

Preliminary Environmental Assessment of the Earthquake in Pakistan

IUCN Field Mission Report



October 16-18, 2005

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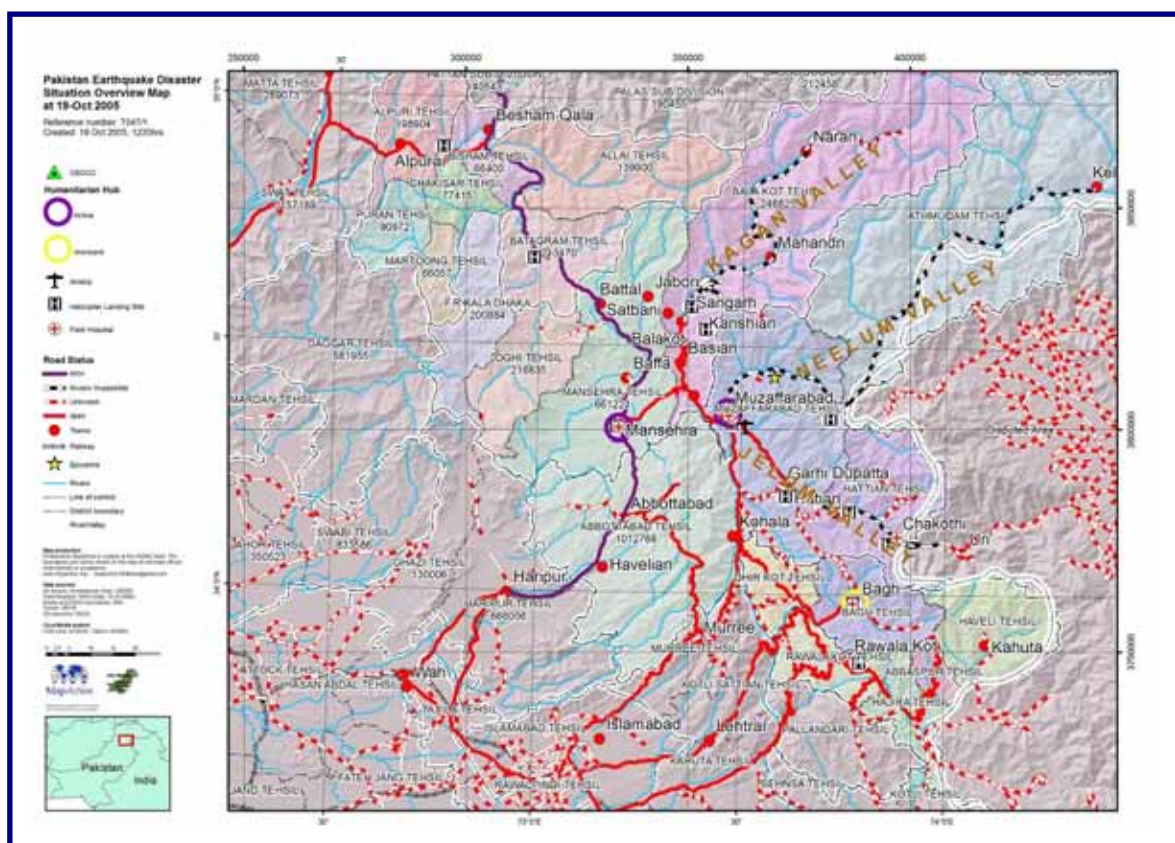
1. Introduction

On the morning of October 8, 2005, an earthquake of magnitude 7.6 on the Richter scale struck South Asia, causing inconceivable destruction, mainly in parts of NWFP in Pakistan, Azad Jammu and Kashmir (AJK) and parts of Indian administered Kashmir. According to Pakistan Meteorological Department and Geological Survey of Pakistan, in the two weeks following the earthquake, more than 900 after shocks have been felt. According to the latest estimates, an area of more than 30,000 square kilometres has been devastated – rendering nearly 3.5 million people completely or partially homeless, over 58,000 people have lost their lives and more than 77,000 have been severely injured.



