or have been interrupted.

ANNEX 10 – TRANSPORT SECTOR

A. Introduction

1. Roads provide the major means of transport to the affected areas and their reconstruction will be critical to the recovery and reconstruction effort. No damage has been reported to the offices of various roads agencies. The Civil Aviation Authority (CAA) reported minor damages to terminal buildings of the airports at Muzaffarabad and Rawalakot, but CAA is not covered in the assessment.

2. The road network in AJK includes 9,430 km of primary, secondary and local roads of which 4,020 km are paved, 420 km are fair-weather and 4,990 are local or unpaved roads. The Public Works Department (PWD) is responsible for the 4,440 km of paved and fair-weather roads and the Local Government and Rural Development Department (LGRDD) manages local roads. The road network in the three affected districts is 5,305 km of which 2,545 km is managed by PWD and 2,760 km is the responsibility of LGRD.

3. In NWFP, the road network consists of 9,100 km of provincial highways, secondary roads and rural roads. About 5,000 km of these roads are paved. The Frontier Highway Authority (FHA) is responsible for 2,100 km of provincial highways that connect all districts and provide links to the neighboring provinces. The remaining 7,000 km roads are managed by the local governments in the 24 districts. In the five affected districts, the road network is 6,658 km, of which 549 km of provincial highways are under FHA and the rest are with the districts. Three national highways serve as the primary corridor to the affected districts in NWFP. Managed by the National Highway Authority (NHA), the total length of these highways is 270 km.

4. The concerned provincial and local government agencies in both AJK and NWFP prepared preliminary estimates of the damage caused to the road infrastructure, while NHA prepared estimates of damage to national highways. The transport team consulted these agencies to understand the methodology employed for data collection and assessment of the damage and cost estimates. Field observations included visits to the affected areas in AJK and NWFP. The team met with officials of the responsible government agencies, other stakeholders, and earthquake affected persons who have been relocated to tented villages. To validate the damage assessment provided by the government agencies, a combination of rapid field assessments, stakeholder interviews, and desk reviews were conducted in all affected Districts.

B. Damage Overview and Recovery Needs

5. Due to the mountainous terrain in AJK and northern areas of NWFP, access to population centers is by roads carved along mountainsides. The earthquake damage to these roads was primarily caused by landslides. Five types of damages was observed: (i) major landslides causing loss of an entire section of the mountain slope and the road traversing through it; (ii) minor landslides depositing a large amount of debris on the road while the mountainside is unstable; (iii) flow of debris including large boulders on the road; (iv) severe cracking in the road due to embankment failure and upheaval of earth; and (v) unstable mountainside slopes that may lead to potential landslides. Lack of maintenance and extreme weather conditions will accelerate the deterioration of the damaged roads. Overall damage is estimated at Rs. 20.165 billion (US\$339.5 million).

6. Bridges were also affected by the earthquake, but the damage was not extensive. Of particular mention is the Balakot Bridge where severe damage was observed in the reinforced concrete superstructure and the abutments. Some other smaller concrete bridges, culverts, and suspension bridges on rural roads were also damaged.

7. In the three affected districts of AJK, it is estimated that about 2,366 km roads were damaged. Of this 203 km are major roads, 761 km are other paved roads, and 182 km are unpaved roads for a total of 1,146 km representing 45% of the total PWD-managed roads. The Neelum Valley road and, to a lesser extent, the Jehlum Valley road were severely damaged. Both roads are the primary transport arteries in AJK. Another 1,220 km of local unpaved roads developed with community participation and managed by LGRD are damaged. This represents 44% of the total LGRD roads in the affected districts. The assessed damage in AJK is estimated as Rs. 9,190 million.

Table 1: Summary of Road Damage in AJK

Agency		PWD			LGRD	Total
		Major	High	Low	Low	
Muzaffarabad	Total Length (km)	156	748	323	978	2,205
	Damaged Length (km)	83	396	171	587	1,237
	Damage Costs (PRs Million)	668	2,522	484	956	4,630
Poonch	Total Length (km)	167	523	12	983	1,685
	Damaged Length (km)	65	204	5	393	667
	Damage Costs (PRs Million)	423	1,224	11	590	2,247
Bagh	Total Length (km)	154	446	16	799	1,415
	Damaged Length (km)	55	161	6	240	461
	Damage Costs (PRs Million)	638	1,172	23	479	2,312
Total	Total Length (km)	477	1,717	351	2,760	5,305
	Damaged Length (km)	203	761	182	1,220	2,366
	Damage Costs (PRs Million)	1,729	4,918	517	2,026	9,190

PWD: Public Works Department, LGRD: Local Government & Rural Development Department.

Major: Main highways, High: Paved roads, Low: Earthen/shingled roads.

8. In NWFP, about 2,063 km roads were damaged representing 31% of the total road network in the five affected districts. Of this, 652 km are provincial highways that are managed by FHA, 1016 km are other paved provincial roads managed by the districts, 367 km are unpaved districts roads, and 27 km urban roads that are managed by municipal agencies. Estimates of the assessed damage in NWFP are to the tune of Rs. 7,494 million.

9. The three national highways damaged by the earthquake include Mansehra – Pattan (N35), Mansehra – Naran (N15), and Kohala – Muzaffarabad (N75). The damaged length is about 194 km representing 72% of the total length. Estimates of assessed damage to the national highways²⁶ are Rs. 3,481.

²⁶ The World Bank is financing reconstruction of the national highways through additional financing to its ongoing Highway Rehabilitation Project.

Table 2: Summary of Road Damage in NWFP

Agency		FHA		W&S/DC		MC		Total
Type of Road		Provincial Highways	Secondary Roads	Access Roads		Urban Roads		
		High	High	High	Low	High	Low	
Abbottabad	Total Length (km)	58	230	560	949	123	21	1,940
	Damaged Length (km)	5	29	255	0	15	3	306
	Damage Costs (Rs. mill.)	43	186	511	0	76	5	821
Battagram	Total Length (km)	103	108	88	54	0	0	354
	Damaged Length (km)	43	99	88	54	0	0	284
	Damage Costs (Rs. mill.)	366	645	260	68	0	0	1,338
Kohistan	Total Length (km)	27	127	161	317	0	0	632
	Damaged Length (km)	6	40	142	208	0	0	396
	Damage Costs (.Rs. mill.)	51	261	419	260	0	0	991
Mansehra	Total Length (km)	253	347	333	2,229	29	21	3,212
	Damaged Length (km)	31	298	333	0	5	4	671
	Damage Costs (Rs. mill.)	264	1,943	638	0	27	8	2,878
Shangla	Total Length (km)	107	93	213	105	0	0	519
	Damaged Length (km)	44	58	198	105	0	0	405
	Damage Costs (Rs. mill.)	374	376	584	131	0	0	1,465
Total	Total Length (km)	549	905	1,356	3,549	152	42	6,658
	Damaged Length (km)	129	523	1,016	367	21	6	2,063
	Damage Costs (Rs. mill.)	1,097	3,411	2,412	459	103	13	7,494

FHA: Frontier Highway Authority, W&S: Workd and Services Department, DC: District Council, MC: Municipal Committee.

High: Paved roads, Low: Earthen/shingle roads.

Table 3: Summary of Damage to National Highways

	N35: Mansehra - Pattan	N15: Mansehra – Naran	N75: Kohala – Muzaffarabad	Total
Total Length (km)	141	93	40	274
Damaged Length (km)	80	98	16	194
Damage Costs (Rs. mill.)	1,080	2,191	210	3,481

C. Reconstruction and Recovery Strategy

Approach

10. Short term recovery efforts are classified into actions that are immediately required, and those needed in the short term. In view of the oncoming winter and snowfall in the region that will worsen the condition of the blocked roads, the priority should be to clear landslide debris from the roads and provide access to remote areas. This effort has been largely confined to the national highways and some major provincial roads. The responsible government agencies at the Provincial and District levels should mobilize their own equipment and that available from the private sector contractors for clearing debris.

11. Restoration of access on roads where bridges are damaged or the roads have been swept away due to landslide requires immediate actions. Bailey bridges and other similar support structures are needed to provide temporary access.
12. Stabilization of road embankments to ensure that the snow will not cause further damage is equally important. The work involves restoration of retaining walls and drainage structures to ensure that damaged sections withstand the winter.
13. There is need for a comprehensive survey of the damaged roads. Under short term measures, the responsible government agencies should mobilize staff supplemented by consultants, if needed, to undertake this task. Satellite imaging can also be used for remote and inaccessible areas. The road condition data collected will enable the Government to plan and prioritize the reconstruction works. The criteria used for prioritization may include primary road corridors opening access to affected Districts, roads that provide access to a large section of population, and bridges. The reconstruction contracts should include provision that the contractor to give priority to local communities in engagement of skilled/unskilled laborers. While planning and design can be done in the short term, construction will be part of the medium to long-term effort.
14. For local unpaved roads there are considerable opportunities to employ local communities to reconstruct the damaged sections using appropriate labor-based methods. This will also supplement local contractors' capacity. On other rural roads or road embankment works, cash-for-work or food-for-work type approaches can be adopted. Hence, as part of short term efforts, it is important that local and rural roads are identified early on and communities or individuals employed to work on reconstruction or even clearance of landslide debris, and the process for their engagement is initiated.

