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Highlighting Poverty as Vulnerability: The 2005 Earthquake in Pakistan

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Introduction

The 8 October 2005 earthquake in Pakistan is believed to be one of the worst to hit the region in recent memory. This policy brief outlines scenarios for the potential poverty impact of the earthquake on Pakistan. Given the extent of destruction of physical infrastructure and housing, traditional reconstruction efforts will undoubtedly be needed as soon as the emergency phase of this disaster is over. However, we argue that the traditional “bricks-and-mortar” rebuilding approach will likely not be enough to ensure economic resettlement and recovery in the region. Given the trauma associated with the earthquake, and the likelihood of increased risk aversion in the affected population, social protection policies must play a central part in any earthquake recovery package.

The Earthquake

The epicenter of the earthquake was about 60 miles northeast of Islamabad, close to Muzaffarabad in Azad Jammu and Kashmir (AJK); see map in Figure 1. Although the full extent of casualties is as yet unknown, more than 54,000 people are reported to have been killed. This number is set to rise, and the numbers of those injured is also expected to be very high. The United Nations estimates that 2 million people were rendered homeless. In addition to loss of life and injuries, widespread damage to housing and infrastructure has been reported: the government estimates infrastructure losses to the tune of US$5 billion. News reports suggest that the city of Muzaffarabad was one of the hardest hit with almost 70% of the houses and buildings destroyed. Rescue efforts have been hampered by coordination problems as well as by the mountainous terrain. And given widespread destruction to health facilities and housing, and the inhospitable climate in the region, there are concerns regarding exposure and outbreaks of diseases and other health-related problems. India and, to a lesser extent, Afghanistan have also been affected by the earthquake.

In addition to Muzaffarabad, other districts in AJK and those in the adjoining North West Frontier Province (NWFP) have borne the brunt of the earthquake impact. Table 1 shows estimates of the total
population in selected districts in NWFP and AJK: these numbers are indicative of the rough magnitude of those most at risk of suffering in the aftermath of the earthquake.

**Economic Impact Considerations**

In order to think through economic reconstruction, we would need to first assess what some of the characteristics of the affected population are. Pakistan is a low-income country. It has an income per capita of only about US$600.\(^1\) In the past couple of years or so, overcoming economic setbacks in the 1990s, the country posted relatively strong economic growth numbers (4–6% in real terms).

Data limitations make it difficult to assess clearly what the situation was in the affected districts prior to the earthquake (e.g., the latest household survey we have access to is from 2001/2002). We do know that NWFP, especially the rural regions, has relatively low

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\(^1\) 2004 GNI per capita (Atlas method) number from *World Development Indicators* (World Bank 2005).
Table 1. **Population in Selected Earthquake-affected Districts of Pakistan**

<table>
<thead>
<tr>
<th>District</th>
<th>Province/Region</th>
<th>Population</th>
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</thead>
<tbody>
<tr>
<td>Mansehra</td>
<td>NWFP</td>
<td>1,356,000</td>
</tr>
<tr>
<td>Batagram</td>
<td>NWFP</td>
<td>361,000</td>
</tr>
<tr>
<td>Abbottabad</td>
<td>NWFP</td>
<td>999,557</td>
</tr>
<tr>
<td>Shangla</td>
<td>NWFP</td>
<td>541,000</td>
</tr>
<tr>
<td>Kohistan</td>
<td>NWFP</td>
<td>475,000</td>
</tr>
<tr>
<td>Muzaffarabad</td>
<td>AJK</td>
<td>904,950</td>
</tr>
<tr>
<td>Poonch</td>
<td>AJK</td>
<td>479,854</td>
</tr>
<tr>
<td>Bagh</td>
<td>AJK</td>
<td>451,013</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>5,568,374</strong></td>
</tr>
</tbody>
</table>

Sources: NWFP government official website for NWFP districts except for Abbottabad. Staff estimates for Abbottabad and AJK districts are based on official growth rates.

human development indicators (see UNDP 2003 and Figure 2, which shows literacy and income by province). Some additional information can be gleaned from available household data. Figure 3 shows, for instance, the distribution of employment status in NWFP: most in the sample are either self-employed or unpaid family helpers, underscoring the predominance of household enterprise production in the region.\(^2\) Hence, losses of income due to deaths of household members and physical disabilities are likely to be major factors in economic impact considerations.