Furthermore, road access through the mountainous regions, leading to the main cities and valleys, has been interrupted by landslides. Though the army has restored the major road network, there are countless settlements far beyond the reach of these roads. Currently the situation of the affected people is desperate and the expected winter rain in the lower elevations, along with cold temperatures and snow in the mountains, will severely aggravate it.

From October 16 to 18, an IUCN mission, comprising Mahmood Akhtar Cheema, Ahmad Saeed and Karl Schuler, visited some of the most affected areas, to get a better understanding of the catastrophe and its potential impacts on the affected people and the environment. This team visited Abbottabad, Battagram, Oghi, Balakot, Galiyat (Dalola) in NWFP and Muzaffarabad in AJK.



From: <http://disasters.jrc.it/PakistanEarthquake/>, European Commission, Joint Research Centre

The first priority of the government and other agencies is to provide access, food and shelter, and thereafter, livelihoods, to the millions of affected people. Most of them were dependant on natural resources and /or were small traders. It would be a challenge to rehabilitate them with options of income generation, which are sustainable and environmentally feasible.

The major concern of IUCN is to minimize the risks of further environmental hazards and damages in the aftermath of the earthquake, which in turn, can have short and long term impacts on the safety and well-being of the people. IUCN wants to provide assistance in restoration of the mountain ecosystems and livelihoods heavily affected by the earthquake and in integrating environmental policies and provisions in the reconstruction and rehabilitation processes. IUCN would also like to assist in putting into place a comprehensive and effective disaster risk management strategy.

This report is based on personal observations and discussions with local people, government officials and relief organizations. This is a preliminary scoping report, which sets the stage for a more comprehensive environmental assessment to be undertaken in the next few weeks.

2. General Observations

The team was totally overwhelmed by the extent of the catastrophe. It was not the time to speak about environmental issues with the affected people. The discussions were mainly on the earthquake and its impacts on their families, their losses and their immediate future.

The destroyed sites have mostly been abandoned and only a few people were noticed looking for their belongings or dead bodies.



Relief efforts were underway wherever the team visited.

