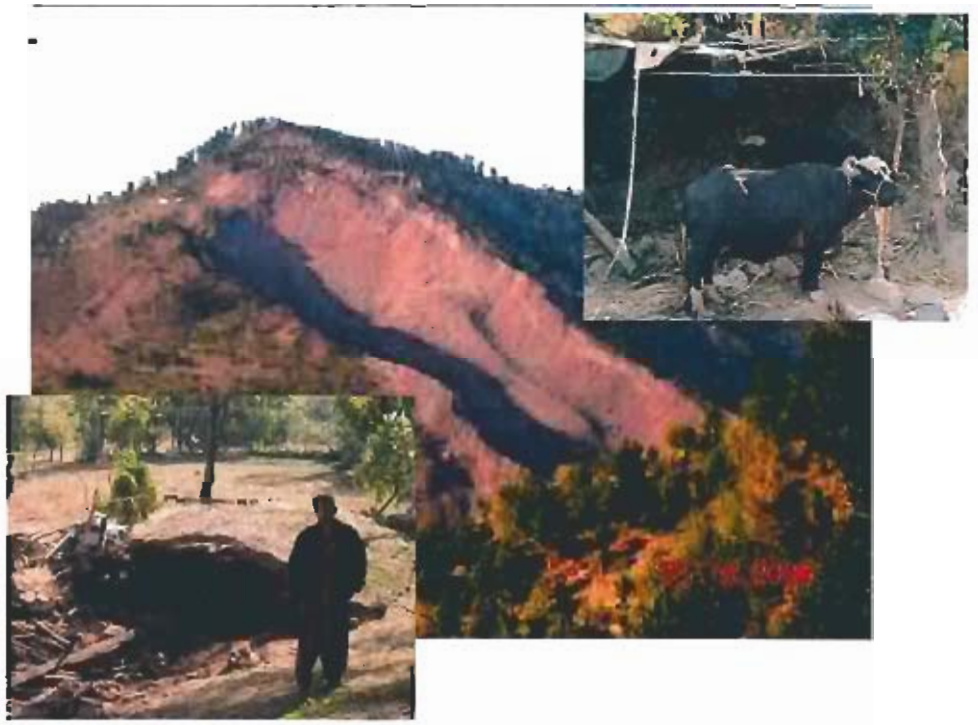
Date: 15 November 2005

PAKISTAN

POST-EARTHQUAKE EARLY RECOVERY, REHABILITATION AND RECONSTRUCTION PROGRAMME FOR THE AGRICULTURE AND LIVESTOCK SECTORS



MAIN REPORT AND ANNEXES (FROM 1 TO 8)

MINISTRY OF FOOD, AGRICULTURE AND LIVESTOCK

in collaboration with

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS – ROME

INVESTMENT CENTRE DIVISION AND EMERGENCY OPERATIONS AND REHABILITATION DIVISION

FOREWORD

The earthquake of 8th October, 2005 caused unprecedented damage in five districts of North West Frontier Province (NWFP) of Pakistan and four districts of Azad Jummu and Kashmir (AJK). A very large number of people lost their lives – the latest estimates are over 85,000 – and many more were injured. The earthquake has also caused huge economic losses. Both private and public assets were destroyed and normal production and trading activities have been disrupted.

A large part of population of the affected regions lives in rural areas with livestock, crops and agro-forestry providing a significant part of their needs of food and cash. These families have suffered tremendously. Damage to agriculture sector includes loss of standing and harvested crops, uprooting of fruit and forest tress, extermination of more than two million heads of livestock including cattle, buffalos, sheep and goats, complete elimination of poultry industry, knocking down of majority of the animal shelters, loss of stocks of food and inputs as houses and stores collapsed, destruction of irrigation infrastructure, damage to field terraces and soil conservation structures and at some places the entire fields have been lost due to landslides. Similarly, the public infrastructure related to agriculture department including office buildings, laboratories, research facilities, training and extension centers collapsed or suffered severe damage.

Ministry of Food, Agriculture and Livestock (MINFAL) responded quickly and took various actions and steps for relief operation and assessment of damage and needs in the earthquake hit areas.

The MINFAL in collaboration with Food and Agriculture Organization of the United Nations (FAO) fielded two teams comprising of local and foreign consultants and experts who started working as early as 15 October in order to compile the existing information and to carry out a rapid damage and needs assessment. The teams conducted field surveys in the earthquake hit areas and covered all the affected districts. They met with the affected people, visited their houses and fields, held discussions with local communities, civil society organizations, private sector and development partners, NGOs and Government officials to collect information with the focus to put the agriculture sector back on track for resuming economic activities. The methodology used in damage and need assessment study is according to the established international standards set for this purpose.

The findings of the field surveys were presented in a workshop convened by MINFAL in Islamabad on 10th November, 2005. The workshop was participated by all the stakeholders including Governments of AJK and NWFP, FAO, donors, development partners, farmers and NGOs. The objectives of the workshop were to jointly review the main components of the report and discuss the suggested strategic sector programme which would provide the basis for Government to prepare a coherent Post Earthquake Early Recovery Plan as well as a Rehabilitation and Reconstruction Plan for the agriculture sector. It is envisaged that such sector programmes help set a direction for rehabilitation and reconstruction and to mobilize funds from both internal and external sources to achieve the agreed targets. The report was finalized on 15th November and submitted to Government of Pakistan on the same day for inclusion in overall report of the government on damage assessment.

The earthquake affected areas were amongst the most underdeveloped and food insecure regions of the country, located in remote and difficult mountainous terrains with small landholdings and low literacy rates. The average size of landholdings is small averaging at

around 1.5 acres. Unlike other parts of Pakistan, very high proportion of farmers cultivate their own land and it is why they resisted to leave their places even in such worst circumstances and extreme weather conditions and state of food insecurity and uncertainty. Immediate economic recovery of the affected areas is, therefore, imperative for the continuity of their existence and restoring their livelihood. It can be achieved through reactivation of crop production system and providing shelters, feed and fodder to their remaining livestock for their safe survival through forth coming harsh winter season.

Immediately after the earthquake, the Ministry organized meetings of the development partners with the two affected Governments to direct and facilitate the relief work and to enhance coordination and interaction among the stakeholders. As a result, the NWFP and AJK Governments have been able to prepare an immediate plan to resort the economic cycle of the farming communities in the earthquake affected areas. The NWFP Government is helping the farmers to plant wheat on 30,000 acres and AJK Government on 15,000 acres. The inputs such as seed and fertilizers have been arranged by MINFAL directly from the producers/manufactures to the target areas so that wheat sowing could be completed latest by end of November. The cooperation of FAO and the World Bank in this regard is commendable.

The reconstruction costs for agriculture sector in NWFP and AJK has been assessed to be around US$ 560 million or Rs 34 billion covering crops, livestock and irrigation infrastructure. Since the assessment and reconstruction is an ongoing process, the cost estimates may rise in future as more information about damages pore in and needs are reassessed. This report has, however, set the base and a definite direction for planning future interventions in agriculture and livestock sectors covering the period up to 2010. The guiding principals set for rehabilitation and reconstruction programmes are to: (i) focus on poverty reduction and ensure sustainable livelihoods; (ii) give leading role to community members and organizations in reconstruction process; (iii) allow markets to lead recovery; (iv) promote environmental sustainability and (v) build back better than what was existed before.

The main elements of the proposed strategy are to promote appropriate technologies, invest in enabling and facilitating infrastructure, promote new economic activities for livelihoods diversification, rebuild a more efficient and sustainable farming system, improve livelihood and make the rural economy more resilient to future natural disasters and other shocks. Three phases have been identified for implementing the development programmes, viz., Immediate Early Recovery to be achieved within next six months followed by Short-term Rehabilitation phase ranging between 6 to 18 months and Medium to Long-term Reconstruction and Development process to last up to 5 to 10 years. These stages reflect a continuous and on-going process with clear links between the three phases.

While the emergency response phase continues, there is recognition by the President, the Prime Minister and other senior policy makers that there is a dire need to turn our attention to recovery, rehabilitation and reconstruction of the people of earthquake hit areas. People need to be helped to rebuild their lives. The challenge facing is great. The MINFAL is proactively attending the related issues and helping the both Governments to carry out the uphill task of immense urgency. It is hoped that MINFAL will be able to swiftly guide the process and the stakeholders to accomplish the set targets and goals according to the agreed time frame and priorities of the sector and the affected communities.

Sikandar Hayat Khan Bosan
Minister for Food, Agriculture and Livestock

PAKISTAN

POST-EARTHQUAKE

EARLY RECOVERY, REHABILITATION AND RECONSTRUCTION PROGRAMME FOR THE AGRICULTURE AND LIVESTOCK SECTORS

CONTENTS

ANNEXES

Currency Equivalents

(November 2005)

Local Currency	=	Pakistan Rupee (Rs.)
US$1	=	Rs. 60.00
Rs. 1.00	=	US$1.67

Abbreviations

ADB	Asian Development Bank
AJK	Azad Jammu and Kashmir
°C	Degree Celcius
cm	Centimetre
DCO	District Coordination Officer
DO	District Officer
DOA	District Officer Agriculture
DOFWMO	District On-Farm Water Management Officer
DOL	District Officer Livestock
EAD	Economic Affairs Department
EDOA	Executive District Officer Agriculture
ERRA	Earthquake Reconstruction and Rehabilitation Authority
FAO	Food and Agriculture Organization of the United Nations
ft	Feet
ha	Hectare
hh	Household
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
km	Kilometre
LOC	Line of Control
MINFAL	Ministry of Food, Agriculture and Livestock
m	Metre
masl	Metres above Sea Level
mm	Millimetre
No.	Number
NRSP	National Rural Support Programme
NWFP	North West Frontier Province
Rs.	Pakistani Rupee
Sq.ft	Square feet
SRSP	Sarhad Rural Support Programme
UC	Union Council
UN	United Nations
US$	United States Dollar
WB	World Bank

1. INTRODUCTION

1.1 On 8 October 2005, an earthquake measuring 7.6 on the Richter scale struck parts of the North West Frontier Province (NWFP) of Pakistan and Azad Jammu and Kashmir (AJK). The capital city of AJK, Muzaffarabad, and three Districts (Bagh, Muzaffarabad and Poonch) were extensively damaged. About 80-90 percent of the population in Bagh and Muzaffarabad District and about 50 percent of the population in Poonch District were affected. In NWFP, the damage was more widespread with five districts affected (Abbottabad, Battagram, Kohistan, Mansehra and Shangla). The impact varied among these districts. In Tehsil Balakot of Mansehra District almost 90 percent of the population was impacted, while in Kohistan it was less than 20 percent. In total some 3-4 million people have been affected with an estimated death toll exceeding 80,000. Over 2 million people require immediate life-saving assistance with special focus on shelter, food, water and health services.

1.2 In response to the earthquake a massive relief effort was mounted. Non-Government Organizations (NGOs) and private citizens rushed to the area to provide food, shelter and medical assistance. The Government initiated action on a wide range of fronts, providing relief goods and shelter, and clearing roads which were blocked due to landslides. The Ministry of Food, Agriculture and Livestock (MINFAL) also responded rapidly providing extra food to the Governments of AJK and NWFP, and expediting already committed supplies. At the same time MINFAL recognized the need to prepare a comprehensive damage and needs assessment which could provide the basis for planning future interventions in the agriculture and livestock sectors. In order to complement its own capacity and bring in lessons from similar assessments carried out in other countries, MINFAL requested support from the Food and Agriculture Organization of the United Nations (FAO).

1.3 An FAO team arrived in Islamabad on 14 October to start work with MINFAL and the Governments of AJK and NWFP. It was agreed that a damage and needs assessment would be prepared to cover the period up to 2010. The main purpose of the assessment would be to make an estimate of overall damages and prepare a ***Post Earthquake Early Recovery, Rehabilitation and Reconstruction Programme for the Agriculture and Livestock Sectors.*** The Programme would guide assistance by donors and by the Federal, AJK and NWFP Governments. The preparation of the assessment would involve all relevant stakeholders from the Government, local communities, civil society organizations, private sector and development partners.