The key point to underscore is that given the nature of human capital and employment characteristics, economic rehabilitation of the population in the earthquake-affected districts is not going to be easy: these are not individuals who can easily be migrated to urban areas, for instance, for resettlement and absorption elsewhere in the economy.

\(^2\) Note that these numbers are from the Pakistan Household Integrated Economic Survey (HIES) 2001/2002. However, the situation is unlikely to be very different in 2005.
Figure 2
Literacy Rates and Income by Province/Region in Pakistan


Figure 3
Distribution of Employment Status in NWFP in Pakistan

At this stage, a comprehensive assessment of the economic impact of the earthquake is not feasible. The immediate focus is (and should be) on provision of emergency help, health care, and temporary resettlement efforts. In the short to medium term, it is clear that the microeconomic impact of the earthquake will be substantial in the affected regions. Recent estimates based on conditions prevailing prior to the earthquake reveal $1-a-day or "extreme" poverty afflicting about 14% of Pakistan’s population (approximately 21 million). A much larger proportion of the population—almost 70%, numbering over 105 million—has been living in $2-a-day poverty. This is indicative of the fact that a large proportion of the population is at the margin: not very well-off to begin with, vulnerable, and very much at risk of falling into extreme poverty. Of course, conditions in individual regions within Pakistan may differ. Therefore it is important to examine conditions in the two affected regions specifically.

**Poverty: Some Scenarios on the Impact of the Earthquake**

Estimates of poverty based on the HIES 2001/2002 suggest that while the incidence of extreme poverty ($1-a-day poverty) was relatively low in NWFP and especially AJK prior to the earthquake, poverty incidence as measured by the $2-a-day poverty line was not only substantial, but in the case of NWFP, higher than that in the country as a whole. This can be seen quite clearly in terms of the large differences in poverty rates across columns 1 and 5 of Table 2, and indicates the considerable degree of vulnerability of a large fraction of the population to shocks.

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3 A note on the macro-level economic impact: increased emergency and reconstructive public expenditure could have potentially inimical effects on public debt in Pakistan (the government had forecast a fiscal deficit of 3.8% of GDP for this year). Direct (short-term) macro-level output effects of the earthquake, however, are not expected to be significant given that the impact of the earthquake on industrial centers in Faisalabad, Karachi, Lahore, and Sialkot has been minimal.


5 Data on private consumption expenditures (PCE) from national accounts indicate that PCE in 2004, the most recent year available, was virtually identical to that in 2001. Given that the distribution of expenditures across households is typically slow to change, the HIES 2001/2002 seems therefore to provide a good basis for inferring poverty prior to the earthquake.
Table 2. Poverty Impact of Earthquake in Affected Provinces: Headcount Ratio  
(number of poor in ‘000s in parentheses)

<table>
<thead>
<tr>
<th>Province</th>
<th>Original ($1-a-Day)</th>
<th>Worst-Case Scenario ($1-a-Day)</th>
<th>50% Reduction ($1-a-Day)</th>
<th>25% Reduction ($1-a-Day)</th>
<th>Original ($2-a-Day)</th>
<th>50% Reduction ($2-a-Day)</th>
<th>25% Reduction ($2-a-Day)</th>
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<tr>
<td>AJK</td>
<td>2.5% (87)</td>
<td>44.3% (1,537)</td>
<td>23.2% (806)</td>
<td>6.0% (210)</td>
<td>51.0% (1,790)</td>
<td>69.1% (2,398)</td>
<td>63.1% (2,192)</td>
</tr>
<tr>
<td>NWFP</td>
<td>9.9% (1,980)</td>
<td>12.6% (2,519)</td>
<td>11.9% (2,376)</td>
<td>10.6% (2,128)</td>
<td>76.2% (15,248)</td>
<td>76.8% (15,365)</td>
<td>76.6% (15,321)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>13.9% (21,050)</td>
<td>15.2% (23,038)</td>
<td>14.6% (22,165)</td>
<td>14.1% (21,321)</td>
<td>69.7% (105,495)</td>
<td>70.2% (106,220)</td>
<td>70.0% (105,969)</td>
</tr>
</tbody>
</table>

Note: Poverty estimates for Pakistan do not include FATA region.  
Source: ADB staff estimates based on HIES 2001/02.
What has been the earthquake’s impact on poverty? It is too early to make a rigorous assessment. However, it is possible to examine various scenarios based on information on the number of people affected by the earthquake applied to available household expenditure survey data. As noted earlier, about 54,000 people have been estimated to have been killed by the earthquake, around three fourths of whom were residing in AJK and the rest mostly in NWFP. Around 2 million people have been rendered homeless. Assuming that these 2 million are distributed in the same ¾ – ¼ ratio across AJK and NWFP, respectively, around 43% and 3% of all households in AJK and NWFP may have been affected by homelessness given that the average household size in Pakistan is around seven.

