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 map at the end of this report). 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 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 km^2) 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 1 on next page: Areas Most Affected by the Earthquake**).

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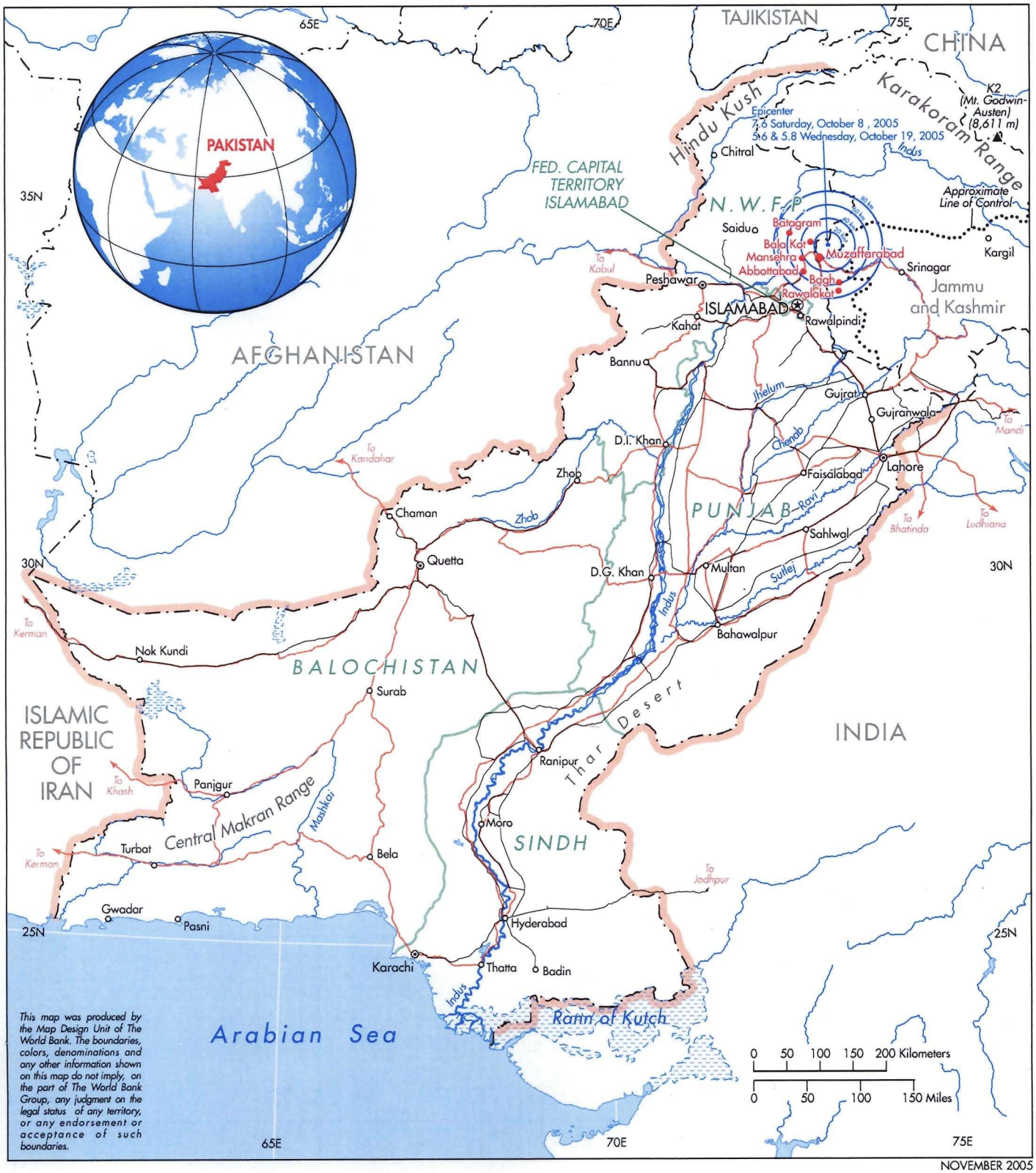
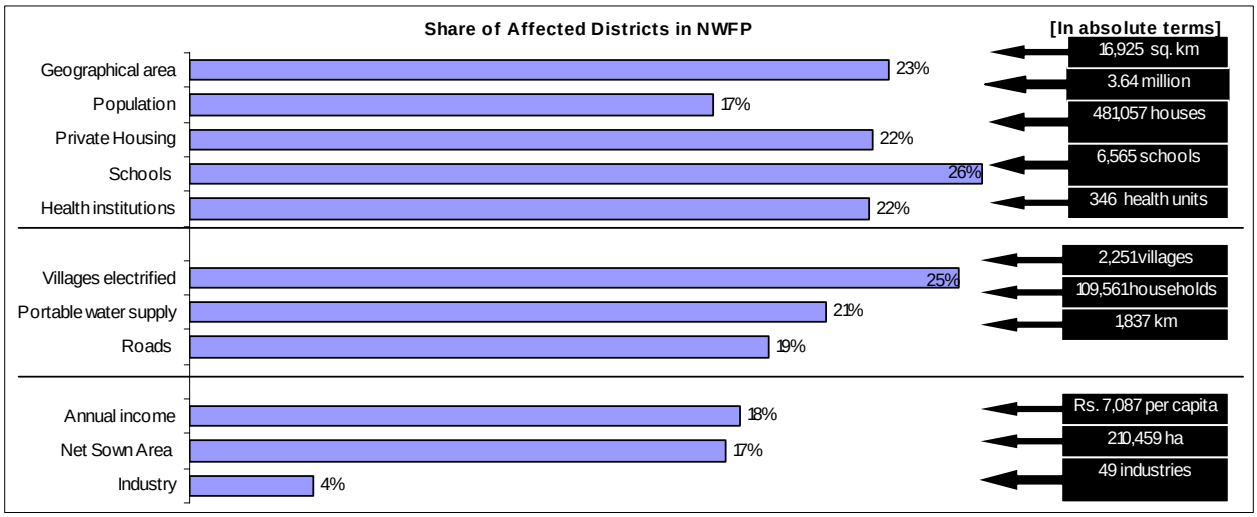