1.4 Three assessment teams, including national and international experts, were formed and visited AJK and NWFP between 21 and 31 October 2005. The teams worked in close collaboration with the Governments of AJK and NWFP to compile existing information, carry out field surveys in the affected areas and interact with communities, local Government, Community-based Organizations (CBOs), NGOs, and staff working on various development projects. Various survey methods, including questionnaires and focus groups discussions, were used to estimate damages, needs and priorities. This was supplemented with a more qualitative participatory livelihoods appraisal. Based on its finding the team prepared damage and needs assessment on a district basis.

1.5 The preliminary findings of the assessment were shared with the concerned Government agencies and with development partners, including the Asian Development Bank

(ADB), the International Fund for Agricultural Development (IFAD), the World Bank (WB) and the Early Recovery and Reconstruction Cluster of the United Nations (UN). In order to validate and further refine the findings, an *Assessment Review and Planning Workshop* was held in Islamabad on 10 November 2005. The workshop brought together officials of MINFAL, the Governments of AJK and NWFP, agriculture and livestock staff working at local level, representatives from the private sector, including farmers, and development partners. The present report reflects the findings of the work done and of the consultative process carried out. The discussions and conclusions of the workshop were incorporated in the final report. Chapter 2 provides a brief background of agriculture in the affected areas, Chapter 3 provides an assessment of damages, Chapter 4 provides key principles and strategies for guiding interventions, and Chapter 5 contains Programme elements and costs. Chapter 6 discusses possible follow up actions.

1.6 While this work was being done, two other processes were underway to prepare damage and needs assessment. The World Bank and the Asian Development Bank (ADB) were requested by the Government to prepare an overall Medium and Long-term Reconstruction and Rehabilitation Programme. At the same time the United Nations started work on preparation of an Early Recovery and Reconstruction Plan. The data and findings available as a result of the FAO/MINFAL/Government of AJK and NWFP assessment were shared with the ADB, which was given the lead for the agriculture sector. The team also provided input into the Early Recovery Plan of the UN. There may be some discrepancies between the precise figures in these three assessments due to the fact that they were working to different time lines, and overall numbers were revised a number of times as new data became available and as the analysis was refined. However, the overall approaches in all three reports are fully compatible and the proposed actions are based on the same set of principles and priorities.

1.7 The assessment team would like to express its thanks to all parties concerned and hopes that this Programme will contribute to rebuilding a better future for the thousands of rural families devastated by the tragic events.

2. BACKGROUND

Overview

2.1 Azad Jammu and Kashmir and the affected areas of North West Frontier Province are located to the north-east of Pakistan. NWFP borders with Afghanistan in the north-west, while AJK's borders to the east are disputed with India and the effective frontier is the line of control (LOC) of the cease-fire line. The total population of the three affected districts in AJK (Bagh, Muzaffarabad and Poonch), which cover an area of 8 900 km^2, is 1.5 million out of which 1.1 million were affected by the earthquake. The five affected districts in NWFP (Abbottabad, Batagram, Kohistan, Mansehra and Shangla) cover 16,000 km^2 and have a population of 3.2 million of which 1.06 million have been affected. (See Annex 1, Tables 1 and 3).

2.2 In the rural areas the population mostly lives in scattered households. The average family size is about nine, but it is common to find large extended families living together in households of up to 30 people. Average live expectancy is low: 51 years for women and 52 years for men. Protein-energy, malnutrition, anaemia and iodine deficiency are widespread problems. Literacy rate varies but is generally higher in AJK. Literacy rates are lower for women than for men. In several pockets in NWFP such as Kohistan, women are predominantly illiterate. However, there is a strong demand for schooling among the population and literacy rates are rising everywhere.

Topography and Climate

2.3 The affected districts present a variation from cold mountainous areas to semi-temperate undulating areas and an altitude that varies from 650 to 1,300 masl. The mean rainfall ranges from 500 to 1,660 mm, most of the precipitation is received in the form of high intensity rains during the period June to September. The mean winter temperature is 4°C and the mean summer temperature is 32°C. The months of December, January and February are extremely cold and with heavy snowfalls in the higher altitudes.

The Rural Economy

2.4 The affected areas do not have a significant industrial base and most of the people are employed in agriculture and related service sectors. Limited income earning capacity has been a major factor pushing people to seek off-farm employment resulting in large scale out-migration both within the country and overseas. The outflow of labour and inflow of incomes had a major influence in shaping the rural economy. Migrants are usually young men who only return at certain times of the year such as land preparation. For much of the year, farms are dominated by old men, women and children. Women have substantial control over decisions and resources. Livestock activities principally rely on women who control all aspects of management and production. However, in NWFP women are restricted to only those livestock activities that are carried out indoors. Remittances provide substantial cash inflow into the area and allow many farm families to purchase food, as their needs cannot be met by their own production.

2.5 The area is geologically fragile and is increasingly subject to degradation and erosion due to a host of stress factors. There has been a very high population growth rate and despite emigration, pressure on land and natural resources is increasing. There has also been substantial uncontrolled logging in the forested area resulting in a rapid decline in the forest cover. In parts of NWFP, the large influx of Afghan refugees has exerted further pressure on the economy and the natural resources. The income level per person varies from US$150 to US$200 as compared to US$480 in the rest of the country. In AJK and NWFP, 34 percent and 43 percent respectively of the population are below the poverty line.

Agriculture in the Affected Districts

2.6 **AJK**. In the three affected districts there are 72,800 ha of cultivated land of which 6,200 ha are irrigated. The most important crop is maize with some 65,400 ha planted every year. Other important crops are wheat (23,300 ha), and fodder and vegetables (2,113 ha) (See Annex 1, Tables 1 and 2). There are 1.26 million livestock which includes some 0.25 million buffaloes, 0.40 million cattle, 0.61 million sheep and goat. The poultry population is 2.2 million.

2.7 **NWFP**. Of the total area of the five affected districts (1.7 million ha), 0.25 million ha (15.4 percent) is cultivated. From this cultivated area only 71,600 ha (28.92 percent) is irrigated. (See Annex 1, Tables 3 and 4). Out of the total uncultivated area 709,983 ha is classified as forest. Livestock population of the affected areas consist of 4.3 million cattle, 1.4 million buffaloes, 2.9 million sheep, 6.8 million goats and 0.63 million equine which produce 2.93 million tones of milk, 0.3 million tonnes of meat and 120 million eggs.

Farming Systems

2.8 The affected areas belong to the dry temperate zone with farming systems based on mixed subsistence farming including crops, livestock, horticulture and forestry activities. Most farms are owner-operated and small, with an average land holding of 1.4 ha and a cultivated area of 0.7 ha. Small-scale farmers' productivity is constrained by small fragmented holdings, harsh climatic conditions, low quality seeds, limited fertilizer use and poor pest and disease control. Farming systems in the affected Districts of AJK and NWFP are similar. Above 1,800 masl, farming is temperate and alpine, with a single crop *(kharif)* planted in March/April and harvested in October/November. In lower areas, a *rabi* crop is also planted in October/November and harvested in spring.

Crop Production

2.9 The major *kharif* crops are maize, rice, fodder and summer vegetables. During *rabi* season wheat, fodder and winter vegetables are planted. Maize is the most important crop, occupying virtually all the cultivable area in summer. The crop is grown according to traditional practices, including two shallow ploughings using draught cattle. In lower flatter areas, parts of the cultivation are carried out with the help of hired tractors. Local mixed seeds are used together with low rates of farmyard manure or fertilizer. The crop is also used for fodder. Grain yields vary from 1.4 to 2.0 tonnes/ha in irrigated areas. Wheat is of secondary importance to maize and is normally harvested for fodder in the affected temperate areas and in the sub-tropical zones for grain. Grain yields are low at about 1.0 to 1.5 tonnes/ha. Pulses are intercropped with maize for

grain and fodder. Vegetables are common, mostly karam (spinach-like leaf vegetable), turnip, radish and onions, with potatoes grown in the high altitude temperate zone. Fruit production is important in terms of food and cash crops (See Annex 1, Tables 5-9 for budgets of selected crops.)

Livestock Production

2.10 Livestock is usually one of the main assets of rural families. An average farmer may have 2-3 buffaloes and cattle, 5-8 sheep and goats and 15-20 chickens. Milk production and milk products form an essential part of the local diets; eggs and meat are sometimes sold for cash. Cattle, buffaloes, sheep and goats are kept in pens in summer but in covered rooms adjacent to, or under, the main dwelling during winter. These sheds are often made of timber with very thick and heavy walls and roofs to keep out the cold. During summer, herds of cattle and sheep and goats are taken to alpines pastures. The small ruminants are well adapted to the rugged topography and utilise even the ranges inaccessible by other livestock. Poultry is mainly kept in covered sheds and there are now a number of small to medium-scale poultry producers operating in these areas. Enterprise budgets for livestock are given in Annex 1, Tables 11 and 12.

2.11 Among livestock the buffalo holds pride of place and ownership is an aspiration of the large majority. The price of an improved Punjabi buffalo is around Rs. 50,000, less (Rs. 30,000) for the local 'desi' breed which is sometimes preferred at high altitudes since they are lighter and more mobile on steep slopes, and are considered more resilient to harsh conditions and diseases. The buffalo is cared for with great attention. Much rural activity centres on its health and welfare. There are local 'vets', who have good skills in diagnosing and curing various ailments and are highly valued. The regime for feeding and watering, and for taking them out into the fresh air, is tightly controlled, usually by women. In return, the buffalo provides milk for domestic consumption and sale, calves, and ultimately meat. In October milk yield is at its peak, and average yields can be as high as 10 to 12 litres a day for an improved Punjabi animal (5-6 litres for 'desi' animals). Priorities for use of the milk are firstly for nutrition of family – especially children. A second priority is for making tea for guests. Any remainder will be sold, and the price is currently around Rs. 25 per litre. At higher altitudes where warmth is at a premium, livestock (along with much other agricultural paraphernalia) is housed at ground floor level in a two or three storey house, with family living above.

2.12 Livestock are well integrated into the farming system. During summer and spring, most of the feeding is on range lands particularly of small ruminants. In winter dried stacked grasses and crop residues are used for stall feeding. Some farmers are now growing fodder crops and also supplement these with concentrate feed – for example to lactating buffaloes or to poultry. Bullocks are the primary source of draught/traction power, especially in the steeper and terraced lands. Buffaloes are the main source of milk production. Pregnant or lactating animals are purchased from lowland areas and are resold once the lactation is over. Small ruminants production systems include household mixed farming, sedentary production system, transhumant system and nomadic farming. In addition to small ruminants, equine (mainly donkeys and mules) are also maintained by rural smallholders mainly as a means of transportation of goods. Livestock provide a means of savings and can be sold in years of crop failures or to provide ready cash for meeting family needs.

2.13 Ensuring that sufficient stocks of animal fodder are laid in for the winter period is an enduring problem for livestock owners. They need to ensure that sufficient dried fodder and concentrate is stored. The concentrate ('khal', cottonseed cake) is imported from Punjab, as is much of the dried wheat straw ('bhusa'), and this has to be purchased in bulk. This is supplemented by whatever green fodder is available - berseem and wheat at lower altitudes. There are also tree species in the forest which are cut for mixing with other feed (especially Quercus, Melia, and Olea species).

Forestry

2.14 Some 40 percent of the total land area in the affected districts is described as forest land, but much of this is badly degraded, with indiscriminate deforestation leading to heavy soil erosion. All but one percent of this forest land is state-owned, and there is little involvement by the community. Protection is minimal or non-existent and people often make use of the forest to sustain their livelihoods. There are over 30 species which provide people with timber for construction, fuelwood, and for making tools and implements. In addition, there are many non-wood forest products widely used for a huge range of purposes including animal fodder, animal litter, resins, and fruits and berries for human consumption. Forests include many high value species such as Dudar, Blue pine, Silver Fire, and Walnut. Farmers also plant trees on their own lands – these are mainly fruit trees and some timber trees (mainly poplar). Each community owns some communal lands (shamlat). These are low productivity areas located nearby and are predominantly used for grazing.

