



Ministry of
Environment

**UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)
UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)
MINISTRY OF ENVIRONMENT (MoE)**

Project title:	Environmental Recovery Program for the Earthquake Affected Areas
Duration:	36 months
Proposed budget:	USD 12.8 million
Location:	Azad Jammu & Kashmir (AJK) and North West Frontier Province (NWFP)
Beneficiaries:	Earthquake affected people and the natural environment of AJK and NWFP
Project execution:	UNDP in close collaboration with ERRA
Implementing partners:	UNEP, PERRA, SERRA, DRUs, NESPAK, GSP, Forest and Agriculture Departments, District Governments, Municipalities, NGO, CBOs, Private Contractors

Executive Summary:

This Program is designed to work through a partnership that has been developed in Pakistan between the Ministry of Environment, UNDP, UNEP, the Earthquake Rehabilitation and Reconstruction Authority (ERRA), other agencies, local and international NGOs. The Program's development has been guided by needs identified in the joint UNEP/OCHA *South Asia Earthquake Disaster Preliminary Environmental Assessment* completed in early December 2005. The Assessment also informed the drafting of the United Nations System's *Pakistan 2005 Earthquake Early Recovery Framework*.

The Program focuses on active intervention in the two key areas of:

- **waste / debris management** (providing training in reuse and recycling, debris management and facilitating private sector investment in debris recycling); and
- **slope stabilization, livelihoods and natural resource management** (substituting alternatives to meet energy demand, vulnerability assessment and mapping, slope stabilization measures, capacity building and integrated forestry and livelihood).

The Program will recruit local expertise to build capacity within existing institutions; deliver training workshops to disseminate best practices; use quick disbursing grants and equipment to facilitate alternative energy use; implement engineering and bio-engineering works to stabilize landslides/slopes, and provide national and international expertise to strengthen national capacity in disaster risk reduction to support an environmentally sustainable and equitable post earthquake recovery.

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Country: Islamic Republic of Pakistan

UNDAF Outcome: Effective disaster response and mitigation systems for risk reduction and rehabilitation of areas and communities affected by prolonged emergencies.

Expected Outcome Indicator: Significant improvements in response time to disasters and crises.

Outcome Indicators:

- 1 Strengthen national capacity in disaster risk reduction to support an environmentally sustainable and equitable post earthquake recovery.
- 2 Earthquake rehabilitation and reconstruction National Plan of Action implemented in a timely, equitable and sustainable fashion through the established government entities.

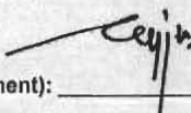
Output Indicators:



- Strengthen institutional capacity for environmental impact assessment and monitoring
- Environment friendly management of waste and debris
- Landslide risk reduction for protecting livelihoods and natural resource

Implementing Partner: UNDP Direct Execution

Other Partners: ERRA, MoE, EAD, SERRA (AJK), PERRA (NWFP), UNEP

Programme Period: 36 months Project Title: Environmental Recovery Programme for the Earthquake Affected Areas Project Duration: 36 months	Total budget: US\$ 12.8 m Allocated resources: US\$ 1.0 m UNDP: US\$ 1.0 m Resource gap: US\$ 11.8 m
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Agreed by (Government):  **AMIR TARIQ ZAMAN**
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Islamabad 4.5.07

Agreed by (UNDP):   **MIKIKO TANAKA**
Deputy Country Director
04 MAY 2007

Reviewed and agreed by ERRA (19 March, 2007)

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Reviewed and agreed by ERRA (19 March, 2007)

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Part 1. Situational Analysis

The earthquake and its impact

The immediate impact of the 8 October 2005 Pakistan earthquake included deaths exceeding 73,000 people, at least 100,000 injured, more than 3 million people homeless and extensive damage to social and physical infrastructure. The earthquake measured 7.6 on the Richter scale with the epicenter 19 km northeast of Muzaffarabad. In excess of 1800 after shocks have been recorded in the months since 8 October, some as high as 6.4 on the Richter scale, threatening previously damaged unstable structures and together with rain and snow melt, increase the risk of further Landslides and loss of life.

The impact of the earthquake extends over some 30,000 sq km of the upper mountain catchments of the Indus River and its major tributaries, including the Neelum, Jhelum and Kunhar Rivers within Azad Jammu & Kashmir (AJK) and the North West Frontier Province (NWFP). Harsh winter weather conditions experienced in this mountainous area have placed the surviving population under additional stress with immediate relief needs of food, shelter, heating and sanitation being supported by a large number of national and international agencies and NGOs.

In addition to the broader humanitarian impact, the earthquake has had a severe impact on the region's institutional capacity through loss of life and physical infrastructure. This is particularly evident in centers such as Muzaffarabad, the seat of AJK Government, but also within local administrations and more decentralised remote offices such as the Forest Department.

The earthquake's epicenter and impacted area is within the mountainous upper catchments of the Indus River. The impacts in this area are dramatic and often highly visible. Broader impacts are less evident but extend well beyond the immediate area. The Indus is Pakistan's primary source of water feeding the largest contiguous irrigation system in the world. It provides agricultural and fishing livelihoods and hydroelectricity power to millions of people. Silt from Landslides and debris is impacting on water quality and is predicted to significantly impact / reduce the recent additional capacity constructed at the Mangla Dam on the Jhelum River downstream of Muzaffarabad negating in part, an enormous capital investment.

Damage caused by the earthquake to the environment

A summary of the immediate to medium term environmental impacts and needs is as follows:

Institutional capacity

The human cost of the earthquake is the key environmental impact. Loss of institutional capacity, death and damage to infrastructure in all sectors, has greatly reduced local capability to manage the impacts of the earthquake and facilitate recovery.

Reconstruction will place a large additional burden on capacity that is already under stress. The President of Pakistan has publicly stated that environmental impact will be taken into account as part of reconstruction. Additional capacity and expertise is urgently required in a number of disciplines including waste management, forestry and natural resource management, water quality monitoring and environmental assessment of reconstruction proposals.

Waste Management

The earthquake has generated large volumes of debris some of which is hazardous to local populations and/or those engaged in clean up operations. Temporary camps and medical centers also present management challenges. A summary of the major waste streams is as follows:

Debris

An enormous as yet un-quantified volume of debris from collapsed buildings and other infrastructure has been generated by the earthquake. In heavily impacted areas such as Balakot and Muzaffarabad practically all built assets have been destroyed or damaged beyond safe reoccupation. Clearance of debris is a priority as together with Landslide debris it is impacting on livelihoods by delaying reconstruction of buildings and transportation networks in areas where flat or stable land is scarce.

Inappropriate disposal of debris will fail to capitalise on livelihood and recycling opportunities and potentially threaten further impacts on public health, rivers and other natural systems. Reuse and recycling potential is evident with the value of recovered “cleaned” concrete reinforcing steel being more than 50% of the value of new reinforcing, expected to rise further and already generating work/cash for impacted populations.

Medical waste

Approximately 70% of medical facilities in the directly affected area have been destroyed or damaged greatly disrupting existing capacity to manage clinical stocks and medical waste. Appropriate training and management of these sites and temporary facilities is required to minimize risk to human health and ground water quality.

Other hazardous materials

In addition to medical waste other potentially hazardous materials include persistent organic pollutants from agro chemicals, ammonia from refrigeration (food processing plants), and hydrocarbons from sites such as petrol stations, asbestos from wall and roof sheeting and PCBs from damaged electricity transformers. None of above hazardous materials is understood to be wide spread in their distribution but may pose significant threats to human health and the broader environment at localised sites. Training is required to ensure this material is managed and disposed of appropriately.

Solid and human waste

Existing domestic and municipal sewage systems, many of which were already quite basic, have been destroyed resulting in ground water contamination and serious threats to human health. This is an immediate issue in tent camps and inhabited settlements and a major infrastructure issue in reconstruction.

Due to non-availability of dump sites waste is being dumped in the Rivers. This has a negative impact on water quality and is a serious threat to downstream human health throughout the Indus Basin.

Natural Resources, Vegetation and Land stability

Livelihoods, vegetation and land stability are intrinsically linked in the affected area. Landslides claimed many of the lives during the earthquake and correlate to areas denuded of vegetation. Landslides will continue to pose a major threat to life and infrastructure in the months and years to come as rain and snow melt increase pressure on unstable slopes. In AJK during early February 06 a Landslide claimed a further 200 homes, fortunately with no loss of life.

The affected area also contains habitat of global significance for species such as snow leopard, black bear, musk deer and threatened vegetation communities. The enormous tourism / livelihood potential of the area is well understood and relies on these natural assets.

Timber harvesting from forests is a key source of livelihood for local communities, demand for which will increase dramatically with reconstruction. Firewood is also the primary source of energy for heating and cooking in many communities. Well forested or vegetated hillsides provide stability and greatly reduce vulnerability to Landslides. Deforestation is acknowledged as a long standing issue in the impacted area. There are however, a number of successful programs to build upon which offer alternate livelihood opportunities such as community based propagation and planting, substitution of LPG and other

alternatives for cooking and heating, together with alternate construction design and materials to minimise the impact on forests.

Immediate response by UNDP, UNEP and the Ministry of Environment

At a meeting on 29 October 2005 the Ministry of Environment requested that UNEP in partnership with UNDP and the Government of Pakistan prepared a preliminary environmental assessment of the earthquake. In response and with the assistance of UNDP the “Joint Unit” of UNEP/OCHA (Office for the Coordination of Humanitarian Affairs) sent a team which completed the *South Asia Earthquake Disaster Preliminary Environmental Assessment* in early December 2005. Team consisted of international and local experts with expertise in waste management, land stability and natural resource management. The *Preliminary Environmental Assessment* identifies the early recovery environmental issues, together with immediate, medium and long term priorities for intervention.

The *Preliminary Environmental Assessment* was also used to inform the United Nations System’s *Pakistan 2005 Earthquake Early Recovery Framework* completed in November 2005. The Early Recovery Framework outlines needs, specific strategies and program interventions for all sectors including the environment. The Environmental Recovery Program and the interventions outlined below are consistent with the Recovery Framework.

In addition to the above UNDP has launched the following projects to support early recovery in the impacted area.

- 1- An emergency shelter for US \$ 9.9 million.
- 2- Rubble removal and cash for work for US \$ 5 million.
- 3- Aid coordination (DAD) US \$ 1.5 million
- 4- Support to volunteerism US \$ 5 million
- 5- Support to ERRA US \$ 4.8 million
- 6- Transitional shelter program for US \$ 11.6 million
- 7- Heating and cooking energy for US \$ 5.3 million

Of the above mentioned resources, some 13% came from UNDP (Headquarters as well as Country Office resources) and 87% from bilateral donors and Foundations, namely, Germany, Norway, New Zealand, UN Foundation, UNISDR, UNICEF, UK, Switzerland, Sweden, Turkey, Canada, Finland, and Italy).