Critical Issues

15. Implementation will be the key to the reconstruction and recovery effort. Careful planning and realistic scheduling will assist in monitoring progress and ensuring achievement of objectives within the specified timeframes.
16. Ensuring transparency of procurement processes will be critical to achieve the recovery objectives. Hence established procurement procedures should be closely followed. However, there is also a need to simplify procedures and review timeframes of various steps of the procurement process to ensure that procurement does not become a bottleneck.
17. Capacities of the government agencies responsible for recovery and reconstruction need to be reviewed. In some cases, inadequate capacity of these agencies will be exacerbated due to demand for initiating major reconstruction works in short time frames. For the national highways, NHA has the staff resources and experience to undertake reconstruction works. In AJK, the capacity of PWD is limited and has been severely constrained after the earthquake. It may be possible that for major roads NHA can supplement PWD's capacity. LGRD capacity may also need to be augmented. In NWFP, FHA is fully capable to manage reconstruction of the provincial highways. However, the districts' capacity will need to be significantly improved.
18. Timely implementation is directly dependent on capacity of ***domestic consultants*** to undertake engineering design and ***local contractors*** to complete construction within the contract period. Past experience has shown significant delays in implementation, particularly in civil works. It may be important to undertake a focused capacity building effort for the contracting industry. Use of international consultants and contractors may also be considered.

19. Reconstruction activities will place heavy demands on availability of key construction materials, particularly bricks, cement, steel (reinforcing bars and rolled sections), bitumen, etc. The Government will need to carefully monitor prices and take timely and appropriate policy actions to ensure price stability. Large increases in prices will not only adversely impact availability, but will also delay the reconstruction process and constrain available financial resources. Consideration could be given to import, on a limited basis, materials where capacity for local production is limited.

20. To ensure that the road infrastructure restoration/reconstruction effort meets specified quality requirements, a third party technical quality audit could be part of the infrastructure reconstruction program. The audit firm will be responsible for checking quality of all type of reconstruction works ranging from unpaved local roads to the national highways. Likewise, there is a need to review the design standards for roads and bridges to ensure that seismic provisions are adequately reflected, appropriate technology is utilized, and that safety provisions are included in the reconstructed roads.

Short term Recovery (up to 18 months)

21. Immediate actions are as follows:

- Removal of landslide debris and opening the roads to traffic.
- Restoration of roads and bridges.
- Stabilization of road embankment to withstand the oncoming snow.
- Comprehensive condition surveys of all damaged roads to plan and prioritize the reconstruction and recovery works.
- Initiate reconstruction of unpaved local roads using labor-based appropriate technology methods employing communities and individuals to create livelihood opportunities.

Short term activities include:

- Planning and engineering design.
- Bidding of the priority damaged paved roads.
- Mobilization for construction.

A total of Rs. 5,125 million (US\$86 million) will be needed for this phase. Details are given in the table below.

Medium to Long term Recovery (18 months to 5 years)

22. In the medium to long term timeframe, the recovery efforts will include continuation of bidding for the remaining damaged paved roads, supervision and monitoring of the ongoing reconstruction works, and stabilization of the roadside slopes damaged by landslides and potential landslide areas. The estimated cost of this phase is Rs. 19,574 million (US\$330 million). Details are given in Table 4 below.

**Table 4: Summary of Recovery Costs
(in million)**

	Short-term		Medium to Long-term		Total	
	Rs.	US\$	Rs.	US\$	Rs.	US\$
AJK	2,194	37	9,181	155	11,375	192
NWFP	1,529	26	7,707	130	9,236	155
National Highways	1,402	24	2,686	45	4,088	69
Total	5,125	86	19,574	330	24,699	416

D. Environmental and Social Aspects

23. Since the recovery works involve reconstruction of existing roads, the environmental impacts will be limited. The most environment-sensitive activity will be disposal of landslide materials. Careful planning will be needed for reuse of the material for reconstruction and proper disposal.

24. Resettlement will be minimal and will be confined to road damage where the original road cannot be reconstructed and requires partial realignment.

ANNEX 11 – WATER SUPPLY, SANITATION AND SOLID WASTE MANAGEMENT

A. Introduction

1. The South Asia earthquake disaster significantly affected the water and sanitation sector in five districts of North West Frontier Province (NWFP) and four districts in Azad Jammu and Kashmir (AJK). Rural drinking water supply in these provinces is usually sourced from rivers and streams and, to a lesser extent through dug wells and tube-wells. Approximately 75% of rural water systems before the earthquake were gravity schemes, with the balance being met from well sources. Water supply networks and treatment plants in major towns were in poor condition, which has been further exacerbated by the disaster. In some cases existing infrastructure has been completely destroyed.²⁷

2. Water shortages have been reported as a result of infrastructure failure. A survey of hospitals has also indicated a rise in typhoid, hepatitis, cholera and other gastrointestinal water related disease, resulting from unavailability of water and the use of untreated surface water. Quick repair works on the damaged distribution system, provision of temporary filtration facilities and water delivery through tankers has been initiated by the Government and donors to meet daily water requirements. However, the delivery of water has been hindered due to limited access to affected areas. In the short term, priority should be given to rehabilitation of the damaged water distribution network, which can be accompanied by sanitation improvement and hygiene education programs. The need to expedite adequate solid waste management practices and structuring the sector for efficient operation are also critical at this stage.

3. The needs assessment team, consisting of ADB, the World Bank, JBIC and UNICEF, held consultations with representatives of the Tehsil municipal administrations, local and provincial Governments in NWFP, and representatives of the Local Government and Rural Development Department and Public Works Department in AJK. The information provided by these agencies, NGOs working in concerned areas²⁸ and affected communities, existing baseline reports, and observations recorded during reconnaissance missions and surveys have served as a base in formulating the initial damage and needs assessment report. Field visits were undertaken in Muzaffarabad, Bagh, Poonch, Abbottabad, Mansehra and Batagram. A precise assessment of the damage is not possible at this stage due to the wide spatial spread of damage, time restrictions and data logistics.

B. Damage Overview and Recovery Needs

4. **Water Supply and Sanitation.** The assessment is based on field data provided by the District and Tehsil departments dealing with water supply and sanitation, the District Coordination Officers, local NGOs involved with implementation of water supply and sanitation projects in the sector, and field staff of projects stationed in the affected areas, and through unstructured interviews of people coming from the affected areas. The baseline information on the large water and sanitation schemes is relatively accurate in both NWFP and AJK, however information on small community-managed schemes executed by the local government departments (TMAs) is not well documented in NWFP and has been estimated by extrapolating the data on community Water and Sanitation schemes undertaken through World Bank, ADB, DFID, and IFAD-financed projects. In AJK the data on the small rural water and sanitation schemes were compiled recently under World Bank-financed CISP, and is well reported.

²⁷ The Pakistan Integrated Household Survey (PHIS, 2002), indicates approximate 80% urban water coverage and 65% rural water coverage in AJK prior to the October, 8 earthquake. In NWFP, PHIS information indicates approximate 97% urban water coverage and 71% rural water coverage. Overall population in affected areas with latrines within the household has been computed to be 4 and 3%, respectively.

²⁸ These include Sungi and SRSP in NWFP.

5. **NWFP.** The overall estimated water supply coverage²⁹ is 50 % of the total population of 500,000 households in five Districts of NWFP damaged by the earthquake, covering about 250,000 households (including 180,000 households with house to house connections). As a result of the earthquake an estimated 77,500 households have only partial or no water supply. This does not include the 250,000 households that did not have a water source within a reasonable limit of their house (500 meters) before the earthquake. Overall damage to the 763 large schemes (average 300 households per scheme) operated by the Water and Sanitation Department, includes 220 that are partially damaged (minor to major repair). Out of the 3323 small community or TMA operated schemes (hand pumps and small gravity schemes – average 20 households per scheme) 1234 are partially damaged while 2,089 are operational. The overall estimated cost of these damages to both Public Health Engineering Department (PHED) and community schemes is Rs. 482 million.

6. Most damage is concentrated in rural areas. The small urban pockets that have been affected include Balakot, Batagram, Besham and outer fringes of Mansehra and Abbottabad city.

7. In NWFP, about 85% of the water supply schemes are gravity based, and the remaining 15% consist of tube-wells, dug-wells and hand-pumps. Major damage has been reported at the intake of gravity schemes. Other significant damage is to water supply due to landslides and to distribution system due to structural collapses. The damage to water reservoirs, hand pumps and tube-well schemes (ground water sources) has been minimal.

8. As many as 25,000 households may have lost their sanitation facilities in NWFP. Based on 2005 projections, Government and on-site reports, damage to drainage systems has been correlated to household damage and computed in urban areas for Balakot and Batagram (90% damage) and Besham (40% damage), and rural areas. The total replacement cost for sanitation systems is estimated to be Rs 88 million.

9. **AJK.** In AJK, three large urban water-supply schemes operated by PHED are providing water to the district headquarters of the three affected districts. Out of the total estimated 23,000 households living in these urban centers 16,500 households (about 80%) are provided with direct connections. After the earthquake the supply of water from the treatment plants in these cities has been reduced to about 62% of system capacity. All three large urban water-supply schemes³⁰ are partially damaged. The estimated cost of urban water damage, including the six other small urban centers in the affected area is Rs. 83 million.

10. Overall estimated rural water supply coverage is 65% of the population in the three Districts of AJK damaged by the earthquake, covering about 152,000 households. An estimated 11,400 households are now without access to water and another 64,600 households are getting only partial water service. It is estimated that 234 rural systems are completely destroyed, 1,334 are partly damaged (minor to major repair), and 462 are operational, out of the 3,147 medium to small schemes operated by the communities (hand-pumps and gravity) or Government (usually 1,000 households and above). The overall estimated cost is Rs. 509 million.

11. Most of the water supply schemes in AJK rural areas are gravity based, and in the urban areas source are either perennial streams or rivers, using pumping systems. In the rural areas the damage is mainly to the source, intake structures and water mains, and to a much lesser extent to the tertiary

²⁹ Averages computed from PHIS district data for PHED schemes and community coverage (based on NGO and donor reports).

³⁰ The cost of damage to six other minor towns is worked out on the same assumption as used for rural damage, which is based on approximate damage estimates provided by the PHED department, further adjusted based on mission field visit observations.

networks. In the urban areas the damage has been mostly to the intake facilities (treatment plants) and tertiary networks due to building and structure collapse in both cases.