Land Holdings

2.15 Land holdings are small and fields are fragmented with cultivation taking place on a number of small plots and terraces. Land is divided into four categories:

- *Milkiat* (private) lands for alienable individual ownership (title);
- *Shamlat* (communal) lands used by the entire village for fodder and firewood, sometimes divided between the local residents;
- *Khalsa* (state) land, which is unencroachable, but often used for grazing and firewood; and
- Demarcated forests and state-owned pasture land (mainly in higher elevations). Seasonal grazing is allowed by the department by charging a nominal grazing fee.

2.16 A comparatively small number of households are without agricultural land, and a significant proportion of these are female headed. However, these households have sufficient space to shelter and raise livestock, and usually have some vegetables and fruit in kitchen gardens. These households rely on sales of items produced or gathered, including forest products (milk, eggs, livestock, vegetables, firewood). They also have access to common lands or 'shamlat'.

Non-Farm Income

2.17 Some few households are well-off, but these typically have livelihoods enhanced by a number of possible external sources of income. Around 20 percent of the best-off families receive remittances from members working overseas, sometimes in OPEC countries. A large percentage – around 40 percent – have family members who are employed locally or in Pakistan – many in this region have a son in the army, and some have a family member in government. Others have family members working in service industries in Islamabad, Rawalpindi and beyond. The remaining 40 percent of households rely entirely on farm and off-farm activities, and many of these also sell their labour either locally to larger farmers, or if they live near to a town, into the urban employment market. A lack of employment opportunities is cited as one of the key problems facing those needing to supplement their livelihoods.

2.18 In terms of livelihood diversification, there are few income generating activities in evidence in rural areas, and in particular women lack the opportunity, know-how and resources to diversify their livelihoods. Low levels of female education aggravate this. The most often mentioned possibilities, with some examples of good practice, are bee-keeping, sericulture, fruit and vegetable preservation and marketing, expansion of existing livestock and poultry production, and kitchen gardening/vegetable marketing. People cite a lack of available credit as being a main constraint to diversifying their income and developing a new enterprise.

Institutional Arrangements

2.19 **AJK**. Overall responsibility for agriculture, livestock and forestry are vested with the Secretary of Agriculture, Animal Husbandry and Forestry. Other relevant agencies include the Planning and Development Department (P&D), which has the task of coordinating, monitoring and evaluating the activities of the line agencies; and the Department of Industries, which among its other activities, covers sericulture development and operates a number of Vocational Training Centres. The Agricultural University at Rawlakot imparts agricultural education. AJK had a prestigious extension services management academy prior to earthquake. Alkhair University offers multidisciplinary programmes. There are agriculture and livestock staff at District, Tehsil and Union Council level. At District and Tehsil level there are Agriculture Officers and Veterinary Officers who are graduates. At Union Council levels there are Field Assistants and Livestock Assistants who are diploma holders.

2.20 **NWFP**. In NWFP, the there are separate Departments of Agriculture, of Livestock and of Forestry each headed by a Secretary. The agency responsible for coordination, monitoring and evaluation is the Provincial Planning and Development Department. The NWFP Agricultural University conducts degree level programmes in agricultural and livestock. There are adequate arrangements for training of support staff. The extension services are provided by the Agriculture and Livestock and Dairy Development Departments with a vaccine production unit at the provincial capital. At the District, Tehsil and Union Council level the extension and animal health services activities are performed by staff similar to those in AJK.

3. DAMAGE ASSESSMENT

Overview

3.1 The earthquake caused an unprecedented number of deaths. No kind of housing escaped, and in worst affected areas human dwellings have been entirely destroyed. Local *kacha* houses with massive earth roofs fared worse. These buildings are characterised by extremely heavy roofs, formed from massive support timbers covered with two to three feet of earth. These structures, whilst providing excellent insulation against cold and snow, proved totally inadequate in withstanding seismic shock, and collapsed within seconds of the onset of the earthquake, crushing anything beneath it, animate or inanimate alike. At higher altitudes the better-off live often in two- or three-storey farmhouses - the ground floor is for animals, the first for family, and the third for guests. These more modern 'pacca' houses are built with stone or reinforced concrete and galvanised sheet roofs. They also collapsed, but relatively with less loss of life. Many survivors are injured, often seriously, and may remain handicapped. Longer term psychological trauma is likely, especially among the young. The earthquake also caused a dramatic depletion in the assets that were available for generating livelihoods in affected areas and has disrupted normal production systems. Agriculture and livestock activities have been hard hit and with most people living in rural areas, this has had a very large impact on livelihoods.

Damage and Losses in the Crops Subsector

3.2 The earthquake caused damage to standing crops of maize, rice and fodder which could not be harvested; to stocks of food and inputs which were buried under collapsed houses; and to fruit and other trees. Damage was also caused to irrigation infrastructure and to terraces and fields due to landslides. Lastly, due to the disruption caused by the earthquake, *rabi* crops such as wheat and fodder, could not be planted. Damage in the crops subsector are summarised in the table below:

	Direct Damages	Indirect Losses
Crops	• Damage to standing crops. • Loss of food and input stocks. • Damage/loss of terraces and fields. • Damage to trees.	• Inability to plant *rabi* crops.
Infrastructure	• Damage to irrigation facilities • Damage/loss of terraces and fields.	• Reduced irrigation capacity for cropping. • Reduced land for crops.
Other Crop Related Damages	• Damage/collapse of agricultural extension and research buildings. • Loss of farm equipment and machinery.	• Reduced capacity to cultivate. • Lower yields and labour productivity.

3.3 **Damage to Standing Crops.** Maize is the main cereal crop in the area. Farmers were already expecting a reduction in maize harvest due to low rainfall intensity during the current *kharif* season. Harvesting was underway when the earthquake struck. That part of the crop which was already harvested has been buried under collapsed houses or stores, or has rotted if left unattended in the fields. Standing crops of maize have been mostly destroyed since owners were unable to harvest – it has therefore rotted or been eaten by untethered stock. Rice harvest was also underway and due to the earthquake, the harvest has not been completed. This has led to shattering and grain loss which will increase with time. Similarly, in the cases of grasses which are used for fodder during the winter. Grass cutting from farm and rangelands was underway but has been abandoned. As a result a part will be lost due to not being harvested, and another part will be lost as has been cut but not properly stacked. Estimated losses of crops in the affected areas range from 30 to 75 percent. Estimates for damage to different crops are given in Annex 2 (AJK) and Annex 3 (NWFP), Table 1.

3.4 **Losses Due to Disruption to the Rabi Crop.** Stocks of seeds for the upcoming Rabi season have been lost due to collapse of houses and stores. These include seeds for wheat and winter vegetables such as turnips, onions, radish and cabbage, which were to be planted in the coming weeks. If not buried under debris, existing stocks have started to rot due to subsequent rains. Wheat is the main crop planted in the Rabi season, and the last planting date is the end of November. At lower altitudes, where tractors are available for cultivation, there are already signs that cropping is underway, however, higher up the capacity to get a crop into the ground is much reduced, and it is unlikely that there will be much planting at all. Although berseem and other green fodder crops have already been planted at lower altitudes, this is not the case higher up the slopes.

3.5 **Other Damages and Losses**. Most households have fruit trees, with a high proportion of soft fruits at lower altitudes. Much of the fruit already harvested was destroyed. In some cases the trees have been destroyed due to landslides or cracks in the soils. Some damage has also been done to the fodder and timber trees planted on farm lands. In NWFP and AJK many tractors which are used on flatter land have been lost or damaged, including those hired into AJK on a rental basis from tractors owners in Mansehra District of NWFP.

Damages to Irrigation and Other Infrastructure

3.6 The affected area has large infrastructure in terms of field bunds and terraces for rainwater harvesting and channels for irrigation, which have been damaged. In some cases deep cracks have formed which have caused splitting across terrace retaining walls. Cracks appear to run deep into the subsoil. At the onset of rains and heavy winter weather there is a strong likelihood of further landslides which will hinder farm activities and block access. In places, terraces and retaining walls have often fallen and collapsed, frequently over long stretches. Land slippage has caused shifting of entire ledges of soil, in effect creating entirely new terraces. The slope of the land has in some cases changed, giving rise to new slopes that on irrigated lands will require re-grading. Water distribution systems will have to be completely re-aligned in many places. Increasingly, terraces are being used to erect tents and other temporary shelters, further depleting the area available for immediate cultivation. Many natural springs have dried up which will create problems not only for crops but also impacting drinking water supplies for both humans and animals.

3.7 On-farm structures such as terraces/bunds (5 percent), irrigation diversions (50 percent), water channels/canals (50 percent), water lifting devices (25 percent) and water spillways (up to 100 percent) have been severely damaged in AJK. In NWFP, it is estimated that 50 to 60 percent of the irrigation structures have been damaged. In some of the hardest hit areas of AJK and NWFP, entire fields have been lost due to slides (See Annex 2 and 3, Table 3.)

3.8 Landslides have reduced tree-cover, and thereby contributed to increased soil instability and erosion. Further depletion of the already scarce forest resources can be expected, as stocks of wood for fuel and rebuilding will be built up before the onset of winter.

Damage and Losses in the Livestock Subsector

3.9 Livestock keeping is one of the key activities in the areas. It is one of the main forms in which assets are held and provides the bulk of the value of output at farm level (over 75 percent in most Districts – see Annexes 2 and 3, Table 10). The earthquake caused a huge number of casualties among livestock. Animals mainly died as buildings in which they were housed collapsed on them but in some cases they were hit by landslides or rocks. Surviving animals, particularly lactating buffaloes, are likely to face large reduction in yields due to lack of feed and shelter – buffaloes are subtropical animals and the cold substantially reduces milk production. The damages and losses in the livestock subsector can be categorized as follows:

Direct Damages	Indirect Losses
• Animal mortality. • Damage/collapse of animal sheds. • Loss of stocks of feed, fodder and inputs. • Livestock and dairy development buildings damages/losses.	• Animal productivity losses.

3.10 **Livestock Mortality and Losses.** There has been a heavy toll on livestock. Livestock are usually kept in sheds or rooms alongside or underneath human dwellings. Animal housing are made of stone, timber and a thick layer of earth on top (sometimes up to 30-50 cm thick) to keep out the cold. During the earthquake these building collapsed. The fall of the heavy roof on top of the animal caused high mortality (up to 100 percent in the worst affected areas). There are variations in mortality figures, depending on the extent to which animals were moved outside the sheds before the earthquake that morning. This depended largely on altitude and associated temperatures. At higher altitudes most animals were inside, where a typical regime in October requires taking them outside from around 10 am to 3 pm. In lower altitudes losses were less as animals are moved outside from 9 am to 5 pm. During the summer some livestock, particularly sheep and goats are taken to alpine pastures. Many of these herds of sheep and goats were on their way back from pastures when the earthquake struck. These comprised stock owned by local people, as well as large flocks belonging to transhumants (Gujars). The land and rock slides caused by the earthquake resulted in a large number of deaths and injuries among these people and their livestock. A reduction in livestock numbers continues as animals abandoned by affected families are dying or are being sold or slaughtered in anticipation of the harsh winter and a lack of fodder and housing.

3.11 **Feed and Fodder Stocks.** Normal over winter fodder is comprised of soaked concentrate (khal, cottonseed cake) mixed with chopped wheat straw (bhusa). Both are imported from Punjab and stored. The earthquake struck at peak time for cutting local grass for hay, which is stored in stacks and tree-shelters. These stocks have been damaged by the heavy rains following the days after the earthquake. At the same time most of the feed and fodder stocks stored in houses have been buried under debris. Affected households still have access to roughage from maize stalk and range grasses harvested during and after the earthquake devastation, grazing will still be available in places for cattle on shamlat areas (village common lands), and there may be fodder supplements from certain tree species. However, overall there will be a sharp fall in feed and fodder availability, which is resulting in distress selling – sometimes at prices which are 30-50% of their normal levels.

Impact on Support Services

3.12 Agriculture support facilities such as research centres, laboratories, training centres and extension centres have collapsed or suffered severe damage. Animal health facilities (veterinary stations and clinics) have been damaged. Stocks of medicines and other stores have also been destroyed due to collapse of structures as well as the electricity cut which lasted for several days after the earthquake.