Past experience in working in AJK and NWFP

UNDP has been providing assistance to the Government of AJK and the vulnerable groups since 1988. Some US \$ 30 million have been spent to build the capacity of the Planning & Development Department for sustainable planning, to enable the Roads Department to digitise the road maps and adopt new technologies to minimize landslides damage to roads and build farm to market link-roads, to assist the Industries Department to exploit the mineral resources of AJK and provide vocational skill training to the poor people without any cost so that they could earn their livelihoods through non-agriculture based means.

UNDP completed its Area Development Programme AJK in December 2003, which promoted the social mobilization approach to upscale the pro-poor initiatives. The project was implemented by a team fielded by UNDP in close collaboration with the concerned line departments, IFAD and UNOPS. FAO provided its technical experts on need-basis to bring in the international experience. Through this project, the capacity of Extension Services Management Academy was built to develop a corps of Social Mobilizers / activists to undertake the agricultural extension work; and Irrigation, Fisheries, Silkworm, Forest, Horticulture, Agriculture and Livestock Departments were strengthened to provide high-quality technical advice and inputs (seeds, saplings of fruit/forest plants) for improving livelihoods of the poor. All of this was coupled with social mobilization campaign. Some 2,500 Community Organisations (COs) were established in the Neelum and Jhelum Valleys (worst earthquake hit areas) and 11 Cluster Organisations were established. At the completion of this project, these COs were managing a micro-credit component

of over US \$ 1 million at their own, with 99% recovery, and more than 50% beneficiaries of this programme were women. The mid-term evaluation termed this project as one of the best Area Development Programmes of UNDP.

Likewise, UNDP is operational in NWFP through its Lachi Poverty Reduction Project being implemented by the Sarhad Rural Support Programme. The programme has the same components as mentioned above. The mid-term evaluation conducted by the external evaluators indicated that the increase in income of the poor is almost 100% because of project interventions.

UNDP is also implementing the Mountain Areas Conservancy Project (MACP) in North West Frontier Province. The project area is contiguous to the areas affected by the October 2005 earthquake. MACP promotes community led conservation of natural resources while meeting the local development needs. The project has provided valuable insight for organising mountain communities and dealing with the conservation and development issues together.

Part II. The Proposed Project

Project's Objective

The overall objective of the proposed support is to assist in waste and debris management, slope stabilization, livelihoods and natural resource management by strengthening institutional and community capacity to mitigate, rehabilitate and manage the environmental impacts of the earthquake to provide for safe, healthy, viable environment for communities.

Project Description

This project is designed to work through a partnership that has been developed in Pakistan between UNEP, UNDP, the Ministry of Environment, the Earthquake Rehabilitation and Reconstruction Authority, other agencies, local and international NGOs.

The Program focuses on the immediate to medium term impacts and needs proposing interventions that aim to protect human health, provide livelihood opportunities and facilitate long term environmental recovery. The Program has been informed by the *Preliminary Environmental Assessment*, is consistent with the United Nations System's *Early Recovery Framework* and has been developed in consultation with local and international implementing partners. It will focus on active intervention in the two key areas of:

- **waste / debris management** (providing training in reuse and recycling, debris management and facilitating private sector investment in debris recycling); and
- **slope stabilization, livelihoods and natural resource management** (substituting alternatives to meet energy demand, vulnerability assessment and mapping, landslide/slope stabilization measures, capacity building and integrated forestry and livelihood).

The Program will recruit local expertise to build capacity within existing institutions; deliver training workshops to disseminate best practices; use quick disbursing grants and equipment to facilitate alternative energy use; implement engineering and bioengineering works for landslide/slope stabilization, and provide national and international expertise to strengthen national capacity in disaster risk reduction to support an environmentally sustainable and equitable post earthquake recovery.

Delivery of the Program will have the following impacts:

Short term impacts

- Waste from earthquake debris will be cleared, reused or recycled where possible.
- Non recyclable or non reusable waste will be disposed of to appropriate safe, stable locations minimizing risk to water quality, human and ecological health.
- The impact of remaining debris on remaining vegetation and land stability will be minimized.

- Impact of destabilized slopes will be reduced.
- Livelihood opportunities will be created in waste management and planting programs to assist economic recovery.

Long term impacts

- Landslide vulnerability and hazards will be understood and assessments used to inform planning and infrastructure development.
- New homes, buildings and other infrastructure will be "built back better" in an environmentally sound manner with improved outcomes for human health.
- A high level of "community ownership" of forested land will have been achieved with long term planting and management plans in place.

Strategy

The strategy has been to review the earthquake's environmental impact and needs identified in assessments by the Ministry of Environment, UNEP, OCHA, UNDP, IUCN and others to facilitate early recovery - focusing on key areas of greatest / immediate need. The areas identified as requiring immediate intervention are as follows:

Institutional capacity building in environmental impact assessment and monitoring

In response to requests from the Pakistan's Ministry of Environment (MoE) and the Earthquake Rehabilitation and Reconstruction Authority (ERRA), UNDP is already providing technical assistance under TAMEER project to ERRA to facilitate the President of Pakistan's commitment to the environmental impact assessment of all reconstruction activity. TAMEER project is providing training, assessment tools and funding the recruitment of national staff to sit within ERRA to undertake policy and planning, the environmental impact assessment of projects, monitoring and environmental awareness raising.

Waste management

The MoE has requested specific assistance in the management and disposal of the enormous volume of waste resulting from the earthquake. The Environmental Recovery Program will provide training workshops in reuse and recycling of the debris and safe disposal of hazardous waste. A satellite imagery based quantification of the volume of the debris will be carried out. The project will procure heavy crushing equipment to expedite debris crushing and facilitate reuse of the material in reconstruction activities with the involvement of private sector.

Slope stabilisation, natural resource management and livelihoods

Slope stabilization, natural resource management / forestry and livelihoods are integrally linked and will require a range of assistance and interventions in the immediate future to limit further damage and together with capacity building and planning will facilitate long term recovery.

- i. UNDP have already made effective efforts to protect existing forests and vegetation by providing alternative fuels for cooking and heating (or efficient wood burning stoves) to many impacted communities. The Environmental Recovery Program will expand this program.
- ii. At the request of the Ministry of Environment, the Recovery Program will provide for the development of a fully integrated forest management plan together with immediate planting programs to commence implementation. The plan will facilitate reforestation and land stability in the impacted area based on community engagement and implemented by providing livelihood opportunities. The Recovery Program will provide the Ministry with hazard mapping and risk assessment of Landslide sites to assist the prioritising of action, and will also undertake stabilization measures. Furthermore, the Recovery Program will provide training to Forest Department staff (train the trainer) to disseminate basic geotechnical and seismic threat information to field officers and local communities.

The two program areas and the component of institutional capacity building under TAMEER project have inter-linkages, and will be managed so that they contribute to each other. However, in order to be able to commence the program as soon as possible, the program strategy allows the program to focus on one area alone. The strategy also ensures that a donor may decide to earmark their contribution to certain program areas/elements.

Selection of Areas

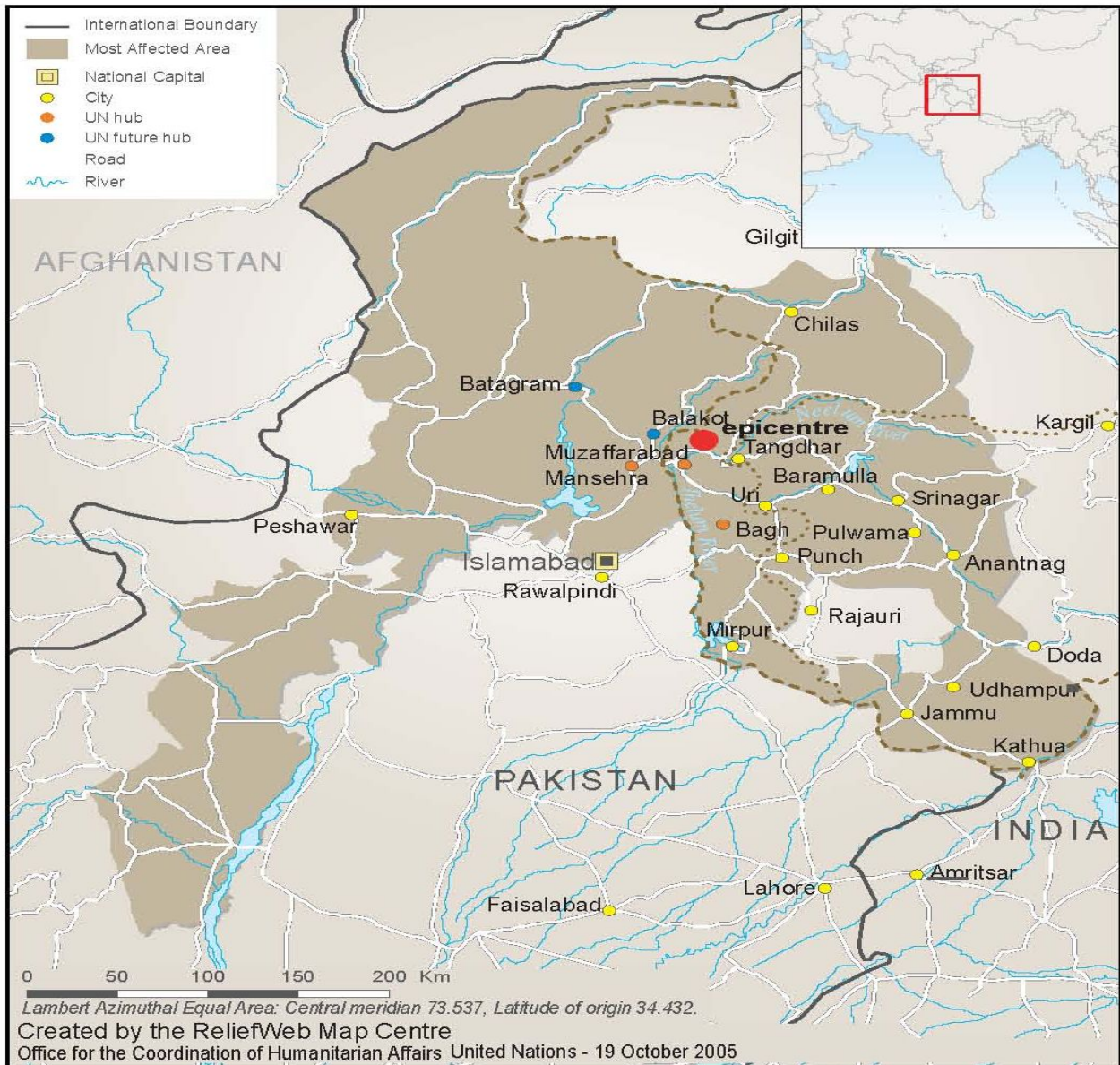
The waste management workshops will be delivered in both AJK and NWFP attracting participants / actors across the entire impacted area. The provision of debris crushing infrastructure will be focused in the districts of Muzaffarabad, Bagh and Mansehra. Smaller mobile crushers will be provided for smaller centers.