12. In AJK, sanitation coverage in the form of street drains is approximately 65% in urban settlements (specific Statistics coverage, 2005, for Muzaffarabad, Poonch and Bagh has been utilized in the computations), and the damage has been correlated to damage in the housing sector (to be confirmed after rubble clearing). In rural areas, the Government has reported 30% damage to drainage systems. The combined urban and rural cost estimate for damage to drainage is Rs. 86 million.

13. **Solid Waste Management.** Provincial statistics (2004) indicate the existence of very limited garbage collection services in affected areas, largely restricted to municipal centers (approximately 45% of households), where the balance is disposed of randomly. Where such services were in place, such as in the towns of Muzaffarabad and Mansehra, dumpsites and collection trucks have no reported damage.

Table 1: Summary of Damage to Water & Sanitation Sector (Rs. million)

Territory	District	Urban		Rural		Total Damage Cost
		Water	Sanitation	Water	Sanitation	
AJK	Muzaffarabad	33	13	172	31	249
	Bagh	27	4	97	15	143
	Poonch	23	7	157	16	203
	Subtotal	83	24	426	62	595
NWFP	Abbottabad	-	-	35	15	50
	Batagram	-	-	130	29	159
	Kohistan	-	-	38	19	57
	Mansehra	-	-	213	12	225
	Shangala	-	-	76	13	89
	Subtotal	-	-	482	88	570
TOTAL		83	24	908	150	1165

Note: Damage costs have been calculated as the repair cost of partially damaged water supply and sewerage systems and replacement cost for totally damaged assets. Data sources include Government estimates and community schemes constructed under various programs and mission estimates. The damage cost of public buildings has not been included (please refer to paras.15 and 17). Sanitation damage is based on reported housing damage.

14. **Institutional issues.** The NWFP water and sanitation administrative and institutional infrastructure has generally suffered only minor damages. The only Tehsil Municipal Administration office with substantial damage is Balakot, which included loss of records and staff. The cost of damage to administrative set-ups related to water supply in NWFP is approximately Rs. 35 million.

15. The AJK PWD administrative infrastructure has suffered major damage, including losses to life, property and records. Most of the buildings housing the Local Government and PHED staff in urban areas of Muzaffarabad, Bagh and Rawalakot have either collapsed or are damaged beyond repair. The estimated cost is Rs. 320 million.

C. Reconstruction and Recovery Strategy

Approach

16. The reconstruction and recovery strategy for the water supply, sanitation and solid waste management sectors will be guided by the following principles:

- Rebuilding and rehabilitation should be premised on locally adapted and accepted practices.
- Actively promote safe water, sanitation and solid waste management programs.
- Introduction of appropriate technical upgrades, including improved design and construction materials (e.g., use of HPD piping material).
- Local Government-led and Community-implemented tertiary infrastructure rehabilitation in accordance with the principle of subsidiarity, existing mandates, and recorded ownership of damaged schemes.
- Damage verification. A detailed damage assessment should be carried out prior to initiating the rehabilitation and reconstruction process.

Critical Issues

17. ***Water and sanitation policy*** for rehabilitation and reconstruction should be developed by the Provincial authorities in consultation with TMAs, district governments, civil society and communities. The water and sanitation policy for rehabilitation and reconstruction, in coordination with the housing sector strategy, should consider delivery of services based on reviewed urban boundaries.

18. ***Capacity assistance***. In both AJK and NWFP the number of schemes to be rehabilitated and/or reconstructed in the short and medium term represents a significant increase in implementation. Whilst rehabilitation may require fewer resources than construction of new schemes, the following are expected to be required for timely rehabilitation: (i) planning and technical support to communities for reconstruction and enhancement of damaged community schemes; (ii) technical support to local government agencies for project planning, design, implementation, contracting, supervision and monitoring; and (iii) strategic packaging of rehabilitation works based on sound geographical grouping and outsourcing. Different options to be considered include deputation from professional institutions and/or departments in other Provinces in the country, recruitment of incremental staff and active engagement of NGOs.

19. ***Inter-sectoral coordination*** is essential to adequately address the needs of the affected population and minimize implementation delays in the reconstruction process. Consistency with the housing sector strategy and overall approach is of particular relevance and shall consider the following principles:

- Water and sanitation services will complement predominantly in-situ rebuilding and rehabilitation of housing.
- In areas where population is highly dispersed or damage is extensive and cannot accommodate pre-earthquake populations, design of replacement water and sanitation schemes will be considered with land readjustment schemes.

20. ***Financial sustainability***. In addition to geographical location, the quality of engineering design and the quality of construction, quality of facility operation and maintenance can reduce vulnerability and

positively contribute to disaster mitigation and preparedness. Improved scheme sustainability should be considered in the medium to long term, as well as in the selection of repair and improvement measures.

Short Term Priority (up to 18 months)

21. **Infrastructure needs.** Water and solid waste services to relief camps over the short term have not been costed in this assessment. Immediate and short term efforts³¹ in this sector should focus on: (i) rehabilitation of partially damaged Government and community spring/gravity water schemes, dug-wells and hand-pump infrastructure; (ii) rehabilitation of partially damaged surface water (river) schemes and associated treatment plants, such in the case of Muzaffarabad town;³² (iii) rehabilitation of partially damaged water distribution networks; (iv) rehabilitation of communal latrines; (v) initiating a solid waste management program for clearing and recovery of debris;³³ (vi) provision of basic buildings for AJK Government staff supporting water and sanitation related agencies; and (vii) development of water quality and source monitoring, and leakage detection programs.

22. **Institutional and governance requirements.**³⁴ Short term needs in this sector must consider: (i) formulation of a water and sanitation rehabilitation policy and strategy for NWFP and for AJK; (ii) recruitment/deputation of incremental staff to local government for planning, implementation, contracting, supervision and monitoring; (iii) provision of community awareness and technical training to undertake repairs and rehabilitation; (iv) facilitating community consultation and participation programs for reconstruction of large schemes, and water and sanitation options for selected localized land readjustment schemes and small-scale relocation schemes;³⁵ (v) local government capacity development; and (vi) formulation and delivery of sanitation and hygiene training and education programs, adapted to local conditions and practices.

23. **Cost estimates for immediate and short term assistance (up to 18 months).** Safe drinking water is a basic necessity, and restoration of pre-earthquake coverage must be prioritized. As such, the reconstruction and recovery strategy for this sector considers that the rehabilitation of all partially damaged schemes should be completed within 18 months. The total estimated cost for the short term assistance is Rs. 1,147 million for replacement of assets and implementation.

³¹ Prioritization of works should consider overall effectiveness with regards to population coverage.

³² Restoration of water treatment systems, and in particular filtration and chlorination facilities, should be expedited as highlighted in water quality reports (Pakistan Council of Research in Water Resource, October 2005), which indicate microbiological contamination of water sources, particularly in AJK.

³³ Recovery and reuse of material should be promoted. Based on the nature of the materials utilized, this is foreseen to be particularly viable in rural areas. In urban areas, centrally managed (TMA, NWFP or municipal corporation, AJK) sites should be designated and adequate machinery provided for crushing, cutting and safe final disposal in designated controlled dump-site. Transportation of debris to selected site locations outside highly populated areas will have to be considered. The cost of this component is presented under the “environment” sector assessment of this report.

³⁴ Rehabilitation and reconstruction programs should consider (i) maximizing the opportunity for local income generation, (ii) maximizing opportunities for community-based approaches, (iii) maximizing the opportunities for better household sanitation and waste management practices, (vi) using the community’s potential for operation and maintenance.

³⁵ These activities will be combined with those undertaken by the housing sector and therefore have not be costed.

Table 2: Short Term Needs for Water Supply and Sanitation Sector (AJK+NWFP)

Component	Cost Estimation Base	Replacement Cost* (Rs. million)	Partial Upgrade Cost (Rs. million)
Water Supply	Rehabilitation of full rural schemes and urban source intakes	338+590 = 928	478+889 = 1367**
Sanitation	Re-construction of public latrines	35	125+35=160***
Institutional	Staff recruitment, community support and hygiene education	85	85
	Basic buildings	100	100
Total		1147	1712

* Since most systems are reported to be partially damaged, retrofitting of the undamaged portion has been costed through applying a flat 20% cost increase multiplier.

**Calculations assume partial upgrading through a 3% annual population increase for 2 years in rural water to accommodate rise in population.

*** The cost includes provision of public toilets for partial and fully affected households in urban areas, urgently required in the short term leading to the reconstruction process.

Medium Term Priorities (18 months-3 years)

24. **Infrastructure needs.** This phase should focus on providing water and sanitation to towns where major reconstruction activities are required, namely Muzaffarabad and Bagh, in AJK, and Balakot, Battagram and, to a lesser extent, Besham, in NWFP. Medium term priorities will focus on (i) providing water distribution networks for reconstructed settlements; (ii) providing water systems for selected new settlements resulting from land readjustment and small-scale relocation schemes;³⁶ (iii) drainage and/or sewerage for reconstructed settlements; (v) formalization of solid waste management schemes in large towns; (vi) reconstruction of full AJK Government PWS and LGRDD offices; and (vii) upgrading sector facilities for disaster preparedness.³⁷ Although the computations presented do not incorporate infrastructure elements that were not present prior to the earthquake disaster, it is recommended that, as part of the reconstruction planning and development strategy of fully destroyed settlements, development needs, and in particular the construction of upgraded water and wastewater treatment systems in densely populated urban areas, be considered.

25. Institutional and governance requirements for the medium term should consider (i) improved planning and preparedness for disaster management in the water and sanitation sector; (ii) institutionalization and streamlining of successful and effective planning, implementation, supervision and monitoring practices; and (iii) independent evaluation of sector reconstruction process and financial, technical and social auditing. The total estimated cost for the medium term assistance is about Rs. 753 million (exclusively for replacement of assets and implementation).