Impact on Social Capital and Cohesion

3.13 Traditional systems of mutual help and social cohesions are under threat after the earthquake. Although the affected community are used to hardship and there is a high level of traditional resilience, this situation is unprecedented in living memory, and very few will have the capacity to manage without support from outside. This has affected all sectors of society but the poorest and most marginalised groups have been the worst hit. Social capital and community cohesion is threatened by migration. The survival of the most vulnerable groups has been further compromised as a result of a diminution of the support of better-off members of the community who have been equally affected by the earthquake. Specific targeted interventions will be required to protect them over the coming months.

3.14 In most places, some 20-30 percent of the better-off members of society have already migrated to lower areas and another 50 percent are currently seriously considering it. The group of most concern is the remaining 20-30 percent, which is too poor to move and anyway has nowhere to go. This group is highly vulnerable, has no resources, and will rely on help from the community for protection and to enable it to survive (often female-headed households, newly widowed among these, and the landless). Migration weakens the social fabric and will seriously reduce the capacity of the poorest and most vulnerable groups to survive. In order not to disrupt the social structures further, all efforts should be made to enable people to stay in their community through continued provision of adequate shelter, food, water supply, health care and sanitation and where possible with agriculture inputs to enable them to resume farming activities.

Loss of Savings and Capital

3.15 The capacity of rural families to rebuild their livelihoods has been compromised by an enormous loss of personal possessions. Many cash deposits held at home have not yet been recovered, buried in the ruins of people's homes, often under tons of mud or rubble. Jewellery is another very common means of saving in the rural population, and this has suffered a similar fate. Other valuable personal possessions mentioned included books, poems, papers, documents, letters, and other memorabilia. In the wreckage also lie household effects such as beds, crockery, dowry, clothing and food. Of the latter, stocks were high in anticipation of the Eid festival.

Labour and Human Capital

3.16 Human capital is made up of health and nutrition, education, local skills and knowledge, and other human elements that help to make labour productive, and these have been devastated. Public health and education services have ground to a complete halt, with huge loss of life among pupils, patients and staff, and an almost total destruction of buildings and resources in these sectors. Health and nutrition are further threatened by a diminished and unbalanced diet in particular in less easily accessible rural areas. As is the case with all people affected, artisan and skilled labour is primarily occupied with coping with its own domestic problems. In addition many skilled and unskilled workers have already migrated to areas where there is easier work with more readily available money. Both the rural and urban labour markets are further weakened through a lack of cash and capacity to remunerate. Many tools, equipment and small machinery that are needed for productive work have been buried and destroyed.

Some Affected Households

Mohammed Akbar lives in a village at high altitude - around 6,000 feet - between Muzaffarabad and Bagh, in one of the worst affected areas. This village is normally cut off for two months of the year by snowfall. The surrounding landscape is one of wreckage and destruction, with no house left standing. His sister and a daughter were killed in the earthquake, both being inside his house when it collapsed. His was a typical three-story 'pacca' house, with animals kept on the ground floor. The house has collapsed like a pack of cards, and under the wreckage of timbers, earth and galvanised iron sheets his entire livestock assets were killed – two buffalos and three cows. All of the usual agricultural paraphernalia was on that floor with them. The family are living in makeshift tents and sheds, and the only drinking water comes now from a spring about a kilometre away. He owns about 1.5 acres of land. The terraces where he would normally now be planting wheat are hugely cracked and uneven, and it is hard to see how he will replant this season – it would require a lot of work and he does not feel he has the energy right now. Seeds for this Rabi season are anyway lost in the ruins, as are tools and implements. Terrace walls have in places collapsed, and taken some apple trees with them. The family wants desperately to stay put, but they recognise the difficulties that they face with imminent snows, and the certainty that they will be cut off by these as usual. Food stocks laid in for Eid were destroyed, and are wholly insufficient now for winter. Temporary shelter is wholly inadequate to deal with five feet of snow. They don't know how they will cope over the coming winter.

Muhammad Aslam lives in Patseri village, Balakot (Manshera District). The family, which was relatively well-off, planted maize and rice for home consumption. They had two buffaloes, three cows and four calves. Milk from these animals was used at home and also sold for cash. Their house collapsed during the earthquake and he has lost three members of his family and two other are seriously injured. They also lost all their animals. Some of the maize crop had been harvested and the cobs were on the roof of their house for drying. These are mixed in the debris and cannot be used. The remaining maize was still in the field and the rice crops could not be harvested because of the lack of labour. There has been a shattering of rice crop due to the delay in harvest. Furthermore, both these standing crops were severely damaged by unattended roaming livestock either owned by the people of the village or nomads who were on their way back from alpine pastures to plains down the country. Aslam would have preferred to stay on the land and start reconstruction of his house. However, due to lack of any food or assets the family has shifted to a camp and the injured persons are lying in hospitals.

Arshad Begum was widowed some 10 years ago, and is around 70 years old. Her niece helps her around since she doesn't see so well these days. She comes from a village that lies at around 4,000 feet, and which was very badly affected by the earthquake. She had her own 'kacha' house which collapsed totally, and amazingly the only person hurt was her son who sustained a head injury. All her livestock were inside the house and were killed – a Punjabi cow and bull, and two calves. She is landless, and made her living from sales of small produce from her holding and from the forest – mainly from the milk, but also the odd chicken, and fuelwood. Her son, when he has recovered, also earns money selling his labour in the area. She now faces a new threat. A massive landslide that wiped out two villages in its path, with a loss of life of around 1,500 people, has blocked the local *nulla*, and made a huge new earth dam. Water levels are rising fast, and her village lies within the new catchment area, and is likely to be under water before long. No amount of machinery could shift this earth, and migration for the entire village will probably be necessary. Her immediate livelihood priorities are food and shelter for the family. She has no idea how long it will take for the lake to fill, or where they will all be in a few weeks time.

Sadiq Shah is an Agriculture Officer in Allai Tehsil of Battagram District one of the hardest hit areas in NWFP. He told of how the earthquake has disrupted the livelihoods and normal economic activity of the area. A typical example was a family in Rashing Union Council where two children died and three women were injured due to the collapse of the house. Their family income was dependent on sale of milk and livestock, and remittances from two relatives working in Karachi. The family owned three buffaloes, four cows and ten goats. Due to collapse of the animal shed all the three buffaloes died and two of the cows were seriously injured. The surviving animals could not be looked after as the family had to attend to the injured in hospitals, or go to the camps to find shelter and food. These animals can no longer be traced. They have died, escaped or been taken away. He told that in Rashing there has been no drinking water for livestock for the last eight days. The two persons who were working in Karachi are now back and living with their remaining family members in camps or hospital.

The majority of the families in the Union Council face the same situation having lost family members, livestock, crops and even cultivated lands due to land slides. He stressed that people need help as early as possible to return to their lands and start rebuilding their livelihoods.

Mohammed Munir has tragically lost almost everything. He is 35 years old, and lives in a village above Muzaffarabad that looks down on it, at some 4,000 feet masl. That morning his wife and daughter were out on the steep hillsides with other women from the village, cutting grass for hay. There was a landslide under them and they all fell. Their bodies have not been recovered. His house and livestock shelter are unrecognisable as such, having slid down the hill, totally wrecked. He also lost two buffalos in this slide, a cow and some goats. The family is landless. They made most of their income from sales of milk - this was mainly his wife's and daughter's work. He himself was a local tailor, but his small shop and his sowing machine are completely destroyed. He has lost all his savings, has no income, and little hope for the future at this point. He is just living from moment to moment right now, trying to cope with his loss. The family and friends are helping out.

Vulnerability Factors

3.17 This area is prone to earthquake activity, lying in a belt where the likelihood of shocks is high. Soils are loose and unstable. This instability was further exacerbated by a high level of deforestation on unprotected bare slopes, a major contributory factor in the damage caused by landslides following the earthquake. Kacha houses are built with massive timber and earth roofs - resources which are locally and cheaply available. Nobody realised how dangerous the houses were, particularly since the last serious earthquake (in 1906) was not in living memory. Households at high altitudes are more vulnerable than those lower down the slopes. This is as a result of a number of contributory factors, among them food insecurity, poor access with complete inaccessibility in winter, marginal soils, heavy winter snowfall and cold temperatures. The most vulnerable are the poor, and this group is made up in the main by female headed households. Of these the poorest are landless. The ranks of the poor and vulnerable has been swelled by the deaths resulting from the earthquake, and the most recently widowed are especially at risk. Disability, including that caused from recent injury, is an additional cause of susceptibility.

3.18 There have been a series of strong aftershocks in the period since the earthquake. A number of people in main towns have been killed in these, and the level of risk from dangerous structures in towns and rural areas alike is still very high. People are now reluctant to go inside buildings which have been damaged, and are unwilling to start to rebuild anything in case further shocks destroy their efforts. In addition to this, there is also a very high level of risk in rural areas from further landslides caused by destabilised soils and slopes.

Quantification of Damages

3.19 In order to assess overall damages, three assessment teams, including national and international experts, were formed. Two teams comprised technical experts and economists, and these made field level visits to all affected districts in order to carry out a rapid damage and needs assessment with the assistance of the local communities. Another team carried out a more qualitative participatory appraisal with a focus on rural livelihoods. Based on their findings the teams prepared damage assessments on a district basis. The preliminary findings were shared with concerned Government officials for validation prior to aggregation. The overall aggregated results for AJK and NWFP were discussed at Assessment Review and Planning Workshop held in Islamabad on 10 November 2005. Over 80 people, mainly from the affected districts and including a number of farmers, attended.

Methodology

3.20 The damage assessment was accomplished through a close consultative process involving local officials, Community Organizations, interest groups and farmers in the affected communities. Focus groups interviews, as well as questionnaires, were used to collect information (see Annex 2, Appendix 1). The district officials were consulted to classify affected areas in terms of severity of damages and visits were made to selected Union Councils and villages in these areas. Visits were made to five to six locations in each district and discussions were undertaken to estimate direct damages to the farming system (animals, animal sheds, trees and standing crops) and impact on infrastructure (including irrigation systems, terraces and land). There were also discussions about likely indirect losses due to reduced milk productivity and inability to plant the forthcoming *rabi* crops (wheat and vegetables). Estimates of damages to the agricultural research, extension and training offices were obtained from the concerned local officials. Estimates were compiled and spot visits made to animal shelter and fields. In addition, communities were asked about their immediate, short- and medium-term priority needs. The male and female sections of the affected communities were consulted separately. The data gathered from resource persons and affected communities were analyzed and damages were aggregated at district, provincial and state levels.

Results of the Damage Assessment

3.21 The results of the assessment on a District by District basis are given in Annex 2 for AJK and in Annex 3 for NWFP, along with quantities, unit prices and values. The results show an overall damage in both areas of some Rs. 16.7 billion (US$279) in AJK and Rs. 7.8 billion (US$130 million) in NWFP.

Estimates of Damages and Losses in AJK and NWFP

	Direct Damages	Indirect Losses	Total Losses	Direct Damages	Indirect Losses	Total Losses
	Rs. Billion			US$ Million		
AJK						
Livestock	8.3	3.6	11.9	137.7	60.0	197.7
Crop	4.3	0.3	4.6	72.1	5.0	77.1
Irrigation	0.2	0.0	0.2	4.0	-	4.0
Total	**12.8**	**3.9**	**16.7**	**213.8**	**65.0**	**278.8**
NWFP						
Livestock	3.9	2.4	6.3	64.7	39.5	104.2
Crop	1.3	0.2	1.5	21.7	3.0	24.7
Irrigation	0.1	0.0	0.1	1.3	-	1.3
Total	**5.3**	**2.6**	**7.8**	**87.6**	**42.5**	**130.2**
AJK+NWFP						
Livestock	12.1	6.0	18.1	202.4	99.5	301.9
Crop	5.6	0.5	6.1	93.8	8.1	101.8
Irrigation	0.3	0.0	0.3	5.3	-	5.3
Total	**18.1**	**6.5**	**24.5**	**301.4**	**107.6**	**409.0**

4. KEY GUIDING PRINCIPLES AND STRATEGIES

4.1 Rehabilitation and reconstruction efforts should not only restore production systems that existed prior to the disaster, but also rebuild a more efficient and sustainable system, in order to improve livelihoods and make the farming system more resilient to future natural disasters and other shocks. The changes need to be in-line with the specific natural resource endowment of the areas and the aspirations of the survivors who have had their lives shattered.