This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

NOVEMBER 2005

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

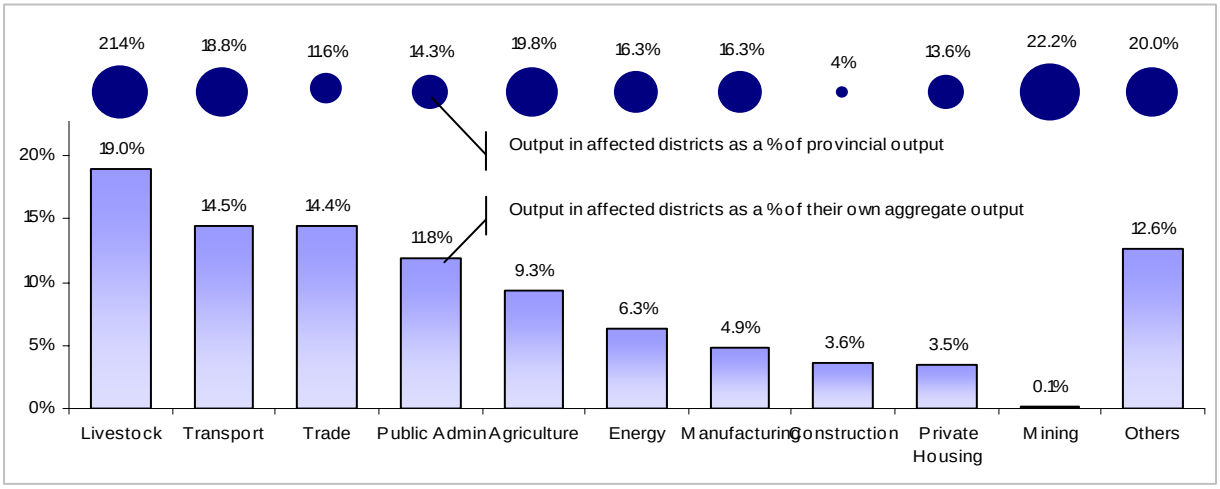


Source: World Bank staff estimates.