³⁶ In the absence of specific relocation schemes data on magnitude and scope, the cost of providing water and sanitation services cannot be costed.

³⁷ This should include measures such as the provision of emergency generators for water pumping in the event of power failure and retrofitting towards improved disaster resistance.

Table 3: Medium Term Needs for Needs for Water Supply and Sanitation Sector (AJK+NWFP)

Component	Cost Estimation Base	Replacement Cost (Rs. million) *	Partial Upgrade Cost (Rs. million)
Water Supply	Water distribution networks for reconstructed settlements	103+ 23= 126	134+33 = 157**
Sanitation	Reconstruction of drainage systems in urban areas	136+151 = 287	170+189=358***
Solid Waste Management	Formalization of solid waste disposal centers in selected participating urban centers (Phase I)		53
Institutional	Staff recruitment	85	85
	Basic buildings	255	255
Total		753	908

* Since most systems are largely reported to be partially damaged, retrofitting of the undamaged portion has been costed through applying a flat 20% cost increase multiplier.

**Calculations assume 100% water distribution networks coverage for urban centers in need of reconstruction (including Muzaffarabad, Balakot, and Bagh).

***Calculations assume 100% drainage coverage for urban centers in need of reconstruction (including Muzaffarabad, Balakot, Bagh and Batagram).

D. ENVIRONMENTAL AND SOCIAL ASPECTS

26. **Debris disposal.** Geographical conditions and the absence of adequate waste management practices pose a severe environmental problem. Safe and controlled disposal practices and designation of waste disposal zones should be immediately identified and communicated to the communities, particularly in densely populated areas.

27. **Lack of hygiene practices.** In view of the loss of a large number of household latrines, appropriate communal sanitation facilities must be provided in the short term. In addition, hygiene education programs should be formulated to ensure use of toilets, washing hands and cleaning of the living environment.

28. **Gender and social issues.** Provision of short and medium term accommodation arrangements should take into consideration gender differences. Separate arrangements and facilities should be provided for men and women. Moreover, social issues to be considered while formulating a reconstruction strategy (including water and sanitation infrastructure) comprise fair asset distribution, resettlement and livelihood options, and preserving community fabric for successful implementation and operation of new and rehabilitated schemes.

29. **Community participation** in the reconstruction process, especially for small schemes, networks of smaller settlements within towns should be promoted. In addition, findings derived from the implementation of projects related to natural disasters have highlighted the need for integrating recovery and long-term development planning as well as population targeting that should be identified on a needs basis.

ANNEX 12 – ENERGY SECTOR

A. Introduction

1. *Overview of the energy sector in the earthquake affected areas.* The energy sector in the affected areas consists of four subsectors: (i) the power sector; (ii) the petroleum sector; (iii) the natural gas sector; and (iv) subsistence fuels (wood and dried dung). This damage assessment focuses on the first three subsectors and provides separate descriptions of the power sector and the fuels (petroleum, LPG, and natural gas) sector.

2. Through the guidance and leadership of the Ministry of Water and Power (MOWP) and the Ministry of Petroleum and Natural Resources (MPNR) information was gathered from the involved agencies in the power sector³⁸ and in the petroleum sector³⁹, as well as from visits to the affected areas. Furthermore, the World Bank/ADB energy assessment team interacted directly with senior staff from the affected companies in the power sector through meetings conducted in Islamabad.

3. The agencies involved have physically inspected their respective power and fuels systems. IESCO and PESCO have been able to inspect both the 132kv system and distribution system, although it should be noted that about 40 percent of the affected area within the AJK electricity system has not yet been surveyed as access to these areas is still very limited. These areas are primarily rural areas, while all the highly populated areas have been inspected. In terms of the fuels sector field staff of the oil companies have inspected most of the facilities and provided direct input to the assessment.

B. Power Sector

4. *Pre-earthquake status of the power system.* Responsibilities for the supply of electricity in the affected areas is shared by a number of agencies/utilities.

Azad Jammu and Kashmir

- Electricity Department of Azad Kashmir (AJKED) is responsible for distributing electricity in AJK – including the affected districts (Muzaffarabad, Bagh and Rawalakot). It purchases electricity in bulk from two distribution companies (Islamabad Electricity Supply Company (IESCO) in the southern parts of AJK, and from Peshawar Electricity Supply Company (PESCO) in the northern portions). AJKED constructs and operates the distribution networks (11 kV and 0.44 kV), provides consumer connections, and manages the billing, collection and other operational matters. Prior to the earthquake, AJKED served about 363,000 consumers, of which 323,000 were residential, about 38,000 were commercial, and 1,800 were industrial consumers.
- IESCO manages the Secondary Transmission and Grid (STG) network in the southern part of AJK – this includes one 132 kV line and grid station (Rawalakot) and two 33 kV grid stations (Bagh and Hajeera).
- PESCO manages the STG network in the northern parts of AJK – this includes 132 kV lines and grid stations serving Muzaffarabad, and 33 kV lines and grid stations serving Hattian and Nauseri.

³⁸ The involved agencies in the power sector are the AJK Electricity Department, Islamabad Electricity Supply Company (IESCO), Peshawar Electric Supply Company (PESCO), Sarhad Hydro Development Organization (SHYDO), and Water and Power Development Authority Hydel Section (WAPDA Hydel)

³⁹ The involved agencies in the petroleum sector are SHELL, PSO, Caltex, and a number of retail LPG entities.

NWFP

- PESCO has full responsibility for electricity distribution in the affected districts of NWFP (Abbottabad, Mansehra, Barragram, Kohistan and Besham). It manages both the STG and distribution (11 kV and 0.44 kV) networks, provides consumer connections, and handles billing, collection and other operational matters. Prior to the earthquake, the average monthly demand for electricity in the two circles of PESCO which were impacted (Abbottabad and Mansehra) by the tremors was about 48 million kWh.

B.1 Damage Overview and Recovery Needs

5. The main components of the power sector which were impacted by the earthquake are the secondary transmission (STG) and distribution systems in AJK and the Northern Areas; a number of small hydropower stations were also affected. The quantum of damages in the power sector (i.e. excluding the cost of providing electricity to tent villages, new housing developments, etc.) is estimated at about Rs 642 million.⁴⁰ These estimates (see Table 1) have been prepared by;

- *Electricity Department of AJK (AJKED)* for the distribution network and four hydro generation sites (capacity about 35 MW) in AJK;
- *Sarhad Hydro Development Organization (SHYDO)* for five mini/micro hydro generation units in the Mansehra and Kohistan district, which are owned by Shydo;
- *Peshawar and Islamabad Electricity Supply Companies (PESCO and IESCO)*. PESCO's estimate covers STG and distribution systems in the Northern Areas, while IESCO's numbers refer to STG networks in AJK which are owned and operated by IESCO; and
- *WAPDA*. for the approach roads and preparatory works of the Allai Khawar Hydropower Project – being constructed by WAPDA in Kohistan district.

Table 1: Overview of Damage

Region/Implementing Agency	Damage (Rs. Million)	Description of Damage
AJK	222.5	Distribution System, including Consumer connections; some small/micro hydro plants
IESCO	35.0	STG network, 3 districts of AJK – primarily buildings/civil works; some equipment was also destroyed when buildings collapsed
PESCO	333.6	Extensive damage to Distribution System and STG network in five districts (Abbottabad, Mansehra, Batagram, Kohistan and Besham) of NWFP
SHYDO	24.3	Civil works at four small hydro stations have been damaged
WAPDA	26.4	Approach roads and other preparatory civil works of Allai Khawar hydro power project, which is being constructed in Besham district, were extensively damaged.
Total	641.8	

These estimates are based on recent quotations received or contracts awarded by the utilities for the same or similar equipment and their latest estimates of civil works costs. The civil works cost estimate

⁴⁰ In case of AJK, about 40% of the area where electricity is supplied is still not accessible, and therefore has not yet been surveyed. These numbers do not include the cost of damage to infrastructure in those areas.

(Rs. 1,200/Sq foot) has been escalated, to account for these buildings to be designed to higher specifications, and to comply with applicable building codes for earthquake resistance.

6. **Categories of damage.** Five agencies are responsible for power generation, transmission, and distribution in the affected areas, and the principal for the rehabilitation and reconstruction of the power sector is that these agencies will be responsible for their respective functions and geographic areas. The table below indicates the damage by item and responsible agency, as well as the aggregate total damage.

Table 2: Damage by Implementing Agency and Functional Area
(Rs. million)

	PESCO	AJKED	IESCO	SHYDO	WAPDA	Total
STG	234		35			269
Distribution	100	173.0				322
Hydro Plants		49.6		24	26.4	100
Total	334	224.6	35	24	26.4	642

7. Regarding hydro sites, powerhouse equipment was damaged in one station (Kathai) in AJK. At the other stations, the damage is confined to civil works including approach roads, intake structures, forebay and penstocks. Overall damage is estimated at Rs. 100 million, of which the largest amount, Rs. 26.4 million, is for approach roads (including bridges and culverts, retaining structures, etc) and other preparatory works of Allai Khawar project.

8. In case of STG, a major component of the cost covers equipment which was damaged or destroyed when the control room buildings collapsed. Residential buildings, store rooms etc, were also damaged or collapsed completely. Some equipment items (e.g. transformers) were dislocated from their foundations, but did not suffer structural damages; these have been placed back on original foundations, and are operational. For two transmission lines, a number of towers were damaged and had to be replaced or relocated.