A Vision for the Future

4.2 The affected areas of AJK and NWFP are endowed with ago-climatic conditions which makes is suitable for a range of high value crop and livestock products. These include a variety of vegetables and fruits, which can be harvested later than in other areas of Punjab, NWFP and Balochistan; vegetable seeds, including seed potato, especially in the more remote valleys where pest and disease are easier to control; and poultry, sheep and goats. This would require a greater level of commercialization and market-driven decision making; an improved system of transport and water management; and strengthened support and regulatory systems.

Guiding Principles

4.3 The guiding principles set out below reflect the overall rehabilitation and reconstruction principles set out by the President and the Prime Minister as well as the as experience in Pakistan and other countries in the region regarding agricultural reconstruction and rehabilitation after a natural disaster. The guiding principles are:

- **Focus on Poverty Reduction and Sustainable Livelihoods**. The rehabilitation and reconstruction efforts must contribute towards an equitable rural society and ensure adequate access to natural resources and assets, particularly land and capital. There will be a need to ensure that vulnerable groups, such as the poorer members, widows and orphans are not deprived of their rights and can participate in income generating activities. This would also entail closer public-private partnerships in new agricultural investments that should be undertaken to stimulate the local economy and create employment.

- **Create a Leading Role for Local People and Their Organizations**. Rural communities should play a central role in planning and shaping their future livelihoods. Communities and groups/households need to be empowered so they can discuss options for rehabilitation and reconstruction, as well as demand accountability from those handling public resources. Wherever technically and economically feasible, their preferred options should be recognised. While the immediate recovery phase may require extensive involvement of the central and provincial government, responsibility for planning and implementing the rehabilitation and longer term reconstruction efforts should be handed over as quickly as possible to the communities, and the district governments. Cash-for-work programmes should not only apply to the rehabilitation of public infrastructure, but should also target those people who prefer to restart their own economic activities immediately.

- **Allow Markets to Lead Recovery.** Markets must be left to play a key role in guiding existing and renewed productive patterns. This will be essential to ensure that the reconstruction activities of the agriculture sector are: (i) built on the natural and entrepreneurial assets of the affected areas; and (ii) that they are sustainable beyond the period that special assistance is being provided.

- **Environmental Sustainability.** Both AJK and the affected areas of NWFP are environmentally fragile areas where poor land and water management can lead to rapid resource degradation. Demonstration of the importance and enforcement of regulatory guidelines on the use of land and pesticides, on logging, and on the use of water and the disposal of wastes and effluent, are needed. Given the widespread destruction that has occurred, the opportunity should be taken to introduce and disseminate appropriate technologies; modern land management practices; and appropriate varieties of trees, crops and livestock.

- **Build on Past and On-Going Projects and Programmes.** The affected areas of AJK and NWFP have benefited from a long series of project and programme interventions stretching over 20 years and supported by donors such as the ADB, IFAD, UNDP and the World Bank. The projects, most of which have taken a community based approach, have proved generally successful and have resulted in a strong network of Community Based Organizations, and good implementation capacity in the Government.

Overall Strategies

4.4 The earthquake has wiped out much of the physical assets of the affected area and severely disrupted lives and the economy. While there is an urgent need to restart the economy and rebuild economic and social relationships, there must be a clear-cut and deliberate attempt not to recreate poverty and unsustainable livelihoods. Key strategic actions that will be instrumental to this are:

- to empower communities and community-based organizations to take a leading role in the planning, implementation and management of the activities supported through the programme;

- to restart the rural economy by helping production to recover and markets to start functioning;

- to introduce appropriate technologies and extension methods;

- to invest in enabling and facilitating infrastructure;

- to create support services which are efficient and responsive to the needs of the people;

- to invest in community involvement in moving into new economic activities, which are economically and financially viable, create employment opportunities and are environmentally sustainable; and

- to establish efficient and transparent regulatory mechanisms.

4.5 **Recovery of Farm Production Systems**. The earthquake has severely damaged or destroyed crops, soils, trees, livestock, machinery equipment and infrastructure. Highest priority should be given to help farmers and other persons reliant on agriculture (landless labourers, traders, processors and input suppliers) to restart production and trade. This should include support for quick impact activities, including clearing cultivated areas of debris and restocking of animals. The clearing of debris, and irrigation and drainage canals, could be organized by the Public Works Department with the collaboration of communities, which could be funded by cash-for-work programmes. Taking up such work by getting local people to do it will serve two purposes: (i) restoring land productivity and (ii) restoring productive capacity and dignity of victims. Seeds and fertiliser would be provided, and lost or destroyed tools, machinery and equipment, and livestock, would be replaced. However special care is needed in avoidance of donor-driven and input delivery oriented approaches. Every effort should be made to incorporate local self-help actors in seed and seedling production nurseries to meet demand requirements. Any public distribution of assets should be targeted to those most in need and done transparently with a clearly defined arbitration and dispute settlement mechanism.

4.6 **Targeting Communities, and Male and Female Vulnerable Groups/Households, most in Need**. The strategy will be to train local Government staff in rapid damage assessment and in participatory planning methods to capacitate them to identify the communities most in need of assistance, and the most urgent and longer-term reconstruction needs of the people. This will need to be gender sensitive and must recognise and cater for the special needs of landless and other vulnerable groups such as orphans and the physically handicapped. For the short-term recovery activities, first priority will be given to assisting the most devastated communities in the Districts of Muzaffarabad, Bagh, Mansehra and Battagram, which are most in need of assistance. Second priority will be given to recovering agricultural production in the less affected locations, which are presently easily accessed by donors. Such a strategy will ensure resources reach the needy and will assist displaced people to return as quickly as possible to their communities, thereby reducing their dependence on aid.

4.7 **Introduction of Appropriate New Technologies**. There is vast experience of introducing appropriate new technologies in food and estate crops, livestock, agro-forestry, on- and off-farm storage and processing, and in small-scale income generating activities. This includes such things as Integrated Pest Management, Integrated Nutrient Management, improved integrated farming systems, and in small income generating activities. The approach will be to mobilise this experience to help the affected farming families.

4.8 **Integrated and Gender Sensitive Approach to Improving Livelihoods.** The agriculture strategy will be to use an integrated, gender-based approach to livelihood improvement whereby the farming households become the focus of attention. This will require a holistic approach which will recognise all productive interests of households, which may include food crops, orchards, livestock or other income generating activities. Extension personnel will need to be trained on how to undertake such an approach, and will need to work as a team, at times with agriculture and forestry extension staff, to be able to respond to the diverse production and income generation needs of the people. Activities supported through the agriculture plan will need to be integrated with the activities supported through other sectoral plans, especially agriculture, forestry and industry.

4.9 **Rehabilitation and Improvements to Irrigation and Drainage.** In some locations simple actions are required to repair damaged irrigation and drainage structures while in others major structures have been damaged. Responsibility for repairing damage to irrigation and drainage infrastructure is divided between Public Works and DoA. Works from secondary canals and above including the main canals, headworks and drainage structures are responsibility of Public Works while tertiary canals and other smaller structures fall under the responsibility of MoA. In some areas relatively simple actions, such as clearing out of silt and minor repairs of tertiary and quaternary canals, and field level structures, is all that will be required. Farmers as contractors or as paid labour can undertake such interventions with assistance of local Government officials. Where major repair or restructuring of secondary or primary canals and structures needs to be done, or where canal and drain alignments have to be changed, the work would be undertaken by Public Works. There will be need for a coordinated approach between Public Works and MoA in carrying out such works to ensure resources are deployed effectively and land required to be irrigated or drained can be used with a minimum of delay.

4.10 **Re-Establishment of Land Ownership**. The re-establishment of land ownership records is a complex and important task that needs to be addressed. Most records held by farmers at their homes have been lost. Land registration records, held by local officials have been extensively damaged and need to be reconstructed and reorganized. With the large number of deaths, ownership and inheritance rights need to be re-established to the land, which was not formally registered. This is likely to be a delicate and complex process and extreme care will be necessary to ensure that disputes are minimised and quickly settled, and that the rights of vulnerable groups, particularly orphans, widows and female-headed households, are safeguarded. The strategy will be to form District level committees and undertake extensive consultations and undertake participatory land and asset ownership mapping to help ensure that ownership rights are protected. The process will be helped by the fact that many of the boundary markers, even in the badly affected areas, are still recognised by local people.

4.11 **Improvement of Support Services**. Private and public support services will be essential for farming families to resume their activities. They will be instrumental in introducing new technologies and income generating activities, in promoting market linkages and helping to diversify production, and to provide rural financial services so that the activities become sustainable. Some services will need to be provided by the public sector, such as vaccination against epidemic disease and disease surveillance and general extension support, while others are best provided through public-private partnerships with farmers' associations, traders, input suppliers and credit institutions. Training of local people to perform certain services such as vaccinating livestock and animal disease surveillance, where services have been disrupted due to death and dislocation, should be pursued.

4.12 **Supporting Community and Farmers' Organizations**. Community and Farmers' Organizations (both male and female) will play a central role in the recovery process. The planning and implementation of key activities must be done in close collaboration with them. They need to play a critical role in the identification of target groups and their needs, in the distribution of inputs, and in monitoring of the assistance activities to ensure equitability and transparency. As far as possible they should be used to channel funds in-kind or cash, for example for carrying out work on their own farms or for clearing irrigation and drainage channels.

4.13 **Recovery of the Local Economy and Employment Creation**. New investment opportunities, possibly through public-private partnership, in such things as broiler chicken production, could be considered but these would be subject to technical, economic and financial feasibility assessment and would need to have donor support.

4.14 The proposed strategy will facilitate a demand-driven rapid recovery and sustainable revitalisation of the agriculture sector. Some of the activities, such as the clearing of debris and the desilting of irrigation and drainage channels, are expected to be implemented fast and would result in a fairly rapid rebound in production. However other activities, such as the introduction of new technologies and income generating activities are expected to take longer.

5. PROGRAMME INTERVENTIONS

Overall Programme Structure

5.1 In helping to reconstruct rural livelihoods, there is a need to work across different time frames. The following main phases have been identified: (i) immediate early recovery (up to six months); (ii) short-term rehabilitation (six to 18 months); and (iii) medium to long-term reconstruction and development (five to ten years). These stages should be a continuum, an ongoing process with clear links between early recovery, rehabilitation, and reconstruction, and development.

5.2 **Early Recovery Interventions**. These need to be started as soon as possible to reduce rural communities' vulnerability and dependency on emergency relief; and allow those who want to remain on their land to restart economic activities, conserve assets and resume some farming. Early recovery efforts also need to provide the basis for rehabilitation and reconstruction activities in the medium and long-term. In particular it is critical that actions are guided by the need to secure sustained rural livelihood; create clear roles for Government, Development Partners and local communities to work together; and do not put in place activities that will recreate poverty, unsustainable farming practices or conflicts.

5.3 **Short-Term Rehabilitation**: Measures need to be started to restore and repair physical assets (particularly livestock and infrastructure), resume production, and help markets and trade to start functioning. During this phase it is also important to focus on the rebuilding of human and social capital. Rural populations, which had left for the winter, need to return to their farms, common facilities repaired and restarted, and communities rebuilt. Some of the programmes to provide targeted support to vulnerable groups need to also begin. The process of planning for longer term reconstruction and development needs to fine tuned with emphasis on rebuilding Community Organizations as key partners for both planning and implementation.

5.4 **Reconstruction and Development** measures need to redirect production and trade patterns to fit with the comparative advantage of the areas. Major investments are needed in the reconstruction of the physical asset base – both at private and communal level. This will include support to building up livestock herds, replanting fruit orchards and timber trees, and reconstructing irrigation and other facilities. A major effort will also be needed to improve livelihoods by promoting new economic activities and local value addition.