For component B1 “firewood substitution’ three districts where the UNDP initiative- provision of free LPG cylinders, cookers, heaters and refills was in operation, shall be selected. Two districts are in AJK (Bagh and Muzaffarabad), and one in NWFP (Mansehra).

For component B2 Landslide inventory shall be made over about 10,000 sq. km area out of 30,000 sq. km earthquake affected area. A number of prioritized landslides/slopes out of the inventory would be stabilized by adopting an integrated approach of engineering and bio engineering techniques.

For component B3, considering the comprehensive approach of the program it is proposed to select two independent complete sub-watersheds for integrated treatment, one each in AJK and NWFP. The earthquake affected areas fall mainly in two ecological zones viz., Blue pine zone and Chir pine zone. One sub-watershed shall be selected in Blue pine zone in Bagh district of AJK, and the second in Siran valley / Mansehra district of NWFP. The area shall be selected in consultation with the stakeholders including the Government Forest Departments, and the local / international NGOs. Criteria for selection shall be the size, damage to infrastructure and natural resources of the area, land use, ownership pattern, and the extent of public awareness and degree of social motivation.

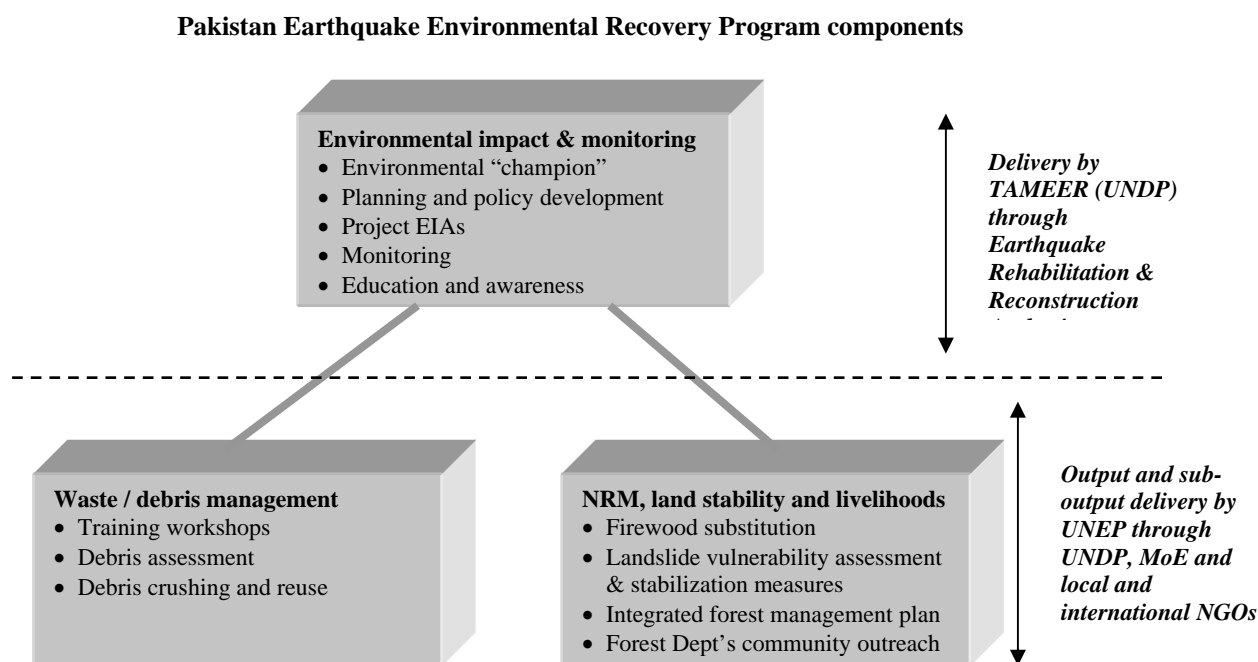
Map of the earthquake impacted area



The names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

9. Project Components

The Environmental Recovery Program consists of three key components which are summarised as follows:



Component A - Waste / debris management

The Ministry of Environment has requested assistance in expertise and capacity building in waste management, quantification of the volume of debris and provision of crushing plants to facilitate reuse of debris. This output of the Program will be delivered by three activities.

Subcomponent A1 – Capacity building waste/debris management workshop & livelihood opportunities

A waste management workshop has been developed and successfully delivered by UNEP across the Asian Tsunami impacted countries. The issues for waste managers in the earthquake impacted areas are similar and at the request of the Ministry of Environment this workshop has been revised and updated for delivery in Pakistan. The earthquake waste comprises valuable resource materials including scrap metals (copper, steel, aluminum), timber (for reconstruction and heating/cooking), demolition waste from buildings/structures (for re-use, re-working as an aggregate or infilling/protection material) and uncontaminated soil/sediment (for restoration or in-filling).

Two 1½ day workshops will be delivered – one in Mansehra NWFP and the other in Muzaffarabad AJK. The objectives of the workshop will be to:

- Present the recently developed United Nation’s Disaster Waste Management Plan (UNEWM). The Plan can be used as a framework document by the Pakistan government, UN and other multilateral and bilateral agencies, NGO’s, consultants and contractors to ensure that coordinated earthquake waste clean-up and disposal projects are implemented, which take into account all potential waste streams (be they an asset or a liability). Furthermore, the plan seeks to support revenue generation schemes, using the waste materials as a resource for the reconstruction works.
- Share and disseminate good practice in appropriate waste management schemes, including small scale recycling and reuse projects in Pakistan. The workshops will be complemented by site visits.

- Improve networking and coordination opportunities between the National Authorities and Donors, local and international NGOs, UN organisations and Implementing Agencies.

The audience will include all stakeholders (national and international) whose activities are directly (handle, store, treat or dispose) or indirectly (reconstruction programmes – housing and infrastructure) connected with disaster waste. Approximately 20 to 30 participants are expected for each workshop.



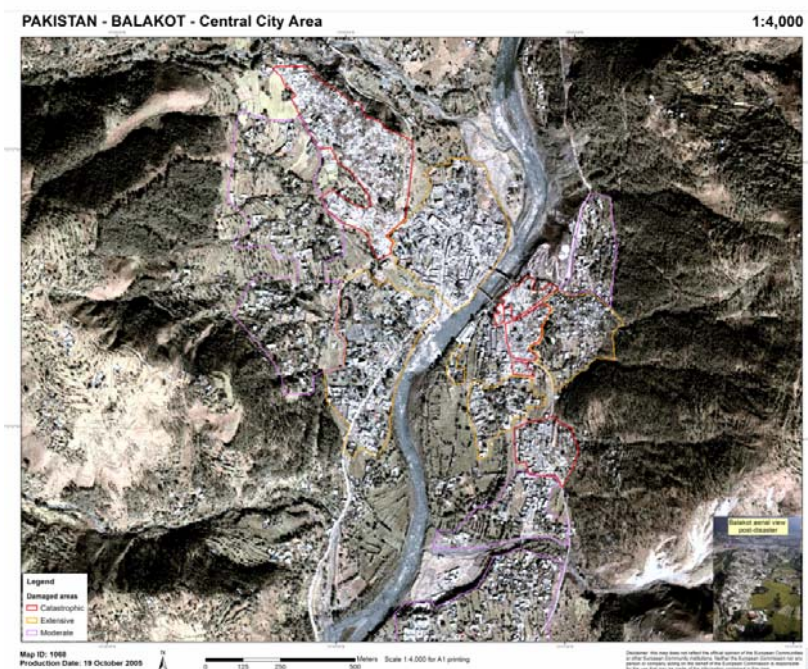
Each session will be presented by an expert in the field of emergency waste management and will include case studies. Following each presentation, the participants will be encouraged to make observations both on the subject matter and their own experience of the waste problem in Pakistan and the status of the clean-up activities.

A second round of the two workshops will be delivered six months following the initial workshops. The second round of workshops will again be facilitated by international experts and in addition to reinforcing key messages will aim to bring together the experiences of waste / debris managers from the first twelve months of operation - sharing challenges and successes across the impacted area.

Subcomponent A2 – GIS assessment and quantification of debris volume

The Ministry of Environment and ERRA have requested an estimate of the volume of debris in Muzaffarabad, Bagh in AJK and Balakot, Gari Habibullah in NWFP. The “Preliminary damage and needs assessment” report prepared by ADB and the World Bank in November 2005 estimates up to 200 Million tons of rubble. Confidence in this figure is required to plan for its reuse or disposal. The objective of the study is to quantify the volume of debris and waste following the South Asia Earthquake, as well as their spatial distribution in order to implement a large scale environmental management mechanism for the identified debris. Subcomponent A3 below will rely on a reasonable estimate of the volume of debris for reuse as construction aggregate. Selection and design of landfill sites will also rely on debris volume assessments at each impacted centre.

In defining the various elements of this proposal, UNOSAT has undertaken a background study on available reports such as the ADB and World Bank preliminary assessment report and various reports prepared by other agencies such as: UNEP, OCHA, UNHCR, UNOSAT and WFP. UNOSAT in particular has been deeply involved in supporting a wide range of UN agencies, NGOs, International Organizations and local government with satellite imagery derived maps since day one of the emergency operation. UNOSAT continues to support the operation also into the Early Recovery phase.



In order to provide solutions that match available budget and currently un-known time aspects related to field verification, UNOSAT has proposed a method where previous building analysis are freely included, but will need to be extended in terms of coverage. The methodology will analyze very high resolution satellite imagery over the three places of interest to identify individual buildings and groups of buildings. The resulting polygons, to be included in the GIS analysis, will be coupled with field information on average building heights and weight of material type.

The methodology for the assessment of building debris and waste will include:

- Volume = number houses x volume debris per house (as percentage of destroyed and partially damaged)
- Remote sensing imagery to be orthorectified and analyzed using semi-automatic detection algorithms.
- Resulting analysis from imagery are vectors.
- All vectors to be analyzed in GIS using complementary data such as access routes, population distribution, land cover, digital elevation model and more.