7. The affected districts in AJK account for 63 percent of its geographical area (which is equal to 8,340 km^2) 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 2, 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 2: 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 form 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. 135.1 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. 58.7 billion (US$989 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	58,771	16,516	91,467	1,540	44
o/w : Public Assets	48,131	12,175	82,187	1,384	39
: Private Assets	87,015	22,012	125,904	2,120	61
o/w : Urban Areas	26,490	13,675	46,163	777	22
: Rural Areas	108,656	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.
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Indirect Losses

14. The indirect losses resulting from the direct damage estimated above are Rs. 34.2 billion (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.

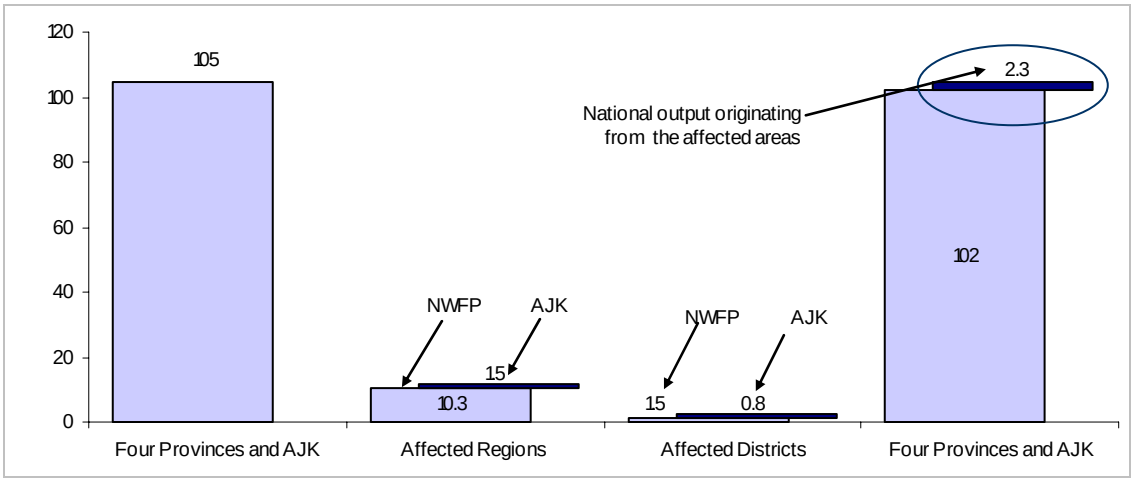
Real Sector

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 2, 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.

[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.

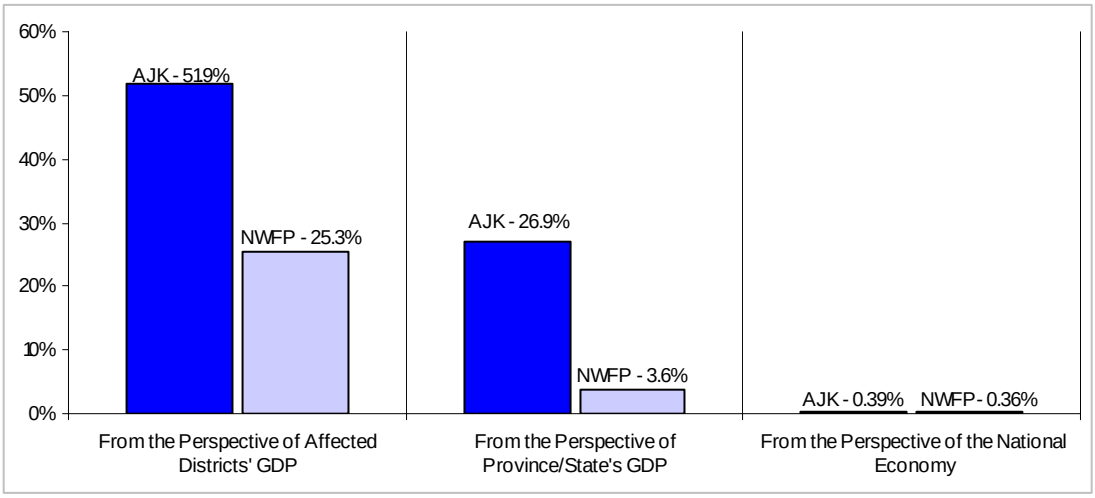
Figure 2: Output Originating from the Affected Regions and Districts, billions of $US



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 3)

Figure 3: 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.