9. Damage to the distribution infrastructure in both AJK and in the affected districts of NWFP (i.e. the service area of PESCO) was extensive, and includes 11kV and 0.44 kV distribution lines and feeders, transformers and other equipment, as well as consumer service connections. About 18,700 consumer connections in PESCO area, and about 61,000 in AJK, have been disrupted and need to be replaced. Some residential and office buildings of PESCO and AJKED have been damaged/destroyed, and need to be reconstructed. The damage to distribution networks is roughly equally divided between the utilities' assets (lines, transformers, civil works, etc) and consumer service connections (including new meters, service drops, service masts, etc).

10. **Damage by District.** The impact on distribution infrastructure appears to have been greater in AJK than in NWFP. By contrast, the estimate of damages to STG facilities appears to be larger in the NWFP districts.

11. The damage to distribution networks in AJK is about Rs. 173 million; damage to IESCO's STG networks, which are located in AJK is Rs. 66 million; and damage to hydro stations owned by the AJK Government is estimated at about Rs. 50 million.

12. Damage to distribution networks in NWFP is estimated at about Rs. 125 million, and damage to PESCO's STG network is about Rs. 173 million. The cost of replacement works at Allai Khawar hydropower project – while this power plant is to be implemented by WAPDA, it is physically located in Kohistan District of NWFP – is about Rs. 26.3 million.

13. **Immediate actions taken by Government agencies/companies.** Electricity bulk supply, through the 132kV lines from PESCO and IESCO, was restored to near pre-earthquake levels within days of the October 8th earthquake. The distribution and retail service delivery areas were the most damaged, but partial restoration was achieved quickly by the responsible agencies. Based on feedback from the various sector cluster teams it appears that, due to the early actions of the responsible agencies, power supply appears to be adequate at the moment. The Government announced relief of electricity payments for the next three months.

14. The thrust of the early actions was to provide spares and manpower from unaffected areas, and bring these “reconstruction teams” with spare parts to the affected areas to restore the power installations. Most of the immediate repair works are of temporary nature but it is expected that these solutions will be in place during the short term horizon.

B.2 Reconstruction and Recovery Strategy

15. The service recovery and reconstruction needs in the power sector from now and for the next 3 years can be summarized as follows:

- Emergency procurement of high and low voltage lines, transformers, grid station equipment, tools, vehicles, materials for operational and staff quarter buildings, including replacement of material already provided from other companies and projects.
- Electrification, which covers both installation and supply, of the tent villages.
- Emergency repairs and reconstruction of the damaged electricity network and related buildings.

Table 3: Power Sector Reconstruction Costs

	Unit	Quantity	Cost of Damage
Hydro Power Plant	nos.	10	70.69
132kV Line	km	2.00	34.00
132/33kV Substation ¹	nos.	5	88.72
33kV Line	km	10.00	4.00
33/11kV Substation ²	nos.	5	70.10
11kV lines	km	100.00	35.08
11/0.4kV substation ³	nos.	566	75.29
LT lines	km	110.00	27.71
Service connection	nos.	79,723	124.44
Buildings	-		165.71
Spares	-		20
Tools & Vehicles	-		4.00
Tent Villages - Electricity supply for 1 year			180.00
Tent Villages - Electricity Installation			90.00
Electricity Relief to affected areas (3 months)			657.00
Electricity Installation to Anticipated new towns	-	-	200.00
Total Reconstruction Costs - Power Sector			1,848.74

- Provision of cash for supply of electricity to the affected areas to compensate responsible agencies for the Government’s decision to grant 3 months of payment relief.
- Upgrading and expansion of power sector systems to improve access of the poor to electricity, and provide electricity to promote economic development in the earthquake affected area.

16. **Short Term Priority (up to 18 months).** There are two equally important immediate priorities, namely (i) electrification of the tent villages, and (ii) restoration of electricity supply to the customers that have yet to receive resumed services. Accordingly, short term requirements will be repair and rehabilitation of existing damaged distribution lines, transformers, and service connections. As houses are being erected in place of the damaged ones new service connections are needed and where new housing is being developed sufficient provision of electricity must be an integrated part of the planning and implementation process. The cost estimates reflect technological upgrading of the equipment to ensure improved efficiency and quality of service, which will benefit the area through increased economic activity. This means that transformers that were overloaded prior to the earthquake and damaged have been replaced with a suitable sized transformer for the estimated load it will serve during the next five years. In terms of cost allocation, the power sector could consume the above costs in the short term with construction activities possibly spilling over to the early periods of the medium to long term.

17. **Medium to Long Term Priorities (18 months to 3 years).** Several projects concerning power generation, transmission, and distribution were already in place prior to the earthquake to address increased electricity demand in the affected areas. It is important that these projects continue to be supported and sufficiently funded. As the reconstruction work progress across all sectors, continued monitoring and adjustment of the medium to long term demand forecast for the affected areas should be done, resulting in updated plans for generation capacity and required investments in the power sector.

18. The ability of consumers to pay for energy need to be further investigated. Already a 3 months moratorium has been declared by the Government concerning electricity payments, and as electricity is envisioned to be provided for free in the tent villages it should be expected that other affected people residing outside the tent villages would also make claims to similar relief provisions. As any such relief decisions would have to be considered across sector boarders we are not advocating any particular arrangements but rather bring the subject for consideration. It is critical that cash payments are made to energy providers (electricity and petroleum companies) to ensure sufficient cash flow within the sectors to pay the providers so that no sectoral effects negatively impact the financial and technical viability and further development of the energy sector.

C. Fuels Sector

19. The earthquake-affected Districts of AJK and NWFP are predominantly dependent⁴¹ on LPG and firewood for their cooking needs, while small amounts of kerosene is consumed for lighting if the village/town is not electrified. There are a number of LPG marketing and distribution companies, mostly private, operating in these Districts through a chain of dealers/points of sale that are supplied LPG from Rawalpindi area. Transport fuels (petrol and diesel) are also supplied to these districts by a number of Oil marketing Companies (OMC) through their retail outlets from their storage facilities in Sihala, Chaklala, Morgah, Taru Jabba, etc. All OMCs, except one, are privately-owned. In the earthquake-affected Districts, there were no major oil or LPG installations, but only the LPG distributor facility or oil retail outlets. The total number of retail outlets of different OMCs, and the annual sales, is provided in Table 1.

⁴¹ Only the town of Mansehra is connected with the natural gas pipeline system of SNGPL; after the earthquake, the distribution system was isolated and thoroughly checked for any damage. There was none. However, minor damage to the system in Islamabad was experienced.

Table 4: Petroleum Products Distribution Network
(No and '000 liters.)

	PSO	Shell	Caltex	Total	APL	Admore	Total
AJK	7	15		0		1	23
NWFP	27	17		1			45
Total	34	32		1		1	68
Sales	10,020	39,190					49,210

Source: Oil Companies Advisory Committee Annual Report, 2003 and OMC recent data.

C.1 Damage Overview and Recovery Needs

20. Assessment of the damage was done through the support of Ministry of Petroleum & Natural Resources (MPNR), and by circulating a questionnaire among the LPG marketing and distribution companies, and OMCs. Data received from most of these companies indicated that, notwithstanding the severe intensity of the earthquake, there has been no damage to the storage facilities in Rawalpindi and Peshawar, and minimal damage to the distribution network in the affected districts. According to preliminary estimates, the total cost of damage in the fuel sector is estimated at about Rs. 102 million.

21. *Categories of damage.* The damage to the fuel supply system in the earthquake-affected Districts of AJK and NWFP was mostly due to the destruction of distributor/dealer/agents premises or the oil retail outlets, with the consequent loss of partial or full inventory of filled/empty LPG bottles or petrol and/ or diesel through storage tanks. There has been some damage to gas meters, pipelines, and office buildings.

22. Table 5 provides estimates of earthquake damage by major categories, separately for AJK and NWFP, and by public- and private-sector entities:

Table 5: Summary of Earthquake Damage to Fuel Supply Infrastructure
(Rs. Million)

Description	Unit	NWFP-Affected Districts*				AJK-Affected Districts				Grand Total Cost
		Physical Quantity			Cost	Physical Quantity			Cost	
		Public	Private	Total		Public	Private	Total		
Petroleum Sub-sector										
Storage Tanks	MT	0	19	19	0.3	0	0	0	0.0	0.3
Retail Outlets (w/o land)	No.	1	3	4	30.0	1	5	6	45.0	75.0
Dispensing Unit	No.	3	9	12	0.4	3	15	18	0.5	0.9
Inventory	MT	0	0	0	0.0	0	10	10	0.5	0.5
Sub-Total					30.7				46.0	76.7
Natural Gas Sub-sector										
Sub-Total	No.				3.0	Natural gas not supplied in AJK				3.0
LPG Sub-sector										
Distributor (Asset+Inv)	No.	0	24	24	7.2	0	22	26	6.6	13.8
Cylinder: Point of Sale	No.	0	2400	2400	3.1	0	2200	26	2.9	6.0
LPG Inventory: POS	Kg	0	38	38	1.5	0	29	26	1.2	2.7
Sub-Total					11.8				10.6	22.4
Grand Total					45.5				56.6	102.1

* Includes small damage to infrastructure in Islamabad as well.

Source: Oil and LPG Companies.

23. *Damage by District.* While estimates of damage are still awaited from a number of distributors/retail outlets in affected Districts, a conservative estimate has been made on the basis of typical assets and the level of inventories usually maintained. Estimates of actual losses may be revised based on input from all distributors (especially LPG), who are currently not contactable. Table 6 provides details of the damage to the fuel sector assets and inventories.

24. **Immediate Actions Taken by Government Agencies/Companies.** Soon after the earthquake, MPNR asked all public sector and private companies to assess the damage to lives and properties, and ensure the least possible disruption of essential fuel supplies. Since supplies were dispatched from storage facilities in Rawalpindi and Peshawar areas by road, and the road network was blocked, there was some initial disruption. Because of the damage to the LPG distribution network and destruction of households, supplies have been affected.