Verification of satellite imagery interpretation and GIS analysis will be undertaken by partners in the field, in co-ordination with the program manager. While UNOSAT will be engaged to undertake a satellite imagery based assessment of the impacted area to establish the area under debris. Local personnel will be trained to "ground truth" the satellite imagery interpretation, including estimated size (area) of individual houses detected in the imagery. For small buildings, typically less than 2.5 m by 2.5 m, the local personnel shall provide an average size (area), as these will be identified as points in the GIS and not as polygons as is the case for medium and larger buildings. For "ground truthing" of small, medium and large houses, the local personnel shall provide estimates for average building heights as well as nature of debris.

Subcomponent A3 – Provision of crushing infrastructure and livelihood opportunities

The Ministry for Environment has requested that plant and equipment be provided to enable the crushing and reuse of debris. Observations in the impacted areas suggest that the other major elements of this debris consist of steel reinforcing, timber and corrugated iron roofing, all of which already have a value and are being extracted for sale or reuse on site. Reuse options for the crushed material include aggregate for brick manufacture and road base – both of which will be in high demand as reconstruction begins. Alternatives to crushing include dumping in rivers or gullies threatening a major increase in the silt load of water courses and significant downstream impacts or creating large uncompacted unstable dump sites.

Organised rubble removal has been undertaken by a number of projects including by the International Organization for Migration (IOM), the military and other relief and reconstruction agencies. UNDP had a \$5 million project of rubble recycling and clearance specifically for health care centers and schools in Batagram, Bagh and Gari Habibullah. A systematic approach is required to facilitate rubble reuse in reconstruction projects in all impacted urban areas.

The objective of this subcomponent is to develop public private partnerships in debris processing and reuse. The Program will provide seed funding for investment in crushing equipment in order to develop financially viable operations resulting in reuse of the debris and minimizing the volume of material that is dumped. Success will rely on the establishment of demand (a market) for the crushed material and viable business and logistical models to efficiently transport and crush the material. Potential revenue streams to attract local business partners include site clearance fees and sale of aggregate for reconstruction activities. Potential local business partners include heavy construction and quarrying operators who are likely to have the interest and experience necessary to invest and manage such an operation.

Donors may wish to sponsor the importation of specialist technology, equipment and training. Locally manufactured crushers are however, available and in common use in quarrying and brick production operations throughout the area. Local equipment may be the cheapest option both in terms of the initial capital outlay and in maintenance costs. However in case immediate delivery is required international sourcing for the crushers could be made. As plant and machinery for the earth quake relief is to arrive at zero rate of duty the international prices could also be competitive.

Two sizes of plant (scales of business) are envisaged.

Large scale crushing equipment

A large crushing plant (USD \$180,000 x 3) will be purchased for the earthquake affected areas. This scale of plant has a capacity of 70 Tons per hour employing primary and secondary crushers, conveyer system and ability to screen the product to different grades.

The program will seek public expressions of interest or tenders from interested parties to lease the equipment for three years. Tender / lease documentation and conditions will include the following:

- A nominal lease fee for the equipment bid by the tenderer (no significant recovery of the capital costs to the Program is envisaged, nor is it the objective).
- The equipment must be operated within the affected areas for at least 3 years and used solely for debris crushing.
- Minimum targets of volumes of debris established with the program manager.
- Due consideration will be given that the operators have past experience in similar operations and business management, providing confidence to the Program that they have the appropriate skills.
- The operator will contribute / provide ancillary equipment (trucks, loaders and hand equipment).
- The project will ensure that no monopoly of operations will take place.
- Ownership of the equipment will transfer to the lessee at the end of the 3 year term



The crushing plant above is likely to be relatively permanently located and serviced by trucks however it can be relocated within 48 hours.

Small mobile crushing equipment

Six small mobile crushers of 8 tons per hour crushing capacity will also be purchased (@ USD \$15,000 x 6). This equipment is on wheels, hand feed (wheel barrows) with power and transport provided by a small truck or tractor.

The provision of this equipment aims to facilitate entry of more modest operators into the market and the capacity to service smaller communities. The equipment will be leased under similar terms and conditions applicable to the large crushers but with lower barriers to entry i.e:

- The nominal lease fee for the equipment would be significantly lower.



- The operator would still be required to provide evidence of the equipment's appropriate use within the impacted region over at least 3 years.
- The operator would still be required to provide evidence of some business experience and appropriate skills to operate the plant and business.
- The operator would provide a tractor or truck to power and transport the crusher (+ other ancillary hand equipment, wheel barrows).
- Ownership of the equipment will transfer to the lessee at the end of the 3 year term

Business growth and volume of debris processed

Based on the capacities above, the plants will crush a total of 248 Tons of rubble per hour. Calculated over the proposed 3 year project period the total amount of rubble crushed will be approximately Two million tons based on a 10hr per day schedule. This is approximately 1% of the estimated volume of rubble in the impacted area. Clearly the immediate impact on the total volume of rubble will be minimal however, demonstratively successful crushing operations will encourage:

- The operator to invest in additional plant capacity at his own cost; and / or
- Other operators will be attracted onto the market.

It is estimated that the direct labour employed for this project would be 100 .The further indirect employment generated through sale and movement of aggregate is estimated to be 500.

Recovered lease funds

The amount of recovered lease funds will be available for investment in additional crushers or any other purpose with the approval of Steering Committee.

Component B- Landslide risk reduction, livelihoods and natural resource management

The Ministry of Environment recognises the complexity and relationship between livelihoods, land stability and forestry or vegetation retention. The Ministry has requested that the Recovery Program provide both immediate assistance and long term planning and capacity building to address this issue.

Subcomponent B1 – Fire wood substitution

The cooking and heating energy needs of both planned and spontaneous camps are a high priority for survival, maintenance of health and reasonable level of comfort for impacted communities. Reliance on firewood for this energy will result in heavy localised impacts on vegetation in the short term and increased broad scale impacts as people return to their homes heightening risks of further Landslides. As part of the relief phase, to meet the humanitarian need and reduce further impact on forests, UNDP had established a project *Meeting the Cooking and Heating Requirements of the Earth Quake Affected People of AJK and NWFP During Winter 2005-06*. The total budget of the project was US\$ 5.4 million including financial contributions from the Governments of Sweden¹



¹ The Government of Sweden contributed a total of US\$ 3.85 million to UNDP out of which, US\$ 1.5 million were allocated to this project. The remaining amount (US\$2.35 million) was allocated to Recycling of Rubble Project

(US\$ 1.5 million), Turkey (US\$ 0.5 million), Canada (US\$ 0.85 million), Switzerland² (US\$ 0.155 million), Finland (US\$ 1.17 million), Norway (US\$ 0.586 million) and Italy (US\$ 0.69 million). The project remained operational for a year, from mid December 2005 till 31st December 2006 and provided means and resources to meet heating and cooking needs of earthquake affectees in eight districts of NWFP and AJK while helping to reduce the stress on environment. 61,640 affected families provided with stand alone heating and cooking facilities (LPG kit). 200 patio heaters and fuel supplies for communal tents were provided in Mansehra through UNHCR. Heating equipment and fuel for 100 basic health units and 100 patio heaters to the Ministry of Health for emergency communal hospitals distributed through WHO and CMH. Heating equipment and fuel for 12 public baths (Hammams) were provided in Balakot. 30 community kitchens established (21 in Muzaffarabad, 7 in Bagh and 2 in Mansehra). 50 kerosene heaters and fuel supplies provided to medical camps in Rawalakot. Heating equipment and fuel supplies provided to 80 Child Protection Centers run by UNICEF. 2,500 fire extinguishers provided at strategic locations. Refilling of LPG cylinders commenced and 10,000 cylinders refilled. Distribution of 9,500 cylinders and stoves to teachers through Italian NGOs, ISCOS and Intra SOS. 150 tons of charcoal distributed in Mansehra, Bagh, Kohistan and Muzaffarabad. All communities and beneficiaries had been supported in training on fire safety and operation of equipment

The Environmental Recovery Program will work to extend and expand this project into the recovery phase as people return to rebuild. A key objective of this phase of the project will be to bring an end to the “ongoing free distribution” and shift to “a market based - but locally affordable – distribution of energy alternates” in the earthquake affected areas.

The Environmental Recovery Program shall continue to operate in the three districts of Bagh, Muzaffarabad, and Mansehra. Ten commercial operators shall be selected in each of the three districts out of suppliers of LPG cylinders under the UNDP project in operation in the earthquake affected areas. To make the gas supply affordable for the local population, LPG refill prices shall be subsidized to the extent of half the cost price of a 11.8 kg refill (Rs. 300/-) for 12 months when livelihood opportunities are not fully available. The subsidy shall be provided to 25,000 households, Each household shall be allowed 12 refills during 12 months i.e. once every month. This subsidy shall be withdrawn after 12 months.

LPG dealers / commercial operators shall also be provided with micro credit loans @ US\$ 2,000 to start their business. This amount shall have to be reimbursed at the time of completion of the project (18 months). The project manager will establish monitoring systems to gauge the establishment of commercial outlets, and the distribution of LPG refills.

Through this intervention 25,000 households – 150,000 persons (6 members in a household) shall be benefited.

The success of this subcomponent will rely on the development of livelihood opportunities to facilitate financial capacity to purchase LPG on an ongoing basis. To this end implementation will link and work closely with the UNDP / European Commission USD \$12.5 million Livelihoods Program being delivered in AJK and NWFP.



² Government of Switzerland contributed a total of US\$ 1.67 million to UNDP out of which, US\$ 0.155 million were allocated to this project. The remaining amount was allocated to Transitional Housing Project (US\$ 1.52 million)

Subcomponent B2 – Landslide vulnerability assessment/hazard mapping and Stabilization

Developing an improved understanding of vulnerability and hazard from Landslides resulting from the earthquake or further events is a priority. Many Landslides remain unstable and will be further destabilised by snow melt and monsoonal rains. Unstable slopes threaten further loss of life and homes, infrastructure (particularly roads) and water courses.

Landslides in the earthquake affected areas of NWFP and AJK is not a new phenomenon. The area is mountainous having young geology. The steep slopes, the coarse soils, shallow soil depths, low vegetation cover and high precipitation during monsoon season are the natural factors which increase the risk of landslides. Human activities such as deforestation, road construction, terracing for crop production, new habitation, irrigation and disposal of sewerage water into the sensitive areas accelerated the process of land slides, in the past.