	Early Recovery	Short-Term Rehabilitation	Medium to Long-Term Reconstruction
Time Frame	**6 months**	**6-18 months**	**Up to 5 years**
Objectives	o Help rural communities to keep livestock alive and restart production. o Create partnerships between local Government and Communities.	o Repair and restore assets. o Help communities return to farming. o Restart markets and trade. o Introduce targeted programmes for vulnerable groups. o Start programmes for livelihoods diversification.	o Reconstruct an efficient agricultural and livestock system. o Promote suitable technologies, local value addition and new economic activities in rural areas. o Provide targeted help for vulnerable groups. o Promote new economic activities and local value addition.
Success Measure	o Number of farmers remaining on the land. o Reduced need for relief.	o Restoration of production and incomes to pre-quake levels. o Reactivation of Community Organizations.	o Resumption of rural growth. o Reduction in poverty o Increased market. activities and new trade patterns.
Major Risks	o Rural communities are weakened as farmers abandon land. o Farmers destroy assets such as livestock and trees for survival.	o Unsustainable farming practices are introduced. o Poor and vulnerable not benefit from recovery and rehabilitation efforts. o Land disputes.	o Inefficient or unsustainable farming is entrenched. o Rural communities are not strengthened. o Poor and vulnerable groups are alienated from the development process.

Programme Components

5.5 The overall programme is divided into three major components, each of which spans the three programme periods described above:

5.6 **Component 1: Rebuilding Agriculture and Rural Livelihoods.** The component aims at rebuilding the rural economy by providing finance for both private farmers and for community based infrastructure and activities. Under this component funds would also be provided for targeted support for vulnerable groups and for livelihoods diversification.

5.7 **Component 2: Rehabilitation and Improvement of Support Services.** This component aims at restoring essential support services, rebuilding both physical and human assets. Activities to promote new technologies would also be funded along with special initiatives to promote public-private partnerships. Finance would also be provided for rebuilding the land records which have been destroyed.

5.8 **Component 3: Coordination and Monitoring & Evaluation.** Special units would be set up in AJK and NWFP to coordinate activities in the earthquake affected areas; to report on activities completed or underway; and carry out periodic evaluations.

Component 1: Rebuilding Agriculture and Rural Livelihoods

5.9 **Recovery and Improvement of Farm Production Systems.** Direct support would be provided to farmers for rebuilding of the farming system and to restart production and trade. During the **early recovery** period this would focus on in-kind provision of assistance to keep existing livestock alive and plant a winter crop. This would require in kind provision of livestock feed, building material for animal sheds, and seeds and fertilizers for wheat and winter vegetables. During the **short-term rehabilitation** phase, support would be needed to start the build back of animal herds (through the provision of young and breeding stock, as well as concentrate feed), the resumption of the main summer crop (through provision of seed, tools, equipment, fertilizer and chemicals) and replacement of fruit and timber trees (through provision of seedling and fertilizer). During this phase, greater use would be made of the market through use of coupons which would be used to finance purchase of inputs, animals, materials and equipment. In addition, there would be funding for other quick impact activities such as the clearing of cultivated areas; and repair of irrigation and drainage channels, as well as terraces, grain stores, etc. These activities could be funded through cash-for-work. In the **medium to long-term reconstruction** phase there would be a need shift from provision of inputs to increasing the asset base particularly through improving on-farm infrastructure (irrigation, terraces, animal housing, etc), and planting fruit, fodder and timber trees. During this phase there would be an increased use of matching grants for farmers' groups and communities. Under this scheme, farmers would be asked to come up with proposals for reconstruction in groups of 15-20 and grants would be provided on a varying scale (for example 50 percent for inputs and 75 percent for infrastructure). Individual or group bases proposals for investments that would have a catalytic impact on the rural economy such as marketing, processing and storage would also be considered. The possible use of micro-credit schemes or of revolving funds for funding would also be possible, but would need to be investigated in the context of specific projects.

5.10 **Development and Support of Community-Based Activities.** Funds would be provided to community organizations for repairing, rehabilitation and reconstruction of community-owned assets and facilities. This would include community (*shamlat*) lands, community irrigation and other common infrastructure. In the **early recovery** phase, funds would be provided to communities mainly for essential repairs on irrigation and other infrastructure. This would be through the direct supply of materials such as cement, steel, and other building materials, and cash for work to cover labour requirements. In the subsequent **short-term rehabilitation** phase, Community Organizations need to be drawn further into the process. They would be provided financial support, possibly through the use of coupons, for purchase of construction materials for reconstruction of broken and damaged infrastructure, planting material and fertilizer for replanting of community lands for fodder and tree crops. During this phase, finance would also be provided for strengthening their capacities, particularly through training, to take a strong role in planning and implementation of reconstruction activities. During the **reconstruction and development** phase, funds should continue to be provided for major upgrading of community facilities, including irrigation, farm-to-market roads, and small water-driven agro-processing and electricity generating plants. Such funding would be through matching grants, which could cover up to 75 percent of total costs, with the communities required to provide the rest.

5.11 **Targeted Support to Improve Livelihoods of Vulnerable Groups.** Despite the fact that all income groups have been drastically impacted by the earthquake, special efforts will be needed to ensure that the poor and vulnerable are able to participate in the recovery and reconstruction process. The vulnerable groups include not only the marginalised sections of the population, such as the landless, but also some of the new vulnerable, particularly widows, orphans and the handicapped. Many of this group are not able to leave the affected areas as they do not have the necessary cash or family connections. In the **early recovery** phase, the main emphasis would be to provide assets and inputs that can yield some food or income without large labour requirement. These would include poultry and small ruminants, vegetable seeds. Cash handouts would also be needed to allow these households to hire labour to help carry out some of the farming activities and to repair or build livestock shelters. Proper identification of vulnerable populations is a high priority and there is a need to use both NGO and government capacity in participatory methods to identify the groups and individuals within communities who are most in need of assistance. In the **short-term rehabilitation** phase, the focus would be to help these households to conserve their livelihoods and asset base, and not be forced to move out of the rural areas. Land titles are of critical importance and funds would be made available for focused efforts to make sure that their vulnerability is not exploited. In the **reconstruction and development** phase, there is a need to help these groups build up their assets and coping strategies. This may require special schemes to provide training and financing packages to move into less labour intensive activities such as production of high value products (e.g. vegetable seeds) or into activities such as marketing and processing.

5.12 **Livelihoods Diversification.** The hilly and mountainous areas of AJK and NWFP have been largely characterized by low value subsistence agriculture. Young males from most households leave the area to work overseas or in other parts of the country. However, there are a number of commercial activities that have proved successful and clearly demonstrate that these areas have a strong comparative advantage in certain commodities including off season fruit and vegetable, vegetable seed and poultry. The programme would provide support for further diversification by funding farmers wishing to undertake new economic activities. This activity would complement the Evaluation on New Technologies that will be undertaken under the support services component (see below). These activities would start in the **short-term rehabilitation** phase with creation on a series of initiatives aimed at farmers such as provision of machinery and equipment or of small grants. However, the bulk of the work will be in the **reconstruction and development** phase where a special programme would be funded to systematically fund investments in diversification and strengthening of the market linkages.

Component 2: Rehabilitation and Improvement of Support Services

5.13 **Rehabilitation of Public Service Facilities.** Key public services in the affected areas would be rehabilitated. These include animal health and veterinary centres, laboratories, seed production facilities, nurseries and training facilities. In addition, in areas where there are public irrigation facilities damaged by the earthquake these would be repaired or rehabilitated. In the **early recovery** phase, the focus would be on continuing essential services through direct provision of inputs (vaccines and cold chains, plant propagation material for nurseries, certified foundation seed for seed farms, etc.), and on starting some repair work on irrigation facilities. In the **short-term rehabilitation** phase, public buildings and structures that are still intact would be surveyed and essential repair work funded. There is also a need to carefully assess if building completely destroyed need to be rebuilt and, if so, to what size, scale and design. In the

reconstruction and development stage, the focus would be on recreating a public support services structure that is suited to the specific needs of the area and takes account of international best practices. This would make maximum possible use of private sector service delivery capacity and of the public-private partnerships (see below). Funds would therefore be provided for completion of repair and reconstruction work, and provision of equipment and training for those support and regulatory services that need to remain in the public sector.

5.14 **Participatory Evaluation of New Technologies**. As mentioned above, the affected areas of AJK and NWFP have the potential to upgrade the production systems and undertake more commercial and high-value farming activities. The programme would undertake a process where appropriate new technologies are evaluated, tested and if successful, propagated. This work will need to start in the **short-term rehabilitation** phase with studies being funded to identify and validate the most promising new technologies for production, storage and processing, and to start some on-farm testing of these technologies. In the **recovery and development** phase, the result of pilot testing will be assessed and a programme started to upscale the successful technologies. The approach will be to exploit farmer-research-extension synergy in technology development.

5.15 **Improvement of Support Services**. Improved support services for the rural population would require innovations and improvements in the present system. The programme would therefore fund activities to build public-private partnerships to provide services, promote creation of producer and traders associations to strengthen market linkages, and make increased use of the private sector to provide services, especially rural financial services. The process needs to start in the **short-term rehabilitation** phase, with creation of mechanisms that would fund and promote such initiatives. However, the bulk of these activities would only start in the **reconstruction and development** phase.

5.16 **Re-Establishment of Land and Property Rights**. The re-establishment of land ownership records is a complex and important task that needs to be addressed. Most records held by farmers at their own homes have been lost. Land registration records held by local officials have been extensively damaged and need to be reorganized. With the large number of deaths, ownership and inheritance rights need to be re-established to the land, which was not formally registered. This is likely to be a delicate and complex process, and the rights of the most vulnerable groups will need safeguarding. This work will need to start in the **early recovery** phase with an inventory of land records that still exist. However, actual work will have to spill into the **short-term rehabilitation** and **reconstruction** phases.

Component 3: Coordination and Monitoring & Evaluation (M&E)

5.17 The programme described above is likely to be funded through a disparate series of projects supported by different agencies. There is a need for a Government role to maintain overall programme coherence, avoid duplication and monitor progress. To do this, separate Coordination and M&E Units would need to be set up for AJK and for NWFP, possibly directly under the office of the Chief Secretary. A small Unit would also be created in MINFAL to help in liaison with donors, other Government Ministries, and with the Earthquake Reconstruction and Rehabilitation Authority (ERRA). The Units would report on activities that have been undertaken, on the amounts spent, and the effectiveness and impact of the actions taken. Systems would be created as soon as possible to do this and contacts established with all development partners to agree on the frequency and format of reporting.

Programme Costs

5.18 The cost of the overall Programme, including all three phases is estimated at Rs. 33.4 billion (US$557 million). The costs are summarised below and further details are provided in Annex 4. These costs are more or less in line with those provided by the Governments of AJK and NWFP although there are some differences in structure and format. The detailed proposals from AJK and NWFP are contained in Annex 8.

Cost of Early Recovery, Rehabilitation and Reconstruction of the Agriculture and Livestock Sectors - AJK
(US$ Million)

	Early Recovery (up to 6 months)	Short-term Rehabilitation (6 to 18 months)	Reconstruction (18 m. - 5 yrs.)	Total
COMPONENT 1				
Rebuilding Agriculture and Rural Livelihoods				
Recovery and improvement of farm production systems	38.1	38.7	171.9	248.7
Development and support of community-based activities	1.0	3.2	16.2	20.4
Targeted support to improve livelihoods of vulnerable groups	3.0	5.0	15.0	23.0
Livelihoods diversification		0.3	5.0	5.3
Subtotal Component 1	**42.1**	**47.2**	**208.1**	**297.4**
COMPONENT 2				
Rehabilitation and Improvement of Support Services				
Rehabilitation of public services facilities	0.0	6.3	17.8	24.2
Participatory evaluation and promotion of new technologies	0.1	0.2	2.0	2.3
Improvement of support services	0.1	0.2	3.0	3.3
Re-establishment of land and property rights	0.1	0.2	3.0	3.3
Subtotal Component 2	**0.3**	**6.9**	**25.8**	**33.1**
COMPONENT 3				
Coordination and Monitoring and Evaluation	0.4	0.4	1.0	1.7
TOTAL	**42.7**	**54.5**	**234.9**	**332.2**

Cost of Early Recovery, Rehabilitation and Reconstruction of the Agriculture and Livestock Sectors - NWFP
(US$ Million)

	Early Recovery (Up to 6 months)	Short-Term Rehabilitation (6-18 months)	Reconstruction (18 m. - 5 yrs.)	Total
COMPONENT 1				
Rebuilding Agriculture and Rural Livelihoods				
Recovery and improvement of farm production systems	29.5	29.4	105.3	164.3
Development and support of community-based activities	1.0	2.4	15.4	18.8
Targeted support to improve livelihoods of vulnerable groups	3.0	5.0	15.0	23.0
Livelihoods diversification		0.3	5.0	5.3
Subtotal Component 1	**33.5**	**37.1**	**140.7**	**211.3**
COMPONENT 2				
Rehabilitation and Improvement of Support Services				
Rehabilitation of public services facilities	0.0	0.9	2.3	3.1
Participatory evaluation and promotion of new technologies	0.1	0.2	2.0	2.3
Improvement of support services	0.1	0.2	3.0	3.3
Re-establishment of land and property rights	0.1	0.2	3.0	3.3
Subtotal Component 2	**0.3**	**1.5**	**10.3**	12.0
COMPONENT 3				
Coordination and Monitoring and Evaluation	0.4	0.4	1.0	1.7
TOTAL:	**34.2**	**38.9**	**152.0**	**225.1**

Implementation Arrangements

5.19 The main purpose of the Programme is to allow a coordinated and coherent set of interventions. In particular, support through various sources needs to be matched against needs, and, where necessary, adjustments made to avoid duplication and address gaps. The Coordination and M&E Units described above would provide information on activities being undertaken. This would be provided to a Steering Committee Chaired by the Minister of MINFAL, and including representatives of the Governments of AJK and NWFP. Based on information, the Minister, assisted by the senior officials of MINFAL would hold discussions with EAD, donors and Ministry of Finance about allocation and use of funds.