Table 6: Retail Outlets by District – Damages and Loss of Inventory

Unit	Muzaffarabad	Rawalakot (Poonch)	Bagh	Abbottabad	Mansehra	Kohistan	Batagram	Shangla	Other	Total*	
Petroleum Sub-sector											
Total Retail Outlets	No.	12	9	8	13	10	4	3	3	6	68
Damaged Retail Outlets	No.	4	1	1	0	3	0	0	0	1	10
Loss of Inventory	000 L	10	0	0	0	0	0	0	0	0	10
Damage to Facilities	M Rs	30.70	7.59	7.59	0.00	22.77	0.00	0.00	0.00	7.59	76.24
Value of Inventory	M Rs	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Sub-total	M Rs	31.15	7.59	7.59	0.00	22.77	0.00	0.00	0.00	7.59	76.69
LPG Sub-sector											
Distrib/ Agents affected	No.	15	4	3	5	8	2	2	0	7	46
Loss of Inventory	MT	22.37	2.95	3.53	2.94	9.43	1.18	0.59	0	23.53	66.52
Damage to Facilities	M Rs	6.45	1.72	1.29	2.15	3.44	0.86	0.86	0	3.01	19.78
Value of Inventory	M Rs	0.89	0.12	0.14	0.12	0.38	0.05	0.02	0.00	0.94	2.66
Sub-total	M Rs	7.34	1.84	1.43	2.27	3.82	0.91	0.88	0.00	3.95	22.44
Grand Total	M Rs	38.50	9.43	9.02	2.27	26.59	0.91	0.88	0.00	11.54	99.13

Note: Muzaffarabad, Rawalakot and Bagh are in AJK; Abbottabad, Mansehra, Kohistan, Batagram, Shangla and Others are in NWFP.

Source: OMC / LPG company estimates.

25. The Government and OMCs have taken adequate measures to ensure that there is no immediate shortage of fuel for the transport fleet engaged in relief work. Natural gas networks in Abbottabad and Mansehra areas were thoroughly checked after the earthquake, and supplies restored to normal levels soon thereafter. LPG supplies have been affected, however as consumption of LPG is directly dependent on the rehabilitation of the population in their permanent abode. Currently, the population in tent villages is using firewood for cooking, but there is concern regarding the affordability and sustainability of supplies during the coming winter months.

C.2 Reconstruction and Recovery Strategy

26. Based on the assessment of damage, the following three strategic measures need immediate consideration: (a) repair and rehabilitation of LPG and liquid fuels distribution infrastructure damaged by the earthquake; (b) development and finalization of a program of fuel supplies during the winter months, including *inter alia* LPG supplies to the tent villages, diesel for stand-alone generators, firewood supplies for remote locations, etc; and (c) creation of some LPG bottling and petroleum products storage infrastructure in the affected Districts. In terms of reconstruction approach, it is expected that the private sector companies, both petroleum and LPG, will ensure that sufficient capacities will be established in accordance with growth in demand. The Government would need to consider payments (full or partial), where applicable, for fuels delivered to ensure continued supply.

27. **Short Term Priority (up to 18 months).** The short term needs could be considered as comprising of the first two measures of the strategic plan described in para. 23. Table 7 provides details of major cost elements.

Table 7: Short-term needs of the Fuel Sector (0 -18 months)

Reconstruction & Recovery Action	Physical Quantity	Estimated Cost (Rs. Mill.)
Repair to petroleum retail outlets	4 in NWFP; 6 in AJK	76.20
Rehabilitation of LPG distributors	24 in NWFP; 26 in AJK	19.80
Cost of free supply of LPG to tent villages	10 villages -20 cylinders/day for 180 days	17.92
Cost of free diesel for 30 generators in tent villages	25 KW generators, operating for eight hours/day for 180 days @ 0.5 Kg/Kwh	25.00
Cost of immediate tanks, etc	4 tanks of 10 MT each	0.72
Total		138.64

Source: Mission estimates

28. **Medium to Long Term Priorities (18 months to 3 years).** In the medium to long term, AJK and NWFP Districts need to develop strategic stocks of petroleum products and LPG so that it could meet its needs for at least one month in case of natural calamities. This would be in the form of a fleet of bowzers to transport bulk-product (LPG and petroleum products) to one central depot in AJK and Mansehra, one LPG bottling facility in Rawalakot and Shangla, and a number of new retail outlets in locations currently not served with commercial fuels. A preliminary cost estimate of these needs is provided in Table 5,

Table 8: Medium and Long term needs of the Fuel Sector (18 months -3 years)

Reconstruction & Recovery Action	Physical Quantity	Estimated Cost (Rs. Mill.)
Petroleum and LPG strategic storage	For one month cover	50.00
Bowzers for transport of wholesale product	10 bowzers @ Rs 5 million each	50.00
LPG bottling facility	2x20 TPD facility (Rs. 70 million each)	140.00
New retail outlets	30 new outlets (Rs. 5 million each)	150.00
Total		390.00

Source: Mission estimates.

D. Environmental and Social Aspects

29. Primarily it is the power distribution networks in the affected areas within AJK and NWFP that need to be rehabilitated, and no significant adverse environmental and social impacts are anticipated in the energy sector. In terms of any further expansive reconstruction efforts in the medium and long terms appropriate national and provincial environmental and social impacts legislation and guidelines will have to be adopted.

30. In terms of the petroleum sector the initial inspection of fuel storage facilities revealed limited damage, and accordingly relatively limited adverse environmental impacts. However, it is suggested that a more detailed examination of fuel storage facilities take place in the near future in order to establish the actual adverse environmental impacts, but more importantly to ensure that there is no future leakage/loss of petroleum products.

ANNEX 13 – AGRICULTURE, LIVESTOCK AND IRRIGATION

A. Introduction

1. Most of the rural population in AJK and NWFP is engaged in subsistence agriculture. Winter (*rabi*) crops are mainly rainfed, while summer (*khariif*) crops rely on surface irrigation. For the majority of households, the share of agricultural income in the total household income varies between 60 to 70 percent, and a major source of household income is employment in services, trading, construction and industrial sectors, in urban and industrial areas, locally or elsewhere in the country. The main crops include maize, wheat, paddy, fruits, vegetables, and fodder for livestock. Livestock and poultry, generally tended by women, are an important source of nutrition and the main savings instrument to meet emergency cash requirements.

2. The earthquake caused major physical damage to the agriculture sector, including standing and harvested crops, stored seed and grains and animal feed, implements and tools, livestock and poultry, irrigation sources and channels, terraces, soil conservation structures, and some damage to fruit trees, and physical damage to service-related civil works. The loss, if not mitigated in time, will likely further aggravate not only the direct damage but also the indirect damage to the production capacity, further impairing the food security and livelihoods while generating severe social and environmental consequences in the watershed itself and in downstream areas.

B. Damage Overview and Recovery Needs

3. The damage and needs assessment was undertaken in the three most severely damaged districts in Azad Jammu and Kashmir (AJK) and five districts in North West Frontier Province (NWFP). The methodology of the assessment is based on the Handbook for Estimating the Socio-Economic and Environmental Effects of Disasters published by Economic Commission for Latin America and the Caribbean, the United Nations.

4. This assessment is based on the preliminary damage assessment data compiled by the respective Governments, District Governments, and the concerned line agency staff, and aerial and ground visits to the affected areas by the ADB/World Bank-led assessment and FAO teams. The assessment also relies heavily on information compiled by FAO field teams, which was used to validate other observations through extensive discussions with the field staff and scoping sessions with affectees. The field teams confirmed the extensive direct and indirect damage and identified various issues that need immediate attention.

5. Based on the assessment, total direct damage to the agriculture sector in AJK and NWFP, including crops, livestock and irrigation, is estimated at Rs. 13,257 million (US\$223.2 million). Crop damage includes harvested and standing crops and byproducts, losses to terraces, farm stores, and feeds, and extension and research buildings. Damage to the livestock sector was also severe, including loss of large and small ruminants and poultry, animal sheds, and extension and research buildings.⁴² Irrigation infrastructure, including water channels, diversions, water lifts, spillways, and water tanks was also damaged. Indirect damage to the agriculture sector includes production losses of fruit trees and milk, and anticipated decrease in yields in the forthcoming wheat crop. The recovery needs for the agriculture sector are estimated at Rs.18,469 million (US\$311 million). The immediate requirements (in the next one month) are for inputs for winter crops and establishment of temporary animal sheds for protection during the approaching winter. There is also an immediate need to restore buildings of relevant line agencies and rehabilitation of irrigation facilities to enable a rapid resumption of services to affected people. Long

⁴² About 133,500 cattle and 107,700 buffalos have been lost.

term needs include restoring livestock inventories and rehabilitation of terraces. Longer term recovery plans also call for measures to improve sustainability of the sector through strengthening institutional capacities and providing enhanced support services. Table 1 presents a summary of the direct and indirect damage and needs, including relief and support for revitalizing farm production and related economic activities.

**Table 1: Damage and Needs in the Agriculture Sector
(in Millions)**

Area	Sub-sector	Direct Damage	Indirect loss	Total Loss	Reconstruction Cost
Total of Agriculture Sector					
	Crop	3,956.0	711.8	4,667.8	5,953.6
	Livestock	8,976.8	6,058.6	15,035.4	11,892.2
	Irrigation	323.8	-	323.8	623.2
	Total (in Rs. million)	13,256.6	6,770.4	20,027.0	18,469.0
	(in US\$ million)	223.2	114.0	337.2	310.9
Azad Jammu and Kashmir					
	Crop	3,209.2	529.0	3,738.2	5,345.9
	Livestock	5,043.0	3,688.6	8,731.6	7,133.3
	Irrigation	240.1	-	240.1	472.0
	Subtotal (in Rs. million)	8,492.3	4,217.6	12,709.9	12,951.2
	(in US\$ million)	143.0	71.0	214.0	218.0
North West Frontier Province					
	Crop	746.8	182.8	929.6	607.7
	Livestock	3,933.8	2,370.0	6,303.8	4,758.9
	Irrigation	83.7	-	83.7	151.2
	Subtotal (in Rs. million)	4,764.3	2,552.	7,317.1	5,517.8
	(in US\$ million)	80.2	43.0	123.2	92.0

6. The following sections describe in greater detail the initial direct and indirect damage estimates for AJK and NWFP and estimated needs restore the crop, livestock and irrigation subsectors to the pre-earthquake levels.