The October 8, earthquake triggered large scale landslides in NWFP and AJK. The unstable landslides are a constant threat to the human life, communication network, relief and recovery activities, and livelihoods. The Hattian Bala was the largest landslide occurred in 2005 causing colossal loss to life and property. The land slide in Hussari Nullah put an enormous amount of debris in River Kunhar. Last year, about 23 villages were declared at risk due to expected landslides in the monsoon season. Out of these, 18 villages were evacuated before the monsoon rains.

NESPAK (National Engineering Services Pakistan) and GSP (Geological Survey of Pakistan) studied the landslides occurred as a result of earthquake with the following objectives:

- To identify the currently existing landslides
- To assign hazard rating to the existing landslides based on their potential to damage life and property under the present condition and with possible enlargement in future
- To map and evaluate the hazard of potential landslides, as much as possible (those landslides that can be triggered in the near future especially during the rains, as the mountains in the area have been shaken up and have developed cracks which could be a catalyst for landslide generation)
- To try to predict what landslides could be triggered if any of the other known faults in the area was to trigger an earthquake
- To formulate a strategy for hazard mitigation.

As the total earthquake affected area is large (30,000 sq. km), the study focus is in and around the major cities and towns and around the major road links, an area of 10,000 sq. km. The basic desk study of landslide mapping from satellite imageries has since been completed. More than 600 landslides have been mapped, mostly on the basis of colour differentiation. Field teams are ground truthing to verify the landslides already delineated by the desk study and to identify ones that have not been picked up. ERRA's "Reconstruction and Rehabilitation Strategy for Environment Sector" reports 242 landslides near active roads in the earthquake affected area. The assessment will provide a comprehensive picture, and detailed information on the existing landslides and their potential hazard, which will facilitate formulating future strategy and action plan for minimizing risks from these landslides.

At the request of NESPAK / GSP, the Environmental Recovery Program, will provide additional assistance to build on the existing project to achieve a higher quality result as quickly as possible. The following assistance will be provided:

- Provide / procure additional high resolution digital imagery - to be owned by the Government of Pakistan for collective use in the reconstruction efforts.
- Provide enhanced training by an International GIS specialist and a Geologist (two ten day missions by each specialist) to develop the skills of local GIS and geological staff.

Proposed Initiatives for landslide/slope stabilization:

The study of NESPAK /GSP will inform the preparation of detailed intervention plan for landslide stabilization. The landslides/slopes with the higher hazard ranking will be selected for integrated slope

stabilization. An estimated 70 number of landslides/slopes will be treated for stabilization through the following measures:

a. Curative measures to stabilize active landslides

Moisture contents of the soil have an important role in disturbing the shear stress and shear resistance balance. Therefore for landslide stabilization measures are undertaken as far as possible to minimize the water contents of the slide area in addition to strengthen the toe of the slide. For the conditions prevailing in NWFP and AJK the following measures are economical for the stabilization of landslides.

i. Engineering Works

Engineering works will include construction of following structures:

Cutoff Drains (Diversion channels): Cutoff drains are essential for preventing the additional runoff from the up slope to enter into the slide area. The cutoff drains will be designed according to expected runoff above the slide area.

Surface Drains. The rainfall falling on the landslide is also sufficient enough to saturate soil in monsoon and winter season therefore it is also necessary to dispose off the runoff produced on the slide area.

Retaining Walls: Retaining walls are necessary to stabilize the slides, which are triggered due to removal of toe of the slope at the road cut or by peak flows of rivers. There are different types of retaining wall such as gabion, stone masonry, live brushwood, vegetated soft gabion and vegetated loose stones retaining walls. The selection of the type and design will be according to local conditions.

ii. Bio-Engineering Measures:

Before planting and sowing, bio-engineering treatments will be given for temporary stabilizing the bare soil surface. Suitable bio-engineering (bio-technical) out of the following techniques i. brush wattles, ii. brush layering, iii. brush- hedge layering, iv. Brush wood fences, v. semi-dead brushwood fences, vi. hedges and vii. sodding, will be selected for fixing of the slopes before planting. The drainage lines on the slides will be treated with live brush wood check dams and vegetated palisade.

iii. Biological Measures:

Biological measures are for the re-establishment of vegetation on the slide area. For quick recovery of vegetation planting and sowing of trees, bushes and grasses is needed. The selection of tree species is important for planting on the landslides. The species should be fast growing, must have deep and strong root system, should be suitable for the climatic zone and have high consumptive use of water. Planting will be supplemented by planting of cuttings, tuft planting of grasses and sowing of natural trees shrub and grasses

The slope stabilization activities will be dovetailed with the integrated forest management plan (B3), and the following activities will be incorporated to strengthen capacity and awareness raising about landslide risk mitigation:

b. Capacity Building (Training)

The important component is the capacity building of the agencies involved in the landslide stabilization in AJK and NWFP. The capacity will be developed through arranging short courses on slope stabilization and landslide control for the officers and the staff of the Forest and Roads/C&W department. A Field Manual on Soil Conservation and Slope stabilization will be published to provide the field staff a field guide for future. The training material will also be prepared in Urdu for guidance of staff of the forest and Roads/C&W departments.

c. Awareness Creation about the management of slope stabilization

Slope stabilization is a huge task and cannot be tackled through implementation of projects, only. It should be a regular feature and built in system in the government of AJK and NWFP for tackling the landslide stabilization program. For this purpose a strong awareness creation program is needed for making the people aware about the future risk of expected damages due to landslide. Through awareness program the communities have to be made aware that the deforestation, terraces construction, road construction, are the causes of landslide in addition to natural factors and should be avoided.

The policy makers has to be convinced to make policy for having inbuilt program for landslide stabilization program, make strong legislation to stop practices which can increase the risk of landslide. For this purpose awareness workshops and meeting will be held.

d. Development of Coordination among different Stakeholders:

Another important activity will be to develop a strong coordination among the different stakeholders for landslide stabilization activity. The coordination of Roads, C&W, Forest, Soil Conservation, Geological Survey of Pakistan and agriculture departments of NWFP and AJK is needed for landslide stabilization program under Planning and Development Department of both the governments.

Subcomponent B3 – Integrated forest management plan and implementation through livelihood opportunities

The forests have equally been affected by the earthquake. The extent of damage determined so far is as follows

(Source: Presentation given by the Deputy Inspector General of Forests, Ministry of Environment to the Federal Minister):

AJK

Area in Acres

District	Government forest area	Forest damaged area	Private areas badly damaged (trees, shrubs, grass)
Neelum valley	677,258	86,413	35,320
Muzaffarabad	218,168	165,808	184,987
Bagh	156,075	78,038	90,982
Poonch	65,420	32,000	19,840
Sudhnuti	55,520	10,000	7,200
TOTAL	1,172,441	372,259	338,329

NWFP

Area in Acres

District	Forest area	Landslide damage Govt forest	Forest damage	Private area terraces, trees, shrubs	Private area, wasteland
Abbotabad	135,574	0	0	328	1,200
Mansehra	323,532	2,925	29,000	1,143	2,300
Batagram	175,000	2,000	6,500	672	1,500
Hazara/kohistan	463,388	2,000	21,000	250	750
Shangla	109,727	500	4,750	361	1,200
TOTAL	1,207,221	7,425	61,250	2,754	6,950

Forms of damage to the Forests

Area in Acres

Form of damage	AJK	NWFP
Heavy landslides (land turned over)	112,500	7,425
Threatened area (root system damaged)	187,000	135,250
Threatened areas (anticipated new slides)	70,000	2,500
Regeneration area	2,759	1,500
Buildings / infrastructure (sft)	193,063	276,149
Roads (km)	256	105

The tenure of forests is both Public and Private. There is however, a difference in the tenurial arrangements in AJK and NWFP. Almost all the productive forests in AJK are state owned, and the forestry in the private sector is restricted to agricultural lands and rangelands. In NWFP however, the productive forests also occur on the communally owned or Guzara forests. The management of the public and private forests requires different treatments.

The deforestation in NWFP and AJK is the outcome of competing pressures and lack of local capacity to manage a challengingly complex socio political environment. Denuded slopes correlate with Landslides and have resulted in devastating loss of life and infrastructure. Revegetation projects will not succeed without community engagement and ownership of the solution which must acknowledge local needs and incorporate livelihood opportunities.

At the request of the Ministry of Environment the Recovery Program will provide for the development of a fully integrated forest management plan with funds to commence implementation. The plan will be led by a community development professional supported by local technical expertise in livelihood potential and forest management practices. The completed plan will provide for immediate implementation through community based propagation and planting programs and be the foundation for future investment in reforestation projects.

It is proposed to obtain the services of two international community development / forestry professionals / experts. They shall intensively study the forest management systems and the related socio /economic / cultural system both in AJK and NWFP in general and earthquake affected areas in particular for both successful and unsuccessful models. Recommendations will be made including proposing models for future sustainable management and implementation of planting programs in both the state and private forests. These models will acknowledge the social/political/governance realities associated with this industry over recent decades to drive secure effective future investment.

In addition two forest areas, one in Blue pine zone in Bagh district (AJK),and one in Chir pine zone in Siran valley, Mansehra district (NWFP) shall be selected for comprehensive management planning at the watershed level. The Plan shall be prepared within a period of 8-9 months. Implementation of the Plan may start in the 2nd year of the project. The project though being presented for a period of three (3) years, the implementation of the plan should continue for the full term of the plan which may be ten (10) years. Special focus of the management plan shall be community based management of forest areas, both in the Public and Private sectors, especially focusing on livelihoods and the community skills enhancement. Fruit tree planting shall be emphasised in privately owned agricultural areas.

The interventions provided in the Plan may include raising of tube and bed nurseries, sowing / dibbling of seed in field areas, raising of field plantations and agro silvicultural plantings, improvement of grazing practices and the natural rangelands. Targets of such works shall be determined / presented in the Plan.

Subcomponent B4 – Forest Department capacity building and community outreach

Forest Department officers are frequently the most accessible government representatives for remote mountain communities. At the request of the Ministry of Environment the Recovery Program will engage local experts / academics in seismology and land stability to design a training program to equip Forestry, Agriculture and Livestock and Dairy development department staff with information to disseminate knowledge and risk management to local communities. The staff training program will be delivered through existing forestry training facilities.

About 250 staff shall be trained to act as trainers and mass awareness agents who shall train 70,000 community members in risk mitigation.