6. FOLLOW UP

6.1 The Programme, as discussed in Chapter 5, is based on needs as expressed by the Governments of AJK and NWFP as well as local officials, Community Organizations and other stakeholders in the affected areas. The assessment provides a road map for the recovery, rehabilitation and reconstruction process and provides a set of guidelines and priorities regarding what should be done at different times. In order to move forward it is necessary to evaluate what various financing agencies and donors are doing, or are planning to do. It would be most critical that this information is provided to MINFAL, and to the Governments of AJK and NWFP in a timely manner, so that duplication and gaps can be avoided.

6.2 The additional needs of the Programme will most likely be filled by different projects funded from a variety of sources. Each of these projects will require detailed preparation in line with the requirements and formats of the donor involved. MINFAL and the concerned Governments of AJK and NWFP will coordinate this process by collaborating closely with preparation and appraisal teams.

6.3 There is a need to review progress on implementation of the Programme, making changes and amendments as required. MINFAL would therefore convene periodic workshops to share with donors and development partners how the recovery, rehabilitation and reconstruction program is going.

ANNEX 1

AGRICULTURAL AND SOCIO-ECONOMIC DATA

Table 1. Overview of Affected Districts in AJK

	District			Total
	Bagh	Muzaffarabad	Poonch	
Total District population	395000	725000	403000	1523000
Avg. no. of pers./household (hh)	8.1	8.7	10.0	8.8
No. of hh	48616	83365	40406	172387
No. of Union Councils (UCs)	40	47	33	120
No. of UCs affected	30	44	15	89
Population in affected UCs	296250	678723	183182	1129558
% of District population	75	94	45	74
Estimated no. of hh in affected UCs	36462	78043.82979	18366.36364	127854
% farm hh	93	88	97	92
No. of farm hh	45,151	73,660	39208	158,019
% farm hh affected	75	94	45	74
Estimated no. of farm hh affected	33863	68958	17822	117197
Total District area (ha)	89955	611600	188583	890138
Forest area (ha)	28322	493946	86602	608870
Cultivated area (ha)	17542	34259	21025	72826
Irrigated area (ha)	51	5990	150	6192
Unirrigated area (ha)	17490	28269	20875	66635
Avg. cultivated area/hh (ha)	0.4	0.6	0.5	0.5
Aff. cultiv. area as % of tot. cultiv. area	13156	32072	9557	54013

Table 2. Land use Statistics of the Affected Districts of AJK

	District		
	Bagh	Muzaffarabad	Poonch
	Area in ha		
Maize	16157	30301	18892
Wheat	3038	6072	14190
Rice	112	881	185
Vegetable	53	249	100
Potato	13	51	82
Fodder	894	479	192
Fruit trees (no)	381,048	504,727	321,470
Non-fruit trees (no)	1,400,000	1,460,000	1,260,000

Table 3 Overview of Affected Districts in NWFP

	District					Total
	Mansehra	Battagram	Shangla	Abbotabad	Kohastan	
Total District population	1,152,839	307278	434,563	880,666	469,053	3,244,399
Avg. no. of pers./household (hh)	6.7	6.6	8.1	6.7	15.6	9
No. of hh	172,066	46438	53,649	131,442	30,000	433,595
No. of Union Councils (UCs)	59	20	28	55	38	200
No. of UCs affected	29	15	6	7	7	64
Population in affected UCs	510,414	230,108	105,049	126,098	86,306	1,057,975
% of District population	44%	75%	24%	14%	18.4%	35
Estimated no. of hh in affected UCs	73,004	34,865	12,386	18,402	5,520	144,177
% farm hh	80%	75%	50%	70%	100%	75
No. of farm hh	58,403	27,892	6,193	12,881	5,520	110,889
% farm hh affected	90%	100%	100%	90%	100%	96
Estimated no. of farm hh affected	**52,563**	**27,892**	**6,193**	**11,593**	**5,520**	103,761
Total District area (ha)	439,423	92,997	137,442	178,401	758,116	1,606,379
Forest area (ha)	332,252	37,983	39,848	83,201	216,699	709,983
Cultivated area (ha)	80,754	24,173	42,358	63,450	36,749	247,484
Irrigated area (ha)	20,324	4,933	3,074	7,050	26,198	61,579
Unirrigated area (ha)	60,430	19,240	39,284	56,400	10,551	185,905
Avg. cultivated area/hh (ha)	0.59	0.65	1.57	0.48	1.22	1
Affected cultivated area (ha)	**30,836**	**18,129**	**9,742**	**8,883**	**6762**	74,352
Aff. cultiv. area as % of tot. cultiv. area	38%	75%	23%	14%	18.4%	34

Table 4 Land use statistics of the affected districts of NWFP

Particulars	Abbot-Abad	Battagram	Mansehra	Kohistan	Shangla
Maize	15624	18736	57843	26677	37768
Wheat	14794	7089	37677	1245	21070
Onion	-	3	48	-	-
Potato (summer)	61	-	1121	-	43
Potato (autumn)	-	-	-	-	-
Citrus	-	8	19	-	21
Apricot	6	80	23	-	22
Apple	564	25	678	-	56
Plums	43	13	185	15	19
Peaches	20	33	51	-	27
Walnut	13	10	60	68	95
Pears	3	-	39	-	22
Almond	-	2	-	-	2
Persimmon	-	-	27	-	30

ANNEX 1

Crop Models

Table 5. Maize Crop Budget

Crop: Maize (Kharif)		Irrigated			Unirrigated		
Item	Unit	Rs/unit	No. of units	Total Rs	Rs/unit	No. of units	Total Rs
Output							
Grain	ton	10,000	2.00	20,000	10,000	1.40	14,000
Thinning	ton	875	4.80	4,200	875	3.00	2,625
Stover	ton	1200	4.00	4800	1200	3.20	3840
Total gross output				**29,000**			**20,465**
Inputs							
Seeds	kg	25	30	750	25	30	750
Fertilizer							
Urea	50 kg	600	4	2,400	600	2	1,200
DAP	50 kg	1,200	2	2,400	1,200	1	1,200
FYM	ton	1,400	1	1,400			
Chemicals							
Pesticides (Furadan)	kg	100	8	800			
Herbicides							
Water charge	ha	60	1	60			
Tractor	hour	400	6	2,400	400	5	2,000
Hired labour	pers.day	150	25	3,750	150	15	2,250
Threshing	hour	400	3	1,200			
Total variable cost				**15,160**			**7,400**
Gross margin per ha				**13,840**			**13,065**
Family labour requirements	pers.day		10			9	
Gross margin per pers. day				1,384			1,452

Table 6. Wheat Crop Budget

Crop: Wheat (Rabi)		Irrigated			Unirrigated		
Item	Unit	Rs/unit	No. of units	Total Rs	Rs/unit	No. of units	Total Rs
Output							
Grain	ton	10,500	1.50	15,750	10,500	1	10,500
Straw	ton	5,000	1.30	6,500	5,000	1	5,000
Total gross output				**22,250**			**15,500**
Inputs							
Seeds	kg	25	100	2,500	15	100	1,500
Fertilizer							
Urea	50 kg	600	4	2,400	600	2	1,200
DAP	50 kg	1,200	2	2,400	1,200	1	1,200
FYM	ton	1,400	1	1,400			
Chemicals							
Pesticides							
Herbicides	L	500	2.0	1,000	500	2	1,000
Water charge	ha	50	1	50			
Tractor	hour	400	5	2,000	400	4	1,600
Hired labour	pers.day	150	15.00	2,250	150	8	1,200
Threshing & storing	hour	400	5	2,000	400		
Total variable cost				**16,000**			**7,700**
Gross margin per ha				**6,250**			**7,800**
Family labour requirements	pers.day		10			8	
Gross margin per pers. day				625			975

Crop Models (cont.)

Table 7. Rice Crop Budget

Crop: Rice (Kharif)		Irrigated		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Paddy	ton	12,500	2.60	32,500
Straw	ton	1,000	4.00	4,000
Total gross output				**36,500**
Inputs				
Nursery	ha	1500.00	1	1,500
Fertilizer				-
Urea	50 kg	600.00	4	2,400
DAP	50 kg	1,200	2	2,400
FYM	ton	1,400	1	1,400
Chemicals				
Pesticides	0	0	0	0
Herbicides	0.0	0	0	0
	0	0.0	0.0	-
Water charge	ha	160	1	160
Tractor	hour	400	6	2400
Hired labour	pers. day	150	30	4,500
Total variable cost				**14,760**
Gross margin per ha				**21,740**
Family labour requirements	pers.day		20	
Gross margin per pers. day				738

Table 8. Vegetable Crop Budget

Crop: Vegetables (Irrigated)		Kharif (Turnip, Cauliflower)			Rabi (Radish, Mustard)		
Item	Unit	Rs/unit	No. of units	Total Rs	Rs/unit	No. of units	Total Rs
Output							
Vegetables	ton	12,000	20.0	240,000	15,000	18.0	270,000
Total gross output				**240,000**			**270,000**
Inputs							
Seeds	kg	100	15	1,500	150	10	1,500
Fertilizer							
Urea	50 kg	600	6	3,600	600	6	3,600
DAP	50 kg	1,200	5	6,000	1,200	5	6,000
FYM	ton	1,400	10	40,000	1,400	10	40,000
Chemicals							
Pesticides	L	600	20	12,000	600	16	9,600
Herbicides							
Water charge	ha	80	1	80	80	1	80
Tractor	hour	400	8	3,200	400	8	3,200
Hired labour	pers. day	150	60	9,000	150	60	9,000
Total variable cost				**75,380**			**72,980**
Gross margin per ha				**164,620**			**197,020**
Family labour requirements	pers.day		50			50	
Gross margin per pers. day				3,292			3,940

Crop Models (cont.)