Azad Jammu and Kashmir

Direct damage

7. It is estimated that the AJK suffered total direct damage of about Rs. 8.5 billion (US\$141.5 million). The bulk of the damage was in the livestock subsector (Rs. 5.0 billion or US\$84.1 million), followed by crop subsector estimated at Rs. 3.2 billion (US\$53.5 million), and irrigation structures Rs. 240 million (US\$4.0 million).

8. In the case of livestock, it is estimated that about 30 percent of the large ruminants and about 18 percent of the small ruminants were either killed or injured severely enough to be of no productive use and therefore needed to be culled. Most of these losses were sustained in the collapse of animal sheds, the near total destruction of which also constitutes a major blow. The assessment team also reported that the death of animals continues as a result of the absence of shelter for animals to be kept at night.

9. In the case of crops, the main damage was to harvested crops that were still in the field for threshing, cleaning and drying. Affected crops included just harvested and/or ready to harvest maize and paddy, *kharif* fodder, and some damage to fruit trees. Straw (a byproduct of maize and paddy) was also damaged. Damage was primarily caused by landslides, followed by occasional rains, aftershocks, delayed harvest, unattended or roaming livestock, and unavailability of harvest labor, family or hired, who were either injured or moved away for safety. Other direct damage includes loss of wheat seed, stored grain and animal feed, animal sheds, implements and tools, irrigation structures, terraces, and other infrastructure.

10. Damage to productive infrastructure includes irrigation structures (water channels, ponds and tanks, diversion structures, lifts, etc.). Rapid restoration of these structures is important to enable rapid resumption of cultivation. It is estimated that the total value of the civil works is about Rs. 240 million, while the cost of reconstruction is estimated at Rs. 472 million. The above are conservative estimate and may increase after a detailed survey and inspection.

Indirect losses

11. The preliminary estimate of the indirect losses is about Rs. 4.2 billion (US\$70.3 million). The major loss is accounted for by loss of production of milk and dairy products due to significant loss of milk animals, and egg production due to loss of poultry. The livestock, especially (cows, buffalo, and goats) not only provides milk for the household, they are also a source of farm yard manure, and dung cakes that are used as fuel.

12. Although damage to fruit trees was relatively small at about 3 to 4 percent of trees, the high value of the crop means that the damage is significant in terms of value of production forgone. It is estimated that the annualized value of the fruit production is about Rs. 225 million.

13. Most of the farmland is self-cultivated. However it also provides significant employment to the landless households that are normally engaged for land preparation, sowing, and harvesting. These household have lost the employment opportunities due to damage to crops. It is estimated that the loss of wages from the current crop is about Rs. 300 million.

Needs

14. Total costs to restore the agriculture sector are estimated at about Rs. 13.0 billion (US\$218 million). Immediate requirements that need to be met in the next month is wheat seed, fertilizers, support for land preparation, and construction of temporary animal sheds and is estimated at Rs. 1.8 billion (US\$30.3 million) of which animal sheds alone would cost about Rs. 1.4 billion (US\$22.9 million). Similarly, Rs. 1.8 billion (US\$30.9 million) is needed within the next 18 months mainly to restore buildings of the relevant line agencies and to rehabilitate the irrigation related infrastructure. Long term needs are estimated at Rs. 9.4 billion (US\$157.8 million) mainly to restore the livestock inventory and to rehabilitate terraces and associated soils conservation structures.

North West Frontier Province

Direct damages

15. Total direct damage in NWFP is estimated at about Rs. 4.8 billion (US\$80.2 million). As in AJK, the bulk of the damage was experienced by the livestock subsector (Rs. 3.9 billion or US\$66.2 million), followed by the crop subsector estimated at Rs. 747 million (US\$12.4 million), and irrigation structures at Rs. 84 million (US\$1.4 million).

16. In the case of livestock, it is estimated that about 20-25 percent of the large ruminants and about 20 percent of the small ruminants were either killed or injured severely enough to be of no productive use and therefore needed to be culled. Most of these losses were sustained in the collapse of animal sheds the near total destruction of which also constitutes a major blow. The assessment team also reported that the death of animals continues as a result of the absence of shelter for animals to be kept at night.

17. In the case of crops, the main damage was to harvested crops that were still in the field for threshing, cleaning and drying. Affected crops included just harvested and/or ready to harvest maize and paddy, *kharif* fodder. Straw (a byproduct of maize and paddy) was also damaged. Damage was primarily caused by land slides, followed by occasional rains, aftershocks, delayed harvest, unattended or roaming livestock, and unavailability of harvest labor, family or hired, who were either injured or moved away for safety. Other direct damage includes loss of wheat seed, stored grain and animal feed, animal sheds, implements and tools, irrigation structures, terraces, and other infrastructure.

18. Damage to productive infrastructure includes irrigation structures (water channels, ponds and tanks, diversion structures, lifts, etc.) and field terraces with soil conservation structures. Rapid restoration of these structures is important to enable rapid resumption of cultivation.

Indirect losses

19. The preliminary estimate of the indirect losses is about Rs. 2.6 billion (US\$42.5 million). The main loss is production of milk and dairy products, amounting to Rs. 2.4 billion (US\$39.5 million), which is due to significant loss of milk animals, and egg production due to loss of poultry, followed by estimated decline in wheat production estimated at Rs. 183 million (US\$3.0 million).

20. Most of the farmland is self-cultivated. However it also provides significant employment to the landless households that are normally engaged for land preparation, sowing, and harvesting. These household have lost the employment opportunities due to damage to crop. It is estimated that the loss of wages from the current crop is about Rs. 200 million.

Needs

21. Total recovery needs for the agriculture sector are estimated at about Rs. 5.5 billion (US\$91.8 million). Immediate requirements include wheat seed, fertilizers, support for land preparation, and construction of temporary animal sheds which would cost a total of about Rs. 1.5 billion (US\$26.3 million), of which animal sheds alone would cost Rs. 1.1 billion (US\$18.2 million). Similarly, Rs. 0.1 billion (US\$1.9 million) are needed within the next 18 months mainly to restore the buildings of the relevant line agencies, and to rehabilitate the irrigation related infrastructure. The long term needs would cost Rs. 3.9 billion (US\$66.2 million), and mainly include restoring the livestock inventory requiring Rs. 3.6 billion (US\$60.3 million), and rehabilitation of terraces and associated soils conservation which would cost about Rs. 359 million (US\$6.0 million).

C. Reconstruction and Recovery Strategy

Approach

22. The overall approach to recovery in the agriculture sector is to protect against further loss during the coming winter while providing assistance to farmers to resume farming as soon as possible. The strategy will require a well-coordinated delivery mechanism with adequate logistic support. Special attention will be accorded to very poor and marginal communities, women-headed families, and orphans. At present both the landowning farm households and the landless farmers have relocated themselves to safer places away from their normal abode. Some of the families who have a close relative working in

urban areas, within AJK/NWFP or elsewhere in the country, have migrated to these places. They need to be encouraged to come back to settle through monetary and physical support to build their houses and animal sheds, and start farming.

Critical Issues

23. The main approach for the reconstruction and rehabilitation of the agriculture sector focuses on short term measures, such as resettlement of livestock in temporary shelters followed by supply of seed and fertilizer to catch the fast approaching *rabi* season, and restoration of irrigation supplies. Providing shelter for animals is a critical priority, as lack of shelter and extreme cold could lead to further severe losses of remaining livestock and further damage to livelihoods. Farm families who have lost implements and tools would also need to these to restart farming operations. In the medium to long term, they would be provided support to diversify their cropping pattern and replant lost orchards.

Short term Strategy

24. In the short term, farmers who have lost animals, especially landless farmers, would be provided with animals to improve their nutrient status and provide support to livelihoods. In addition, support to farmers would focus on building improved, earthquake-safe livestock sheds. The repair of civil structures, namely, office and residential buildings, research laboratories, field offices, etc. would be restored in phases. The irrigation channels needs to be restored by the *Kharif* season, otherwise the cultivation of maize, paddy, vegetables, and fruits will be severely hampered.

Medium to Long term Strategy

25. Similarly, in the medium and long term, the agriculture, livestock, and irrigation departments which have traditionally been weak (and have been weakened further by the disaster) will need to be restored and strengthened in order to revitalize the farm sector. Hence, the civil structures for agriculture and livestock extension, research, and veterinary facilities need to be restored to assist the farmers in maintaining yield levels that were realized prior to the earthquake. The animal sheds need to be reestablished with earthquake resistance measures.

D. Environment and Social Aspects

26. Some adverse environmental impacts are expected as a result of the disaster. Increased and possibly indiscriminate felling of trees for shelter and fuel wood is expected to result in damage to watersheds. Damage to soil conservation structures can be expected to increase the risk of landslides during the rainy seasons.

27. Landless households are particularly vulnerable to hardship as a result of the earthquake. Providing employment opportunities and safeguarding livestock (an important source of income and nutrition) will be important to avoid severe loss of livelihood and deepening poverty. The capacity of the concerned departments of the Provinces needs to be strengthened for implementation of the rehabilitation and reconstruction activities, especially programs that provide employment through non-government organizations. Restoring livestock shelters is also important in this regard.