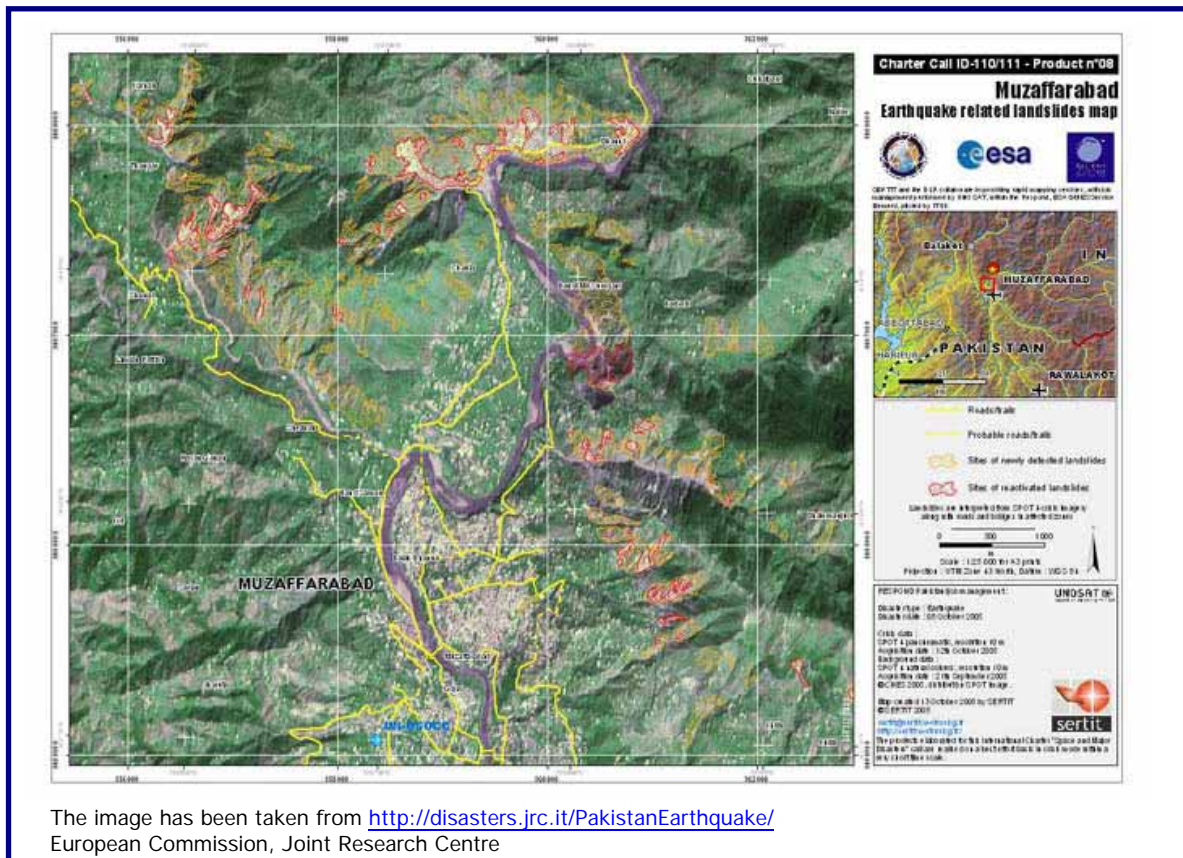
However, it was noticed that in such a situation, coordination was a huge challenge. Clothes aid was spread everywhere, whereas other vital items, such as tents, were in short supply. The men were seen along the roadsides and in the relief camps getting their portion of aid supply, while women and children were mostly seen in very rudimentary shelters in open spaces. Reportedly, poor people, communities in remote areas, and single women faced difficulty in getting access to aid.

Most of the houses that are still standing are also not liveable, due to extensive structural damages (some of the buildings that the team visited were destroyed two days later by aftershocks). Poor quality construction has undoubtedly contributed to the excessive destruction and losses. All kinds of buildings, using different types of construction material and techniques – Reinforced Concrete Cement (RCC), traditional mud-stone-wood structures, light constructions with corrugated tin sheets, brick, single and multiple-storey buildings, old and new buildings, houses of rich and poor etc.- have collapsed. However, in some places the traditional structures endured the earthquake shocks better than the RCC structures.

3. Earthquake - Environmental Management Nexus

There is at present no reliable scientific evidence for environmental (mis)-management as a cause for the earthquake.

However, the extent and scope of the damages and losses of human lives are undeniably, to a certain extent, man-made and have (among others) links with environmental management. For example, there is strong evidence that slopes with a good forest cover have provided better protection for buildings and roads from the landslides caused by the earthquake than denuded slopes.



4. Potential Environmental Risks

There is a need to assess the damages caused by the earthquake on the environment, such as the impact on agriculture and pasture land; trees and forests; wetlands, springs and irrigation systems; water quality; ecosystems and biodiversity; protected areas, cultural heritage etc. These damages need to be valued in economic terms. Additional environmental damages will occur in the aftermath of the earthquake. Some of them may only be visible after a year or later.

The most important need is to look for and identify environmental risks, which could cause further damages and losses, if not taken care of adequately. The most prominent among them are as follows:

4.1 Landslides, Mudslides and Flashfloods

- There is risk of further massive land- and mudslides caused by aftershocks and rains, as the soil has been jolted and has lost its stability. The consequent risk is of river blockages caused by landslides and the possibility of flash floods, if these naturally created dams break. This would cause a serious threat to temporary shelters and campsites on slopes, foothills and those close to the riverbeds.
- Landslides have also introduced massive sedimentation in rivers such as Kunhar, Jehlum and Neelum, causing a visible increase in turbidity. This increase in turbidity may negatively affect fisheries especially in the breeding season. But more



importantly, these *seismo-sediments* may pose a potential threat to the safety and capacity of downstream reservoirs, Mangla, in particular.