Assuming that homelessness has affected poor and nonpoor households in equal proportions (for example, 43% of poor households and 43% of nonpoor households were made homeless by the earthquake in AJK), one way to estimate the poverty impact of the earthquake is to focus on the circumstances that these households face. In a “worst case” scenario, each of the affected households is assumed to be driven into extreme or $1-a-day poverty (had they not already been extremely poor). Column 2 of Table 2 describes the post-earthquake incidence and magnitude of $1-a-day poverty in this worst-case scenario.

As the numbers indicate, in this scenario poverty rates would increase significantly (from under 3% to around 44%) in AJK and increase from 10% to almost 13% in NWFP. In terms of numbers of poor, this increase in poverty incidence translates into just under 2 million more poor in these two regions (slightly less than the 2 million people pushed into poverty given that a small fraction of the affected were already living in extreme poverty). At a nationwide level, almost 2 million more poor translates into an increase in Pakistan’s $1-a-day poverty rate from 13.9% to 15.2% in this worst-case scenario.

For a variety of reasons, the worst-case scenario described above may not be realistic. These are areas where remittances to households do play a significant role (e.g., in NWFP almost 10% of households received remittances from abroad, and the number in AJK being closer to 20%). Military and public administrative employment is also likely to be significant. These factors may help cushion some of the poverty impact. For this reason, we consider alternate, less extreme scenarios regarding the impact of the earthquake on households: one in which there is a 50% decline in household per capita consumption expenditure, a widely used proxy for household welfare, and another with a lesser 25% decline. The idea here is to get a preliminary sense
of the magnitude of the potential poverty impact if these scenarios were to be realized. These numbers will undoubtedly need to be updated as new information comes in.

In these less extreme scenarios, it is instructive to ask what happens to both $1-a-day as well as $2-a-day poverty. The answers can be seen in columns 3 and 4 of Table 2 for $1-a-day poverty and columns 6 and 7 for $2-a-day poverty. Focusing first on the scenario where household consumption expenditures of affected households are reduced by 50%, we find that the ranks of the $1-a-day poor increase by around 1.1 million (as opposed to almost 2 million more poor in the worst-case scenario considered above) while the number of $2-a-day poor increases by around 725,000 more. The smaller increase in $2-a-day poverty is due to the fact that many of the affected households were bunched up between the $1-a-day and $2-a-day poverty lines and therefore would already have qualified as $2-a-day poor prior to the earthquake.

Columns 4 and 7 of Table 2 on the other hand report poverty estimates when consumption expenditures of affected households decline by 25% instead of 50 percent. The increases in poverty as a result of the earthquake are, of course, lower in this scenario (the $1-a-day poverty rate for Pakistan as a whole is 14.1% in this scenario as opposed to 14.6% if expenditures declined by 50%, for example). What is interesting to note, however, is that the increase in $1-a-day poverty in AJK is much smaller in this case. As can be seen by comparing the poverty estimates across column 1 and column 4, poverty rates increase from 2.5% to only 6% as opposed to about 23% if expenditures had declined by 50% instead. We do not see such large sensitivity of poverty estimates in any of the other cases, including the case of $2-a-day dollar poverty for AJK. The reason for this may be found in the pattern of consumption expenditures across households. As may be seen from Figure 4, which presents the distribution of per capita consumption expenditures prior to the earthquake in both affected regions, there is a large bunching of households just to the right of the $1-a-day poverty line in NWFP but not in AJK.

As a result, small shocks to consumption expenditures in AJK would not translate into large increases in extreme poverty. Since the earthquake may well represent a large shock to consumption, converting this into a smaller shock through emergency assistance should be very effective in preventing a large rise in extreme poverty, in the short run, as a result of the earthquake. As for the medium term and longer, sustaining recovery at the household level will require
restoring livelihoods. In the next section, we focus on one issue that we argue will be important for economic recovery efforts, especially given the importance of household production activities in the region: the issue of risk, and mitigating it.