Selection of Communities

The selection process will be based on the previous experience of UNDP, implementing partners and other stakeholders taking into account:

- Location of project interventions will be selected keeping in view the nature and kind of donor assistance received by the communities in the past. Project focus will be on those communities who have little attention of the Govt. / donors.
- Willingness to take up the responsibility of operation and maintenance for the schemes after its completion.
- Willingness to collaborate and participate in the programs of local Governments for tapping additional resources for the entire community.

Cross- cutting Issues (gender and disabled persons)

As the construction of buildings begins the people will start cutting trees to meet the needs of timber, leading to deforestation at a large scale. Therefore, the project will involve the communities in growing plant nurseries, which will become income-generating activities on long-term basis. The communities will also be engaged in tree plantation on communal lands and proper watch and ward of the young trees as paid labour. This activity will help in mitigating the environmental effects.

UNDP's past experience in AJK indicates that women work side by side with men, so they will be the equal beneficiaries of the project. However, NWFP is relatively more conservative. The project team will make concerted efforts to establish separate women community groups so that they can also benefit from the project interventions. For reporting the project will keep data segregated on the basis of gender to ensure that the needs of women are adequately addressed to ensure economic empowerment.

The project team will pay special attention to the needs of the disabled / handicapped people to help them return to their normal lives by identifying trainings for their income generation activities. This will help to minimize beggary and social burden on the others.

Stakeholders

The principal stakeholders are: local communities, NGOs working in the area, Local / District Administrations, Provincial authorities, Economic Affairs Division, MoE, ERRA, and implementing partners.

During project implementation, the target areas and communities will be identified in consultation and coordination with relevant stakeholders, namely the Government entities, donors and NGOs working in the area. Especially the project will maintain a close liaison with the local authorities (District Coordination Officers / Nazims, Deputy Commissioners). Through participatory need assessments in the target communities, livelihood activities will focus on what matters to people's lives, identify the assets, entitlements, activities and knowledge base which people are currently using to make their living. The selection of direct beneficiaries will take place via a responsive and participatory approach, thereby ensuring that the members of the community are identifying the priorities as well as the most appropriate mechanisms to achieve meaningful economic progress. Special emphasis will also be placed on meeting the needs of the handicapped people, such as provision of wheel chairs, home-based training, and supply of raw materials, etc., for product making at home so that these people are also fully involved in the project activities.

Partnerships and Inter Project Linkages

The project will work in close coordination with the UN Agencies engaged in the earthquake affected areas together with the Ministry of Environment, ERRA and the Governments of AJK and NWFP. Based

on the need assessment and activities to be performed, the project will provide resources to ERRA for implementing activities / fielding experts. Organisations such as IUCN, WWF and Aga Khan Foundation have gained vast experiences in many of the program areas. Therefore, the program will continue to exchange information with them and to involve these organizations during the implementation phase. Likewise, resources will also be provided to credible national NGOs, for implementing activities. Resource allocation will be based on the requirement to implement activities.

Clearly defined functional relationships and support mechanisms will link the project with other components of the Early Recovery Programme (ERP) prepared by UNDP. The project will also utilize the experience of other UNDP funded Area Based Programmes and the Mountain Areas Conservancy Project operational in the region, by regular exchange of information.

Sustainability

The Program is guided by sustainability principles aiming to “strengthen institutional and community capacity to mitigate, rehabilitate and manage the environmental impacts of the earthquake to provide for safe healthy, viable communities”. A capacity building approach to skills provision in rehabilitation and reconstruction has been adopted to ensure skills are “left behind” after the reconstruction phase has been completed rather than importation for short term gains.

The waste and debris management components follow well established sustainability principles (the three Rs of reduce, reuse, recycle). The Program will provide expertise and equipment to reuse and recycle debris before the remainder is safely disposed.

The final component of the Program aims to mitigate further impact on the remaining vegetation and develop planning instruments to facilitate a long term move toward more sustainable forestry practices and vegetation management.

Management Arrangements

The Environmental Recovery Program is a joint program of UNDP, UNEP, ERRA and the Ministry of Environment. The Programme will be implemented according to the DEX modality. Key partners include the Provincial and District units of ERRA, other agencies, local and international NGOs. The Program structure and reporting arrangements are expressed diagrammatically below with explanation as follows.

Project Steering Committee

A Project Steering Committee will be constituted, which will be co-chaired by ERRA and UNDP, with membership including EAD, MoE, governments of AJK and NWFP and UNEP. The Committee will meet twice a year or on need basis to receive and review progress reports from each component and subcomponent and provide direction for smooth implementation of project activities. The Committee will provide high level coordination and advice to the Program and Project managers and implementation partners.

Project Implementation

A National Project Coordinator/National Project Manager with expertise in natural resource management, and soil and land stability will be responsible for the over all implementation of the Project. A Project Manager with specialization in waste and debris management and an NRM and Land Stability Expert will assist the NPC/NPM in realization of the outputs of the Project. The Project Team will work in close collaboration with all the implementing partners—MoE, SERRA, PERRA, DRUs, and UNEP, and will keep the Project Steering Committee and ERRA informed on the progress of the Project.

International Technical Advisor (UNEP)

UNEP will provide an International Technical Advisor (ITA) for 12 person-months on split mission basis over a period of two years. The ITA will provide technical input and assist the programme management in preparation of various technical and sectoral reports. UNEP through ITA will provide advice to the UN country team and other implementing partners.

UNEP, in close collaboration with UNDP will provide secretariat resources to the Environmental Protection Cell (EPC) of ERRA and support Core Group of ERRA and General Advisory Group for Environment in functioning as an umbrella organization for the earthquake related environmental activities carried out in Pakistan. The Group will be under the auspices of ERRA and embrace all key stakeholders, including UN agencies, relevant NGOs and government agencies. Membership will include those directly involved in the Recovery Program and those with broader interests.

Waste / debris management

The Waste/ debris management component is to be implemented jointly with the tehsils municipalities. A full-time project manager, supported with a small team for field operations, will oversee the implementation under this component. The mass awareness and sensitisation activities would be done through local government institutions and NGOs. A four members field team would be hired on a short-term contract to undertake on-ground verification of GIS based assessment of the debris volume.

The sub-component on debris crushing and reuse would be implemented through the private contractors to be hired by the project. Sites specific detailed work contracts would be prepared after the assessment of debris volume and its reuse potential is completed. Specialised services of a tendering expert on civil works would be hired by the project to formulate the tendering documents. The implementation monitoring of the sub-component would be the responsibility of the component project manager and the officials of local government involved in the civil works.

Slope stabilization, livelihoods and natural resource management

This component by design has fairly distinct activities and would require to be resourced with staff having varied qualifications and experience for each sub-component. The overall supervision of this component will be the responsibility of a National Project Coordinator/National Project Manager, who would be assisted by a specialist in slope stabilization and NRM posted at Muzaffarabad to manage and implement activities in AJK and NWFP. The sub-component on fire wood substitution would be implemented by three field teams with the main responsibility of establishing local network of dealership of LPG by bringing together the LPG supplying companies and the locals interested to own/operate the dealership. The field team would also monitor the actual coverage of LPG in affected areas and recommend rectification in the distribution networks.

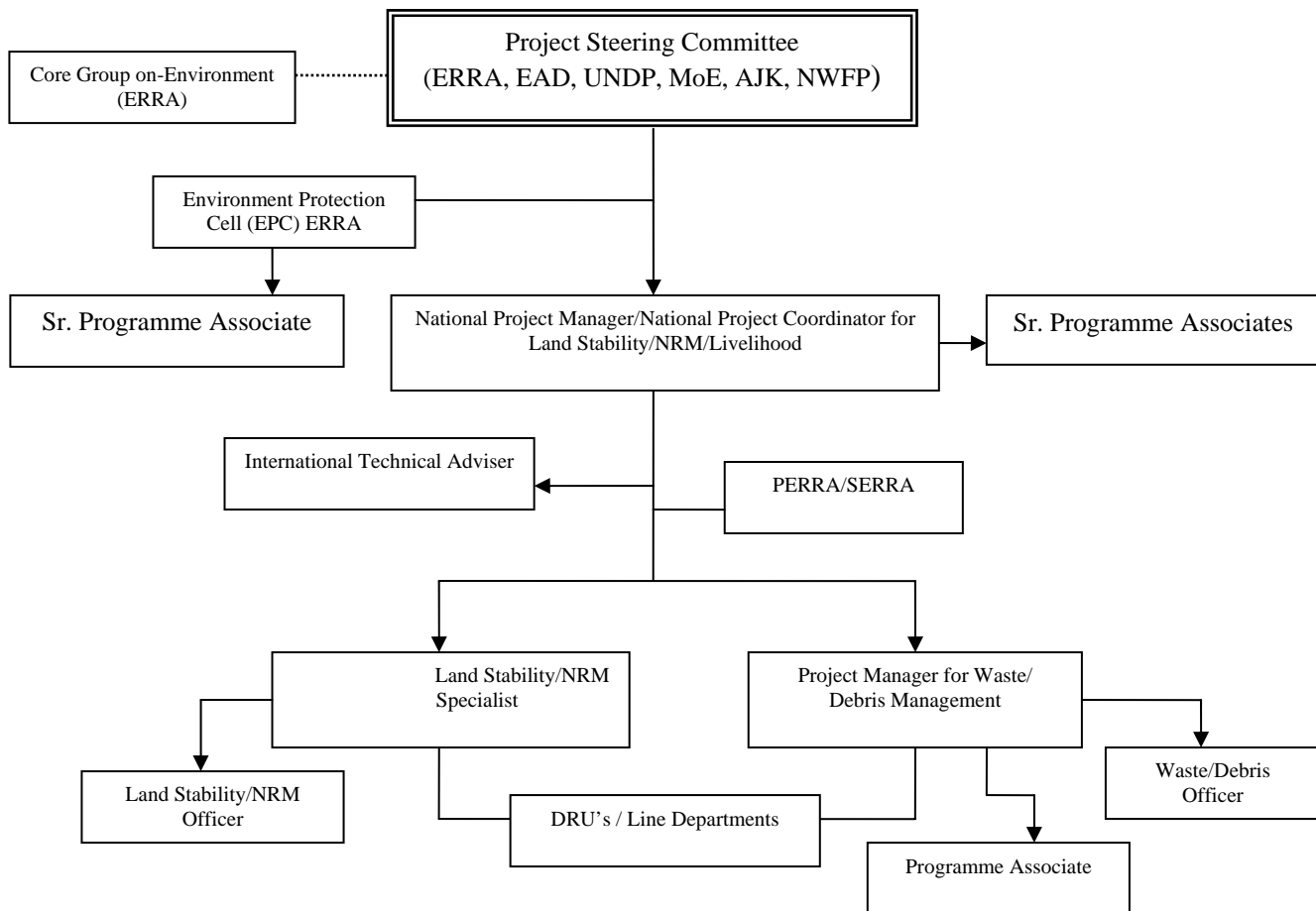
“Landslide vulnerability assessment and hazard mapping” will be implemented through NESPAK and Geological Survey of Pakistan.. The slope stabilization activities will be implemented in collaboration with the Forest Departments and other relevant district government departments. Assistance from Roads/C&W departments will be sought, if required for large scale landslides. The NPC/NPM would ensure that the deliverables under this sub-component are well defined and are in line with requirements of ERRA/SERRA/PERRA.