4.2 Water Contamination

- Due to a general lack of sanitation facilities and leaching of hazardous material / substances into water bodies from destroyed warehouses, maintenance facilities, etc., there is a great danger of runoff from destroyed towns and villages and temporary settlements contaminating water bodies in the affected areas.

4.3 Debris and Waste

- There will be great difficulties in properly dealing with the clearance and safe disposal of the debris of devastated buildings, in the villages and cities. The amount of debris generated from the devastated cities / villages is huge and disposing it properly is going to be a massive challenge during reconstruction.
- Influx of aid and ongoing relief efforts may also have an impact on the environment in the area. A lot of waste will be generated, without having any proper mechanism to dispose it. This will eventually result in water and land contamination.
- Medical waste generated during relief operations is also going to be in significant quantities and its disposal will be a major challenge for the Government and relief agencies.
- Hazardous waste generated due to destruction of chemical warehouses / shops, hospitals, pesticide storage areas, etc. is an existing and potential environmental and health threat. Identification of such locations and their proper handling may be needed.

4.4 Health Risks

- There is a strong risk of disease and epidemic due to contaminated drinking water and lack of sanitation, especially in urban areas and temporary settlements.

4.5 Ecosystem Depletion

- There is a risk of deforestation for energy needs, temporary shelters and reconstruction, with possible consequences like landslides, erosion and floods. Other environmental risks, like stone mining for reconstruction, might cause further damage to the ecosystem.
- There may be further deforestation when new cities, temporary settlements or other needs emerge. For instance, suggestions are being made to shift Muzaffarabad to a nearby forested valley. This would have a severe impact on the forest in the valley. Other new settlements may also emerge by clearing forested areas, since clearing of debris in existing settlements may be more difficult and time consuming.
- There are three existing and one potential protected areas affected by the earthquake. The damages caused by the earthquake on the ecosystems and wildlife of these parks need to be assessed and there is a need to protect them against the additional pressures caused by relief and rehabilitation operations.



4.6 Destruction of Cultural Heritage

- Different historical sites, among them two historical forts in Muzaffarabad, have been severely damaged in the recent earthquake, and if proper attention is not given to their repair, important cultural heritage sites may be lost forever.

4.7 Affected Livelihoods Options

- Damage to the irrigation system may negatively affect the agriculture production in the next season. Moreover, death and out-migration of animals may affect the availability of farm manure in agriculture. Similarly, decrease in workforce, because of casualties and migration may also affect agricultural production in the area.
- Reduction in cultivable area, due to location of temporary and permanent settlements on agricultural land, may also result in loss of production and may also negatively impact livelihoods in the area.
- Out-migration to urban areas down country has already started happening, and it may increase on the arrival of severe winter. This may result in depletion of workforce and also increase pressure on adjacent urban centres such as Abbottabad.
- Tourism was one of the major sources of economic activity in the earthquake affected areas. Many tourists from within and outside Pakistan visit these areas, especially during summers. The earthquake may adversely affect tourism in the area and it may take some time before tourism is revived.

5. Course of Action

While planning relief and rehabilitation measures, it is necessary to differentiate between:

- Short term (urgent, vital, life-saving)
- Medium term (temporary solutions, over the winter)
- Medium to long term (reconstruction/rehabilitation, measures for human well-being, environmental considerations).