ANNEX 14 – INDUSTRY AND SERVICES

A. Introduction

1. The private sector in NWFP and AJK is largely dominated by medium, small-scale and unregistered enterprises, which are often household-based. Even where the primary proprietor of the business has survived, these enterprises will have, in many cases, lost all or most of their business assets. While the monetary value of the individual losses may not be substantial, the collective impact is significant. Many of these businesses were not only suppliers of basic commodities, but also provided additional services such as pay-points for informal remittance transfers.

2. The wholesale and trade sector in NWFP and AJK contribute nearly 11.6% and 49.7% to GDP respectively, or Rs. 12.2 billion and Rs. 15.8 billion. Prior to the earthquake the sector employed 59,482 people in NWFP and 29,350 in AJK. The assessment team estimates that direct asset damage and output losses (indirect losses) in the services sector are Rs. 8,578 million and Rs. 6,076 million respectively. The employment loss for the services sector is estimated at 41,699.

3. *Consultations and site visits.* Consultations were held with institutions/individuals directly involved in the financial and private sector and with their clients. The Small and Medium Enterprise Development Authority (SMEDA), the AJK Chamber of Commerce and Hazara Chamber of Commerce, relevant census reports, representatives of district, provincial and federal level governments, and site visits to the areas all contributed to the needs assessment. With respect to the financial sector, the State Bank of Pakistan, the Khushaali Bank, Rural Support Programs (NRSP & SRSP), House Building Finance Cooperation, Central Directorate for National Savings and the Post Office were also consulted.

B. Damage Overview and Recovery Needs

4. *Methodology.* Due to the informal nature of the sector, estimating losses is difficult. To arrive at the number of shops destroyed a proxy was used based on the percentage of houses that were damaged for each of the districts with a distinction made for partially and totally destroyed. The number of commercial electricity connections served as the baseline for the number of business activities and an average value was calculated for a typical establishment both for construction material and for inventory. Since trade is an activity whose primary function is provision of services, output losses or indirect losses are referred to as the losses incurred during the interruption of business. Damage to infrastructure, loss in inventory and working capital, labor shortage and loss in purchasing power of the community for consumer goods all contribute to the indirect losses. A complete assessment of asset losses in the services sector is yet to be completed.

5. *Trade Related Impact.* All eight affected districts saw impacts to retail, restaurants and wholesale warehousing. Mansehra District in NWFP, which contains the tourist towns of Kaghan, Naran and Balakot, had significant damage to its tourism infrastructure. Similarly in Muzaffarabad District in AJK the handicraft sector was adversely affected. Asset damage and loss includes both structures and inventories.

Table 1: Estimate of Damage to Assets and the Reconstruction Cost

Type of Damage	Direct Damage Rs. Million	Reconstruction Cost
1. Commercial Building (totally and partially damaged at <i>book value</i>)		
Trade, marketplaces, restaurants	1,315	1,875
Financial Sector	111	151
2. Goods, Inventory, Equipment, working Capital		
Trade, marketplaces, restaurants	6,842	6,842
Financial Sector	310	310
Service Sector Direct Damage	8,578	9,178

* Reconstruction costs are assumed at 5% higher for completely destroyed buildings and 20% higher for partially destroyed buildings in order to incorporate seismic-resistant design standards.

Table 2: District Wise Break Down of Damage Estimates to Trade Sector

District	# of Establishments	Damaged (Totally and Partially)	Direct Damage (Rs. mill.)	Urban (Rs. mill.)	Rural (Rs. mill.)
NWFP			4120	189	3931
Abbottabad	10449	2090	598	107	491
Batagram	3236	2363	995	-	995
Kohistan	5010	1353	382	-	382
Mansehra	14073	4503	1544	82	1462
Shangla	4579	1557	600	-	600
AJK			4037	465	3572
Bagh	3280	2624	1009	56	953
Muzaffarabad	7868	5508	2251	307	1944
Poonch	3468	2601	777	102	675
Total Damage			8157	654	7503

6. **Financial sector impact.** With regard to the formal financial sector, most of the commercial bank branches were mainly serving as deposit taking institutions and had limited lending to the commercial sector; thus, damage to their loan portfolios is limited. Of the 230 branches operating in the area 18 suffered severe damage and collapsed in the earthquake, with 14 of those collapsed in AJK and 4 in NWFP. According to the State Bank of Pakistan, close to two hundred bank branches have resumed normal operations.

7. Microfinance institutions, remittances and unregulated borrowing were the main conduits for finance in the affected areas. For microfinance institutions, the sectors with the most lending were livestock, micro-enterprises, agriculture and at times, working capital. These institutions are significantly affected. For example:

- Sarhad Rural Support Programme and Khushali Bank, the two dominant players in the affected areas in NWFP, have estimated losses of Rs. 29.5 million from an outstanding balance of Rs. 38.7 million.

- In AJK it is estimated that the entire portfolio of Khushali Bank in the affected areas (2,747 clients and Rs. 17.4 million) has been adversely impacted.
- In the areas of Bagh, Rawalakot and Kotli in AJK the National Rural Support Program has a portfolio of Rs. 42.3 million which is adversely affected.
- On housing finance, the House Building Finance Corporation early estimates show that of a total outstanding portfolio of Rs. 763 million linked to 5,063 clients, approximately Rs. 217.3 million is affected.

C. Reconstruction and Recovery Strategy

8. In the short term, the aim must be to restore the abilities of businesses to restock basic supplies and re-engage in commerce. Restoring basic infrastructure, including primary residences and facilitating access to financial resources—from domestic and foreign remittances, microfinance institutions, and banks—is an essential first step. The key role of the Government will be to create an enabling environment which will allow entrepreneurs to quickly rebuild their businesses. It will also be useful for Government to ensure that relief material is procured from the local areas when possible. The risk of shortages and inflation will increase if the retail sector does not return to normalcy in the near term.

Critical Issues

9. ***Physical and social infrastructure.*** Restoring the region’s basic physical and social infrastructure is the key for improving the rate of re-establishing commerce. In particular it is important to focus on rebuilding roads, re-establishing power and water connections and ensuring communications links.

10. ***Access to finance.*** The financial situation in NWFP and AJK will be made more difficult as banks historically shy away from small and medium enterprises as they are considered risky ventures. Often, collateral requirements crowd out many smaller entrepreneurs. Further, entrepreneurs and enterprises that operate informally cannot borrow at a reasonable cost because they do not have legal status or title to the land they occupy. Frequently, the only option for access to capital is through informal moneylenders who charge high rates and who may be able to lend only small sums relative to the needs of an enterprise. These factors will increase the complexity of ensuring access to financing for the region’s small businesses.

11. ***Access to finance in the short term (up to 12 months).*** Creating channels for the delivery of sustainable credit programs in post-disaster areas is challenging as recipients will expect grants from government and the international donor community. It is therefore essential that a clear distinction is made between emergency grant-based programs aimed at restoring basic living conditions, and longer term financial resources aimed at restoring income generating livelihoods. Grant programs will need to be carefully designed, relying on international best practices, to minimize potential negative effects (such as undermining local financial institutions).

12. In the short term public finance can bridge some gaps in financing, but public financial assistance programs must complement, rather than compete with, private financing. While in the immediate aftermath of the earthquake grants may be provided to the severely hit micro and small entrepreneurs, later in the recovery period there should be a shift to mainly market-based loan products, as subsidized credit programs will be unsustainable. New financial products would better serve small and medium enterprises with tailored lending and savings products.

13. Efforts should focus on using existing institutions rather than creating dedicated state agencies. A mapping of non-microfinance NGOs – and Microfinance Institutions if the first are not available – from which grants would be managed will be needed. A mapping of both banks and non-banking institutions from credit programs can later be managed is also essential.

Medium to long term (12 months to 5 years)

14. Options for providing financial resources to firms may include:

- ***A Micro and Small Enterprise (MSE) lending facility.*** MSE lending windows could be created within interested (and eligible) existing financial institutions. Depending on the liquidity situations of these financial institutions, credit lines targeted at micro and small enterprises (following the EBRD model used in the Former Soviet Union and the Balkans) could be made available. These credit lines would need to be accompanied by resident technical advisers to help banks develop their MSE lending skills (i.e., developing financial products and procedures adapted to MSEs, moving from collateral based lending to cash flow and character based lending, decentralizing credit decisions, strengthening Management Information System, developing marketing and incentives for loan officers, etc.). Grant funding covers the technical assistance, including marketing, salaries and bonuses of loan officers for up to 6 months. If liquidity is not a constraint for financial institutions, technical assistance could be offered.
- ***Microfinance.*** A large number of small and informal businesses in the affected regions are likely to have accessed credit through non-commercial bank sources. It will be important for small business credit programs to be channeled through these organizations. Though the business environment may seem risky, it is important to adhere to good microfinance practices and core principles such as high portfolio quality, market interest rates and full cost-recovery pricing. MFIs should lift compulsory savings requirements in affected branches during the initial stages of reconstruction. This gives MFIs the opportunity to rebuild branches and locate clients. Reconstruction loans are also most effective once the relief stage is over, though they need to be monitored carefully as these loans do not generate regular cash incomes.

Technical Assistance

15. While it is unlikely that enterprises will require sophisticated technical assistance given the basic nature of their commercial enterprises, they could benefit from, for example, developing business plans, improving inventory management and strengthening financial management. Additionally, given that rural areas are most affected, efforts must be made to better link rural markets.

16. In re-establishing the private sector in affected areas, efforts should be made to partner with entrepreneurial networks and associations. There could play an important role in assisting banks in developing financial products answering the needs of MSEs. There is significant interest from domestic and international companies to assist in the economic recovery of the affected region. There is recognition by the private sector that they need to remain engaged in the disaster region for a number of years. Some companies are participating in ‘adopt a village’ schemes. Resources and know-how from linkages with firms in other parts of the country and outside the country need to be formalized. The challenge lies in how to institutionalize these efforts to ensure long term commitment.