A team of national/international experts would prepare the “Integrated forest management plan”. The plan would be implemented in select watersheds of districts Bagh and Mansehra through two field teams with expertise in social mobilisation, agriculture, watershed and natural resources management. Since this particular sub-component is going to continue on a longer timeframe funds would be secured during the initial three years to continue the implementation activities beyond the recovery phase.

The sub-component on “Forest Department capacity building and community outreach” will be implemented under an implementation agreement with an NGO having comparative advantage in this area. The NGO would have to develop different sets of training modules that can be imparted to different

target audiences. The component project manager will develop the required terms of reference, in consultation with government departments, for the NGO to be involved to undertake this activity.

Organizational Chart
Environmental Recovery Programme for the Earthquake Affected Areas



Monitoring and Evaluation

The project's management will be responsible for the production of results to achieve the objectives and set targets. At the initiation of the project, a benchmark survey will be carried out and indicators and other monitoring tools such as interviews, questionnaires and case studies will be reviewed / refined through a participatory, stakeholders analysis workshop. Information gathering approaches / methods will be designed and responsibilities for collection, analysis and management of monitoring information will be shared amongst stakeholders and project staff. Overall benchmark statistics of Pakistan are available in the UNDP Human Development Reports and other documents and reports of UN Resident Coordinator. The baseline data and benchmark statistics will serve as inputs to future evaluations. Special studies will be conducted to monitor the impacts.

The technical and financial reports will be submitted to all partners including ERRA, UNEP and donors on quarterly basis as per policy and procedures of UNDP and as required by ERRA on need basis. There will be an annual and terminal report of the project, which will be widely circulated among the stakeholders. The project will participate in outcome evaluations as and when planned by UNEP, the UNDP Country Office / Evaluation Office. The project will be subject to annual assessments, in accordance with UNDP/UNEP rules.

Legal Context

The legal context for UNDP-assisted programmes and projects in Pakistan is established by two major agreements: 1) the Convention on the Privileges and Immunities of the United Nations, given effect by Act XX of 1948 of the Pakistan Constituent Assembly (Legislative) and assented to 16 June, 1948; and 2) the agreement between the Government of the Islamic Republic of Pakistan and the United Nations Development Programme concerning assistance under the Special Fund Sector of the United Nations Development Programme, signed by the parties on 25th February 1960.

This Project Document shall be the instrument (therein referred to as a Plan of Operation) envisaged in article 1, paragraph 2, of the agreement between the Government of the Islamic Republic of Pakistan and the United Nations Development Programme concerning assistance under the Special Fund Sector of the United Nations Development Programme.

UNDP-assisted programmes and projects for Pakistan are planned and executed in accordance with the global UNDP Financial Rules and Regulations and the Project Cycle Operations Manual for Pakistan.

The following types of revisions may be made to this project document with the signature of the UNDP Resident Representative only, provided he or she is assured that the other signatories of the project document have no objection to the proposed changes:

- Revisions in, or addition of, any of the annexes of the project document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of a project, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation; and
- Mandatory annual revisions which rephrase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility.

This project document shall be the instrument envisaged in the Supplemental Provisions to the Project Document, which are available.

Visibility Strategy

The project will be responsible for publicizing the activities of the programme, donor, and the Government consulting guidelines on visibility. The project will ensure that the sub-projects will be announced through UNDP / UNEP in order to keep the local populations fully informed of the decisions made by their local representatives. The project will arrange regular, publicized events to highlight the progress of the project. Project signboards will be produced and placed at several highly visible locations around the

target project locations. Each signboard bears the logos of the donor, implementing partners, UNDP, UNEP, MoE and the title of the project.

Reporting Modality

UNDP / UNEP will prepare regular and comprehensive progress reports on the status of the project implementation. An initial report will be prepared six months after the start of the project followed by progress report every six months. The final report will be given 60 days after the completion of the project.

Duration and Action Plan

The total project duration is 36 months.

A Logical Framework Analysis follows as Annex 1 including objectives, indicators and targets. The key activities and budget on yearly basis are provided in Annex 2.

Annex 3 contains a quarterly Work Plan over the three years of the project's duration.

Programme Financing

The total budget for the Programme is USD 12.8 million. This includes the standard General Management Services (GMS) Fee applicable on all cost sharing agreements with bi-lateral and multi-lateral funding partners and Implementation Support Services (ISS) Fee applicable when the UNDP Country Office is the designated IP. The GMS has been kept at 5% for UNDP administered activities and 7% for UNEP administered activities and ISS at 3% for UNDP activities. However the actual apportionment for GMS and ISS would be based on the funds received from the funding partners of the programme. The Budget for Action is attached at Annex 4.

Annex 1 - Logical Framework Analysis

	Objectives	Indicators	Sources of Verification	Risks and assumptions
Overall	Strengthen institutional and community capacity to mitigate, rehabilitate and manage environmental impacts of the earthquake to provide safe, healthy, and viable environment for communities.	<ul style="list-style-type: none"> • % volume of debris reused • No. of appropriately selected and constructed licensed dump sites • % of vegetation cover (maintenance) over the next 5 years and % increase over subsequent decades • % of communities with access to a basic understanding of local seismic and landslide vulnerability • %age of identified slopes treated 	Monitoring reports, Project progress reports, Field visits, and Government reports	No further natural disasters, law and order situation remains peaceful and Government and other stakeholders support continues
Specific objective 1	To build expertise and capacity in Waste/Debris Management, quantification of the volume of Debris and provision of crushing plants to facilitate reuse of debris.	<ul style="list-style-type: none"> • Improved awareness of stakeholders on Waste/debris management • Accurate understanding of the volume of debris and its management options • Commercially viable debris crushing plants established 	Workshop reports, Project assessment reports	As above, and interest of public sector in commercial opportunities
Specific objective 2	To reduce the landslide damage, minimize impact on forests, improve vegetation cover, improve livelihood opportunities, strengthen communities and train the staff in disaster management.	<ul style="list-style-type: none"> • Improved information on location, scale, and associated risks on landslides • Landslide/soil stabilization activities including engineering and bioengineering and biological measures carried out and sustained • The market for LPG trade established and functional in three focal districts • A cadre of Government officers trained in disaster management and capable of acting as mass awareness agents 	As above	As above

Specific Project Purpose	Intervention Logic	Indicators	Sources of Verification	Risks and assumptions
1.(a) Build the expertise and capacity for safe and efficient handling of the waste and debris.	The enormous waste and debris needs to be effectively managed. UNEP will conduct waste management workshops to facilitate capacity building of the stakeholders such as Government staff, military, NGOs and other agencies responsible for waste management or disposal.	<ul style="list-style-type: none"> improved awareness of waste management issues employment of best practices in waste / debris management 	Monitoring reports, Field visits, Government reports & records	Political and institutional support for genuine consideration of environmental impact of waste / debris management
Results	Outputs	Targets	Sources of Verification	Risks and Assumptions
Inappropriate disposal of rubble and debris disposal into rivers and streams ceased.	Better informed waste and debris management decision making.	<ul style="list-style-type: none"> Two workshops on waste management delivered for 50 to 60 stakeholders responsible for waste management, trained in best practices 	As above	As above
Specific Project Purpose	Intervention Logic	Indicators	Sources of Verification	Risks and assumptions
1.(b) Estimate the volume and type of debris in the selected areas of three districts of Muzaffarabad, Bagh and Mansehra identified through a consultative process, GIS and “ground truth” assessment methods.	The Ministry of Environment and ERRA have requested an estimate of the volume of debris in districts of Muzaffarabad, Bagh and Mansehra. Quantification of the volume of debris and its type is necessary to plan for its reuse or ultimate disposal.	<ul style="list-style-type: none"> Estimate of the volume of debris available 	Assessment Report	As above Well trained ground truthing staff
Results	Outputs	Targets	Sources of Verification	Risks and Assumptions
An accurate estimate of the volume of debris available to decision makers.	An accurate GIS based ground truthed estimate of the volume of debris.	<ul style="list-style-type: none"> Accurate assessment of the volume of debris 	As above	As above

Specific Project Purpose	Intervention Logic	Indicators	Sources of Verification	Risks and assumptions
1.(c) Provision of crushing infrastructure & livelihood support.	Large volumes of rubble are currently being dumped in or along side water courses resulting in increased silt loads and unstable fill sites. Debris is potentially valuable as crushed aggregate for reconstruction. Skills exist in the region commence commercially driven crushing operations.	<ul style="list-style-type: none"> commercially viable crushing operations established Employment and livelihood opportunities realized 	As above	As above, and interest of commercial operators
Results	Outputs	Targets	Sources of Verification	Risks and assumptions
Private contractors investing in public private partnerships to manage debris for a commercial return.	<ul style="list-style-type: none"> Debris crushed and commercially available for reuse as aggregate in reconstruction 	<ul style="list-style-type: none"> 3 large crushing plants established in three districts of Muzaffarabad, Bagh and Mansehra 6 small mobile crushing plants procured and commissioned to be moved to areas of activity 	As above	As above

Specific Project Purpose	Intervention Logic	Indicators	Sources of Verification	Risks and assumptions
2.Reducing the landslide risk, minimizing the impact on forests, and improving livelihoods.	Earthquake affected areas are the important watersheds of Mangla and Tarbela dams. Forests and vegetation are the important components of watersheds. Retention of vegetation cover and plantation on Landslide sites vegetation would be helpful in reducing the silt load in nullahs and rivers and ultimately in the water reservoirs, improve the water quality and reduce the environmental hazards. The community based management of forests shall improve the livelihoods.	<ul style="list-style-type: none"> LPG has been popularized with the inhabitants of the area, which has reduced pressure on forests Management plan for the focus area is under implementation CBOs are functional and involved in forestry and land stabilization works, and links with established Joint Forest Management Committees established Landslide stabilization works are in progress Reduced traffic hazards on roads Improved communication system More cooperation of local communities in forests' protection 	Monitoring reports, Project progress reports, Field visits, Government reports	Political and institutional support for genuine consideration of environmental impact in reconstruction and rehabilitation projects.
Results	Outputs	Targets	Sources of Verification	Risks and Assumptions
Firewood use from the natural forests minimized,	<ul style="list-style-type: none"> Alternate energy sources in use Improved forest cover, livelihoods and 	<ul style="list-style-type: none"> 3x10 Commercial LPG outlets are functional in three districts 	As above	As above