Figure 4. Distribution of Household per Capita Expenditure
Mitigating Risk for Poverty Reduction

Natural disasters such as earthquakes, tsunamis, and typhoons remind us that certain kinds of shocks strike entire populations without regard to economic status. Some may even argue that the well-off segments of the populace are more adversely affected—at least in economic terms—by such events as they have more to lose in terms of assets and other possessions. However, in recovering from such adverse situations, there are often clear distinctions by economic status: the poor have a significant disadvantage in this regard as they often lack access to credit and social protection mechanisms (e.g., property or weather insurance) to enable a “smoothing” of consumption in light of exogenous variability to their income.

In this regard, this policy brief argues that one key aspect of poverty that needs to be highlighted is that of vulnerability. The conceptualization of poverty as low income or consumption is incomplete: the poor are also more exposed to and less able to cope with risk and negative shocks. More specifically, using this earthquake in Pakistan as a case in point, we argue that: (i) those who are currently nonpoor but are at risk of being pushed into poverty by adverse events merit policy attention in terms of provision of social protection; (ii) effective social protection often requires careful targeting; and (iii) the absence of adequate social protection hinders movements out of poverty. It is important to note that to understand the linkages between risk and poverty requires micro-level data that are often not available. More information on the characteristics and decision-making environments of the poor, as well as about those who are at risk of becoming poor and those who have successfully moved out of poverty, is needed to capture some of the key binding constraints hindering poverty reduction.

It is not always obvious what the effect exposure to risks can have even on the choice of income-generating activities. This phenomenon is often referred to as “income smoothing.” This pertains to empirical evidence that suggests that households facing risky environments have a tendency to partake in more conservative economic activities, or those that are also inherently associated with lower levels of return (Morduch 1995). These risks are not only those related to natural disasters. When not adequately protected from labor market shocks (e.g., unemployment) or weather shocks, households may be less likely to invest resources in education or fertilizer use as the associated losses from such investments will be high if the adverse shock is realized. Other undesirable outcomes include, for instance, high fertility rates among the poor, which many argue are often a
means of mitigating income-generation risk. Evidence suggests that high exposure to health shocks—when not buffered by insurance—lead households to hold assets in more liquid (and low-yielding) forms as a coping mechanism in the event that an adverse health shock is realized.

The policy implications of this needs reiterating: the arguments above underscore the centrality of well-targeted social protection policy mechanisms as potent poverty reduction tools. These are justifiable (at least for the sake of argument in this policy brief) not on grounds of equity, justice, human rights, or other such considerations, but on the basis of maximizing the effectiveness of individual choices and decision making. Effective social protection can help provide a conducive environment within which individuals are better able to “pull themselves up from the bootstraps”, proverbially speaking.

Conclusions

Large-scale disasters such as this recent earthquake in Pakistan remind us of human frailties and vulnerability to nature. The government has announced a package of Rs 100,000 (US$1,671) to surviving next of kin. This may help mitigate some of the immediate economic effects of the earthquake. Traditional economic impact analyses in such situations often tally the loss of value of physical infrastructure and foregone income. Reconstructive efforts tend to focus solely on rebuilding lost infrastructure and facilities. In this regard, earthquake-proofing of new construction must be a consideration: some have argued that the additional costs of such safeguards do not add more than 2–4% of total building costs (The Economist October 2005).

In this brief, we argue that additional risk-mitigating policies can play a central role in reducing the economic burden of recovering from such shocks. Internalizing the concept of vulnerability at the microeconomic level and reducing risk through initiatives in social protection will be a precondition for rehabilitation and reconstruction to enable affected areas to reach pre-earthquake levels, or even to surpass them.

Social protection can cushion economic losses from a host of adverse shocks ranging from earthquakes, to droughts, to unemployment. However, we argue for social protection not on humanitarian grounds (which may be warranted) but on grounds of economic efficiency. There are compelling arguments for recognizing the importance of risk and vulnerability for poverty. The poor are not simply those with lower income and consumption but, more often
than not, also face a more constrained and difficult environment within which choices are made (Banerjee 2004). In addition, those who are at risk of becoming poor are an important group meriting attention in any policy analyses.

References

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