5.1. Short term

- Assessment of immediate environmental damages and risks, such as landslides, flashfloods, water contamination, debris disposal, identification of hazardous material sites etc. and intervene as soon as possible (army, government authorities).
- Compilation and sharing of information about the damages and losses and different ongoing and planned relief operations: Who is working? Where? What is their focus? (www.pakrise.com tries to coordinate this information).
- Coordination of different environmental interventions, to avoid overlaps and ensure more coherent and meaningful response to environmental issues, must be facilitated. Organizations such as the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), the World Conservation Union (IUCN), the Worldwide Fund for Nature (WWF), the World Bank (WB), the Asian Development Bank (ADB), Department For International Development (DFID) and CARE should find a way to coordinate their efforts more effectively.
- Rapid Environmental Assessment of the environmental damages caused by the earthquake and for short and medium term relief period (from now up to three months; maximum six months); to avoid further damages and losses related to the disaster and the relief operations and rehabilitation.
- Development of relief guidelines, to assist relief agencies. Undertake relief operations with minimal damage to the environment (to be developed; guidance from existing United Nations High Commission for Refugees (UNHCR) and other agencies guidelines).
- Proper management of temporary camps, admittedly not easy, but essential in minimizing environmental and health risks to the affected population (location, energy and sanitation).



UNHCR and other relief agencies have experience in effectively managing temporary camps and rehabilitating of sites in later stages.

5.2. Medium term

- Develop rehabilitation/reconstruction guidelines: Assist the Government and other international and local organizations in undertaking rehabilitation and reconstruction trying to minimize damage to the environment. These guidelines will be in continuation of the relief guidelines developed earlier.
- Develop strategy and plans for reconstruction/rehabilitation: This is an essential part of the rehabilitation and reconstruction phase and will be undertaken by the newly created Earthquake Rehabilitation and Reconstruction Authority (ERRA). All efforts should be made to get environmental aspects incorporated in the Strategy and subsequent plans.
- Review and adopt Disaster Management Strategy: The disaster management strategies and plans of the Government of Pakistan need to be reviewed and revised, based on the lessons learnt from the recent tsunami experiences. Once reviewed, it should be adopted and put into implementation. The review should also identify areas where environmental aspects can be incorporated in the Strategy.
- Review policy / legislation: Undertake the review of the relevant laws and policies to identify those which may not support an appropriate disaster response. In addition, building codes and disaster management systems should be reviewed, to prepare for any future disasters. Based on observations, recommend better construction practices and develop and implement building codes (environment-friendly, energy and timber saving).
- Develop proper reconstruction schemes (individual or collective): The new settlements or housing schemes planned for the devastated areas are to be safe, energy efficient, culturally harmonious and environment friendly. In this context, all care should be taken to avoid ecosystem degradation. The restoration should be planned as a whole in order to make the best present and future use of available resources through a comprehensive and integrated approach to development in the affected areas.
- Restoration of cultural heritage sites: Some of the cultural heritage sites were destroyed in the recent earthquake, like two forts in Muzaffarabad. These cultural heritage sites which have been destroyed are national assets and should be restored. Similarly some historical religious sites, such as tombs and mosques, have suffered damage and need to be restored.
- Adoption of optimal Land Use Policy: Surveys and assessments need to be carried out to come up with a rational land use policy. To the extent possible, actions contrary to the inherent capability of land should be avoided.
- Assess damages to the affected protected areas and put into place a recovery plan: In addition, management of land outside protected areas, particularly Machiara National Park, should be carried out in such a way that adequate populations of indigenous wild plants and animals can survive in the protected areas and parks..



6. Recommended IUCN Interventions

The task ahead is immense. The area is vast and diverse, and the access is difficult. Many organizations are already active in the field. Therefore IUCN needs to focus (thematically and geographically) on providing efficient and meaningful contribution.

The experience gained by IUCN in its tsunami rehabilitation programmes will be of great help for avoiding mistakes and bringing input for appropriate solutions to the upcoming challenges.

Recommendations:

- Rapid Environmental Assessment (REA): A detailed REA is to be undertaken, based on the findings of the scoping mission. The detailed REA will further build on the findings of other ongoing assessments and will come up with concrete suggestions. A team of experts from the IUCN Asia Region and Pakistan will carry out this assessment.
- Disseminate Findings of the REA: The findings of the REA, especially the ones related to imminent risks, which can be prevented, are to be disseminated to the relevant government agencies, multilateral organizations, NGOs, disaster relief and rehabilitation organizations and the media.
- Develop Relief Environmental Guidelines: There is an immediate need to develop guidelines, which can assist relief agencies in undertaking relief operations with minimal environmental damage. The guidelines will be developed realizing that relief agencies work in extremely difficult circumstances and their immediate task is to provide relief to affected people, and may not be in a position to give environment a priority. The guidelines will be developed taking guidance from other existing guidelines. The guidelines will be shared with the Earthquake Rehabilitation and Reconstruction Authority (ERRA), other government agencies involved in relief operations, local, bilateral and multilateral relief organizations and relevant civil society organizations. It will be a dynamic document and will need to be revised, based on the input received.
- Environmental Assessment of Temporary Shelters: A number of temporary shelters are being set up at numerous places in the earthquake affected areas. The previous experience with Afghan camps shows that temporary camps may turn into permanent settlements. The environmental impacts of these camps (both temporary and permanent) are quite significant, especially on the nearby forests and water resources. It is therefore necessary that an investigation, which may not be very detailed, is undertaken of all the large camps setup for earthquake affectees. IUCN can assist the relief agencies in undertaking quick assessments. However, it should be kept in mind that most of the camps have already been set up and are functioning. In such a case, a quick environmental audit of such camps can be undertaken with some practical suggestions.
- Develop Rehabilitation and Reconstruction Environmental Guidelines: These guidelines will focus on the rehabilitation and reconstruction phase and will be developed in collaboration with the ERRA and other relief and civil society organizations. The guidelines will be further refined based on the feedback received from other organizations.
- Disaster/Risk Management Strategy: IUCN should work with the relevant Government of Pakistan department / agency to review and revise the disaster management strategies and action plans, in light of the current earthquake related experiences. It should also work with the Government in the approval process, and later, into implementation. It could also work in the incorporation of disaster management and prevention strategies into mountain policies, for example, in the framework of implementation of the Northern Areas Strategy for Sustainable Development (NASSD) and district level Integrated Development Visions.
- Address women's needs: Right after the earthquake, IUCN started to document the impact of the earthquake on women and mobilized the relief organizations in NWFP to discuss ways to address the needs of women in their relief operations. A detailed study is planned to be undertaken, to study the impacts of the earthquake on women in the area. This should be further incorporated into disaster management action plans and policies.

- Area-based Interventions: In addition to working at the policy level and improving disaster management systems in the country, IUCN should plan to work in focused geographical areas, in partnership with organizations involved in relief and reconstruction (Sungi, Local Government, CARE, Government of AJK, others) to be able to make a definite and long lasting impact on the area. Clear understanding and definition of roles with partners and other organizations working in the area, in line with IUCN mission, both environmental and social, is crucial. IUCN should play a role in the reconstruction and rehabilitation of one or two watershed areas. The suggested thematic focus of this work should be environment, natural resources, water, forests, pasture land, agriculture, irrigation, ecosystems, energy, sanitation, and appropriate environment-friendly and safe construction techniques. Other aspects would be equity, livelihoods, gender, economy; access rights to natural resources and policies etc. The major tasks would be:
 - Help (advise) the overall coordination and implementation of interventions in the watershed.
 - Help set up a model rehabilitation village. Implementing and training the people working in the reconstruction is important.
 - Provide input (based on field realities) for IUCN's guidelines and policy work.

The World Conservation Union (IUCN)

Created in 1948, IUCN-The World Conservation Union brings together 82 States, 112 government agencies, 850 plus NGOs, and some 10,000 scientists and experts from 181 countries in a unique worldwide partnership. IUCN's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

IUCN is the world's largest environmental knowledge network and has helped over 75 countries to prepare and implement national conservation and biodiversity strategies. IUCN is a multi-cultural, multilingual organization with some 1000 staff located in 62 countries. Its headquarters are in Gland, Switzerland.

IUCN Pakistan has five programme offices in cities from the north to the south, multiple field offices and a large portfolio of projects. It is one of the 9 Country Offices of IUCN's Asia Programme, covering 23 countries with a workforce of nearly 500.

<http://www.iucn.org>

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