<p>Landslides stabilized at selected locations, water quality improved, land use plans in operation, livelihoods improved, and loss of life and property reduced</p>	<p>awareness;</p> <ul style="list-style-type: none"> • Improved and stabilized slopes • Reduced pressures on forests • Improved disaster management skills • Landslide management capacity of line departments improved • Policy recommendations for inbuilt system for future landslide control formulated 	<ul style="list-style-type: none"> • 25,000, 11.8 kg LPG refills provided to the community for 12 months • 10,000 sq. km area GIS surveyed and ground truthed • A strategy for hazard mitigation formulated • Management recommendations for forests of AJK and NWFP given • Management Plan for focus watershed areas written • Landslide stabilization works dovetailed with forest management • 70 landslides/slopes treated through engineering, bioengineering and biological measures • Community organizations (new) 10 male and 10 female formed • Strengthening of CBOs (old) 10 male and 10 female • Community schemes implemented (20) • Publicity / Extension material • Exchange visits Staff and community) 20 • Training, 250 master trainers government staff • Awareness campaign targeting 70,000 Community members 		
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Annex 2 - Activity Based Budget

	Key Activities	Unit	Activity target				Responsible partners	Planned USD	Budget		
			Total	Year 1	Year 2	Year 3			Year 1	Year 2	Year 3
Ourput 1: Waste / debris management	A1 Waste / debris management workshop										
	waste mgt workshops at Mansehra & Muzaffarabad		2	2	-	-	UNEP, UNDP	30,000	30,000	-	-
	2nd round waste mgt workshops at Mansehra & Muzaffarabad		2	2	-	-	UNEP, UNDP	30,000	30,000	-	-
								60,000	60,000	0	0
	A2 - GIS assessment & quantification of debris volume										
	data purchase and interpretation		1	1			UNOSAT	39,858	39,858		
	Ground truthing by local staff		1	1			UNOSAT, UNDP, UNEP	11,000	11,000		
								50,858	50,858	-	-
	A3 - Crushing Infrastructure & livelihood opportunities										
	procurement of large crushing plant @ 3 x 180,000		3	3			UNEP, UNDP	540,000	540,000	-	-
	procurement of mobile crushing plant @ 6 x 15,000		6	6			UNEP, UNDP	90,000	90,000	-	-
	tender drafting, letting and evaluation		1	1			UNEP, UNDP	1,000	1,000	-	-
								631,000	631,000	0	0
	Total							741,858	741,858	0	0

	Key Activities	Unit	Activity target				Responsible partners	Planned USD	Budget		
			Total	Year 1	Year 2	Year 3			Year 1	Year 2	Year 3
Output 2: Slope stabilization, livelihoods and natural resource management	B1 - Firewood substitution										
	Firewood substitution, start up grant, LPG dealers @US\$ 2,000 each	loan		30	-	-	UNDP	60,000	60,000	0	0
	Subsidy for LPG refills in three districts @ Rs.300 per cylinder			25,000	-	-	UNDP	1,500,000	1,500,000	0	0
	Subcomponent staff, equipment, travel and monitoring @ 20% of budget						UNDP	312,000	124,800	124,800	62,400
								1,872,000	1,684,800	124,800	62,400
	B2 - Land stability and hazard mapping										
	Procurement of high resolution data, and interpretation						NESPAK GSP, UNOSAT	41,580	41,580		-
	2 x International Expert missions of 10 days each to deliver advanced GIS and Geological for training for local staff	missions	2	2			NESPAK GSP, UNOSAT	40,000	40,000		-
	Land/Soil Stabilization measures (6,007,667)										
	i) Engineering Works such as retaining walls (concrete, masonry, gabions), diversion channels, surface drains and gabion check dams, etc.							2,600,000	1,000,000	1,600,000	
	ii) Bio-Engineering works such as brush wattles, brush layering, hedge layering, brush & hedge layering, brush fences, sodding, live brush retaining walls and live brushwood check dams, etc.							2,200,000	800,000	1,400,000	
	iii) Biological measures such as planting and sowing of trees and bush species, planting of tufts etc.							1,207,667	411,794	795,873	
	Subcomponent staff, equipment, travel and monitoring @ 5% of budget							304,462	114,669	129,793	60,000
							6,393,709	2,408,043	3,925,666	60,000	

B3 - Integrated forest mgt plan, livelihoods and NRM										
International consultants (IC), Local consultants(LC)			8-10 months			UNDP< Forest Departments AJK, NWFP	150,000	150,000	0	0
Implementation of the Plan, targets to be fixed in Plan				Targets	Targets	UNDP Forest Departments of AJK, NWFP	850,000	0	450,000	400,000
Subcomponent staff, equipment, travel and monitoring @ 25% of budget							250,000	37,500	112,500	100,000
							1,250,000	187,500	562,500	500,000
B4- Capacity building & community outreach										
Training of trainers in risk mitigation, capacity building and community outreach	staff commty	250 70000	150 40000	100 30000		UNDP forest Departments AJK and NWFP Agri and Livestock Deptt.	52,000	30,000	22,000	-
Subcomponent staff, equipment, travel and monitoring @ 10% of budget							5,200	3,000	2,200	
							57,200	33,000	24,200	0
Total							9,572,909	4,313,343	4,637,166	622,400

Annex 3 - Work Plan

Expected Output	Key Activities	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1: Waste / debris management	Deliver two waste mgt workshops at Mansehra NWFP & Muzaffarabad AJK												
	Deliver 2 nd round waste mgt workshops at Mansehra & Muzaffarabad												
	Undertake GIS based assessment and estimation of volume of waste												
	Ground truth GIS assessment of waste volume												
	Procurement and manufacture of crushing equipment												
	Draft, advertise and award tenders for operation of crushing equipment												
	Operation, commercialisation and evaluation of crushing plant												

Annex 3 - Work Plan (continued)

Expected Output	Key Activities	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output2: Landslide risk reduction, livelihoods and natural resource management	Start up grant for commercial LPG outlets												
	Provision of refills - subsidized												
	Supply of refills to continue without subsidy												
	Procurement of Aerial photographs, 5-10 grid data, software												
	Training of local scientists by international experts												
	Local scientists working on the Project: Landslide mapping and ground truthing												
	Management recommendations and Management Planning for forests												
	Implementation of Management Plan, Forestry works, landslide stabilization works, Engineering and Bio-engineering works. CBOs working												
	Preparation of material for training in Disaster management and awareness												
	Training of Government staff and community members												

Annex 4 - Budget for the Action

Expenses	Unit	No. of units	Unit rate	Donor	Implementing Partner	USD Cost			
						Total	Year 1	Year 2	Year 3
1. Human resources									
1.1 Salaries (gross amounts local staff)									
1.1.1 Technical									
National Project mgr - landslip risk reduction, livelihoods & NRM	/ months	36	3,500		UNDP	126,000	42,000	42,000	42,000
Project manager - waste/debris management	/ months	36	3,000		UNDP	108,000	36,000	36,000	36,000
NRM/Land Stability Specialist	/ months	36	3,000		UNDP	108,000	36,000	36,000	36,000
1.1.2 Administrative / support staff									
2 x Senior Programme Associates	/ months	72	1,500		UNDP	108,000	36,000	36,000	36,000
1 x Programme Associate	/ months	36	1,200		UNDP	43,200	14,400	14,400	14,400
1 x Waste/Debris Officer	/ months	36	1,500		UNDP	54,000	18,000	18,000	18,000
1 x NRM/LS Officer	/ months	36	1,500		UNDP	54,000	18,000	18,000	18,000
1.2 Salaries (gross amounts, international)									
1.2.1 Technical									
International Technical Advisor*	/ annum	2	100,000		UNEP	200,000	100,000	100,000	
1.2.2 UNEP Geneva Support									
administration support*	/ annum	2	35,000		UNEP	70,000	35,000	35,000	
Subtotal Human Resources						871,200	335,400	335,400	200,400
2. Travel									
Local	/ annum	3	7,000		UNDP	21,000	7,000	7,000	7,000
International	/ annum	3			UNDP	40,000	10,000	20,000	10,000
International*	/ annum	2			UNEP	50,000	30,000	20,000	
Subtotal Travel						111,000	47,000	47,000	17,000
3. Equipment and supplies									
vehicles	vehicle	3	35,000		UNDP	105,000	105,000		
computers & furniture		2	20,000		UNDP	40,000	40,000		
subtotal equipment and supplies						145,000	145,000		
4. Local office / Action costs									
vehicles operation	Vehicle		6,000		UNDP	54,000	18,000	18,000	18,000
office rent	/ annum		40,000		UNDP	120,000	40,000	40,000	40,000
office supplies	/ annum		12,000		UNDP	36,000	12,000	12,000	12,000
utilities	/ annum		12,000		UNDP	36,000	12,000	12,000	12,000
subtotal local office /action costs						246,000	82,000	82,000	82,000
5. Other costs, services									
publications	/ annum				UNDP	12,000	4,000	4,000	4,000
Audits	/ annum		5,000		UNDP	15,000	5,000	5,000	5,000
monitoring and evaluation	/ annum				UNDP	40,000	5,000	5,000	30,000
conferences, seminars, staff training	/		25,000		UNDP		25,000	25,000	25,000

	annum					75,000			
media, publicity	/ annum		10,000		UNDP	30,000	10,000	10,000	10,000
subtotal other costs, services						172,000	49,000	49,000	74,000
6. Activity costs detailed annex 2									
A- Waste / debris management*					UNEP	741,858	741,858		
B- Slope Stabilization, livelihoods & NRM					UNDP	9,572,909	4,313,343	4,637,166	622,400
subtotal Activity costs						10,314,767	5,055,201	4,637,166	622,400
7. Subtotal of Actions 1 to 6						11,859,967	5,713,601	5,150,566	995,800
8. Administration costs (GMS& ISS)									
UNDP(GMS 5%, ISS 3%)					UNDP	850,652	382,512	389,969	78,170
UNEP(7%)(refer BL with *)					UNEP	74,330	63,480	10,850	-
subtotal administration costs						924,982	445,992	400,819	78,170
9. TOTAL PROGRAM COSTS						12,784,948	6,159,593	5,551,385	1,073,970