Table 9. Wheat as Fodder Crop Budget

	Crop:	Wheat (Fodder)		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Wheat (fodder)	t	1,500	15.0	22,500
			0.25	
Total gross output				**22,500**
Inputs				
Seeds	ha	15	100	1,500
				-
Fertilizer				-
Urea	50 kg			-
DAP	50 kg			-
FYM	0			0
Chemicals	0			0
Pesticides	0			0
Herbicides	0.0			-
Water charge	0			0
Tractor	1			-
Hired labour	pers. day	150	10	1,500
Total variable cost				**3,000**
Gross margin per ha				**19,500**
Family labour requirements			10	
Gross margin per pers. day				1950

Table 10. Grass Land Crops Budget

	Crop:	Grass (Fodder)		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Hay	t	4,000	1.5	6,000
		0.9		
Total gross output		**0.25**		**6,000**
Inputs		3.60		
Seeds	kg	1,111		
Fertilizer				
Urea	50 kg			
DAP	50 kg			
FYM				
Chemicals				
Pesticides	kg			
Herbicides	ha			
Water charge				
Tractor	ha			
Hired labour	pers. day	150	10	1,500
Total variable cost				**1,500**
Gross margin per ha				**4,500**
Family labour requirements	pers.day		10	
Gross margin per pers. day				450

ANNEX 1

Livestock Models

Table 11. Cow Enterprise Budget

	Unit	One Cow + Youngstock		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Milk	kg	20	472.50	9,450
Cull animal	head	13000	0.24	3,088
Calf	head	5,000	0.68	3,375
FYM	ton	1400	0.40	560
Total gross output				**16,473**
Inputs				
Replacement heifer	head	23000	0.25	5,750
Rabi fodder (wheat green)	ton	1500	0.36	540
Rabi fodder (dry)	ton	1200	1.20	1,440
Kharif fodder (Maize Green)	ton	875	1.92	1,680
Kharif fodder (dry)	ton	5000	0.00	0
Kharif (Grazing)	ton	0	2.88	0
CSC	kg	10	0.00	0
Wheat bran	kg	5.00	0.00	0
Maize grains	kg	10	40.00	400
Gur/Raw sugar	kg	20	2.00	40
Health treatment	lumpsum	250	1.00	250
Vaccination	lumpsum	-	0.00	0
Deworming	lumpsum	-	0.00	0
Breeding	lumpsum	200	1.00	200
Repair & maintenance shed	lumpsum	250.0	1.00	250
Total variable cost				**10,550**
Gross margin per unit				**5,923**
Family labour requirements	pers.day		28	
Gross margin per pers. day				212

Table 12. Buffalo Enterprise Budget

	Unit	One Buffalo +Youngstock		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Milk	kg	25	1,890.00	47,250
Cull animal	head	25,000	0.24	5,938
Calf	head	5,000	0.60	3,000
FYM	Tons	1,400	1.60	2,240
Total gross output				**58,428**
Inputs				
Replacement heifer	head	28,000	0.25	7,000
Rabi fodder (green)	ton	1,500	1.44	2,160
Rabi fodder (dry)	ton	1,200	1.80	2,160
Kharif fodder (Green)	ton	875	4.80	4,200
Kharif fodder (dry)	ton	5,000	2.88	14,400
Kharif (Grazing)	ton	0	0.48	0
CSC	kg	10	675.00	6,750
Wheat bran	kg	5	270.00	1,350
Maize grains	kg	10	120.00	1,200
Gur/Raw sugar	kg	20	4.00	80
Health treatment	lumpsum	1,000	1.00	1,000
Vaccination	lumpsum	0	0.00	0
Deworming	lumpsum	0	0.00	0
Breeding	lumpsum	200	1.00	200
Repair & maintenance shed	lumpsum	250	1.00	250
Total variable cost				40,750
Gross margin per unit				**17,678**
Family labour requirements	pers.day		42	
Gross margin per pers. day				421

ANNEX 1

Livestock Models (cont.)

Table 13. Sheep Enterprise Budget

	Unit	One Sheep/Goat+Lambs/Klds		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Milk	kg	20	30.00	600
Cull animal	head	2,000	0.21	425
Lamb/kids	head	2,500	1.20	3,000
FYM	ton	1,400	0.40	560
Total gross output				**4,585**
Inputs				
Replacement	head	2,000	0.25	500
Rabi fodder (green)	ton	1,500	0.00	0
Rabi fodder (dry)	ton	1,200	0.36	432
Kharif fodder (Green)	ton	875	0.00	0
Kharif fodder (dry)	ton	5,000	0.00	0
Kharif (Grazing)	ton	0	720.00	0
CSC	kg	10	0.00	0
Wheat bran	kg	5	0.00	0
Maize grains	kg	10	12.00	120
Gur/Raw sugar	kg	20	0.00	0
Health treatment	lumpsum	100	1.00	100
Vaccination	lumpsum	0	0.00	0
Deworming	lumpsum	0	0.00	0
Breeding	lumpsum	200	0.00	0
Repair & maintenance shed	lumpsum	100	1.00	100
Total variable cost				1,252
Gross margin per unit				**3,333**
Family labour requirements	pers.day		6	
Gross margin per pers. day				556

Table 14. Backyard Rural Poultry Budget

	Unit	Poultry Unit (12 birds)		
Item	Unit	Rs/unit	No. of units	Total Rs
Output				
Eggs	no.	3	600	1,800
Meat	kgs	180	9.00	1,620
Poultry Litter	Tons	2,800	0.44	1,226
Total gross output				**4,646**
Inputs				
Replacement	head	50	9.00	450
Rabi fodder (green)	ton	0	0.00	0
Rabi fodder (dry)	ton	0	0.00	0
Kharif fodder (Green)	ton	875	0.00	0
Kharif fodder (dry)	ton	5,000	0.00	0
Kharif (Grazing)	ton	0	0.00	0
CSC	kg	10	0.00	0
Wheat bran	kg	5	0.00	0
Maize grains	kg	10	219.00	2,190
Gur/Raw sugar	kg	20	0.00	0
Health treatment	lumpsum	20	1.00	20
Vaccination	lumpsum	0	0.00	0
Deworming	lumpsum	0	0.00	0
Breeding	lumpsum	0	0.00	0
Repair & maintenance shed	lumpsum	0	0.00	0
Total variable cost				2,660
Gross margin per unit				**1,986**
Family labour requirements	pers.day		6	
Gross margin per pers. day				331

ANNEX 2

ASSESSMENT OF DAMAGES AJK

Table 1 Extent of Crop Sector Damages by Districts in AJK

Sub-sectors	Bag	Muzafarabad	Poonch
Terraced area	20%	20%	5%
Fruit Trees	5%		
Multipurpose trees	2%		
Maize crop	75%		
Rice crop	30%		
Grasses	30%		
Wheat area	50%		
Research and Ext. buildings	457,749 sq ft		

Table 2 Extent of Livestock Sector Damages by Districts in AJK

Sub-sectors	Bag	Muzafarabad	Poonch
Mortality			
• Cattle	50%	21%	12%
• Buffalo	47%	29%	2%
• Sheep/goat	28%	23%	3%
Animal sheds lost	95%	95%	46%
Animal productivity	25-75%		
Livestock and Dairy Development buildings	461,700 sq ft		

Table 3 Extent of Damages to Irrigation Infrastructure in AJK

Irrigation Infrastructure	% Damages
Water Channels	50
Diversions	50
Water lifting devices	25
Water spillways	100
Water tanks	100

ANNEX 2

Table 4. Estimated Livestock Sub-sector Damages in AJK

Table 4a. Direct Livestock Losses

Total no. of animals in affected UCs	Cattle	Buffalo	Sheep	Goats	Poultry	Total
Bagh	63,492	57,918	36,873	73,180	75,000	
Muzaffarabad	214,547	79,700	107,775	185,004	549,798	
Poonch	126,983	115,837	37,745	46,359	60,000	
	405,022	253,455	182,393	304,543	684,798	
Mortality (%)						
Bagh	50	47	28	28	10	
Muzaffarabad	21	29	24	24	47	
Poonch	12	2	3	3	2	
Animal mortality (number)						
Bagh	31,746	27,221	10,324	20,490	7,500	
Muzaffarabad	45,055	23,113	25,866	44,401	258,405	
Poonch	15,238	2,317	1,132	1,391	1,200	
Total	92,039	52,651	37,323	66,282	267,105	
Cost per animal (Rs)						
Bagh	20,000	40,000	3,000	3,900	180	
Muzaffarabad	30,000	34,800	3,000	3,900	180	
Poonch	16,000	50,000	3,000	3,900	180	
Total animal mortality losses (million Rs)						
Bagh	634.9	1,088.9	31.0	79.9	1.4	1,836.0
Muzaffarabad	1,351.6	804.3	77.6	173.2	46.5	2,453.3
Poonch	243.8	115.8	3.4	5.4	0.2	368.7
Total animal mortality losses (million Rs)	**2,230.4**	**2,009.0**	**112.0**	**258.5**	**48.1**	**4657.9**
Total animal mortality losses (million US$)	**37.17**	**33.48**	**1.87**	**4.31**	**0.80**	**77.63**

Table 4b. Sheds Lost at Farm Households

	Total no. of sheds	Sheds destroyed		Cost per shed (Rs)	Total value of sheds lost	
		%	No.		(million Rs)	(million US$)
Bagh	45,151	95%	42,893	24,000	1,029.4	17.16
Muzaffarabad	73,662	95%	69,979	24,000	1,679.5	27.99
Poonch	39,207	46%	18,035	24,000	432.8	7.21
Total	**158,020**		**130,908**		**3,141.8**	**52.36**

Table 4c. Estimated Livestock Sub-sector Damages in AJK (cont.)

Damages to Livestock and Dairy Development Buildings

Livestock and Dairy Development	Dairy	Sheep & Goat	Poultry	Total
Damage to buildings (sq ft)	76,800	26,400	358,500	461,700
Cost of construction (Rs/sq. ft.)	1,000	1,000	1,000	
Total Damage Cost (million Rs)	76.8	26.4	358.5	**461.7**
Total Damage Cost (million US$)	1.28	0.44	5.98	**7.70**

	(million RS)	(million US$)
Sub-total Estimated Direct Livestock Sub-sector Damages (a+b+c)	**8,261.4**	**137.69**

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Table 5. Animal Productivity Losses

No. of animals survived	Cattle	Buffalo	Sheep	Goats	Poultry	Total
Bagh	31,746	30,697	26,549	52,690	67,500	
Muzaffarabad	169,492	56,587	81,909	140,603	291,393	
Poonch	111,745	113,520	36,613	44,968	58,800	
No. of animals in milk						
% of animals	50%	75%		25%		
Bagh	15,873	23,022		13,172		
Muzaffarabad	84,746	42,440		35,151		
Poonch	55,873	85,140		11,242		
Milk productivity loss per animal for nine months (kg)						
Bagh	225	675		120		
Muzaffarabad	225	675		120		
Poonch	225	675		120		
Damage cost (million Rs)						
Milk price per kg (Rs):	25					
Bagh	89.3	388.5		39.5		
Muzaffarabad	476.7	716.2		105.5		
Poonch	314.3	1436.7		33.7		
Total animal productivity losses (million Rs)	**880.3**	**2,541.4**		**178.7**		**3,600.4**
Total animal productivity losses (million US$)	**14.67**	**42.36**		**2.98**		**60.01**

	(million RS)	(million US$)
Sub-total Estimated Indirect Livestock Sub-sector Losses (Table 5)	**3,600.4**	**60.01**

	(million RS)	(million US$)
Total Estimated Livestock Sub-sector Losses in AJK (Table 4+5)	**11,861.8**	**197.70**

Table 6. Estimated Crop Sub-sector Damages in AJK

ANNEX 2

Table 6a. Field Terraces (Rainfed fields)	Total affected area (ha)	Total terraced area (ha)	Cost (Rs/ha)	Estimated damage (%)	Damaged terraced area (ha)	Repair cost (million Rs)
Bagh	17,307	5,192	30,000	20	1,038	31.2
Muzaffarabad	27,729	8,319	30,000	20	1,684	49.9
Poonch	20,760	6,228	30,000	5	311	9.3
Total Damage Cost (million Rs)						**90.4**
Total Damage Cost (million US$)						**1.51**

Table 6b. Land Loss (permanent)	Total affected area (ha)	Total land loss (ha)	Value of land (Rs/ha)	Total loss (million Rs)
Bagh	17,307	173	200,000	34.6
Muzaffarabad	27,729	277	200,000	55.5
Poonch	20,760	208	200,000	41.5
Total Damage Cost (million Rs)				**131.6**
Total Damage Cost (million US$)				**2.19**

Table 6c. Fruit Trees Damages	Total no. of trees	No.trees in affected areas	% loss	Trees damaged	Value (Rs/tree)	Total Loss (million Rs)
Bagh	381,048	361,996	5	18,100	5,000	90.5
Muzaffarabad	504,727	479,491	5	23,975	5,000	119.9
Poonch	321,470	147,876	2	2,958	5,000	14.8
Total fruit tree losses (million Rs)						**225.2**
Total fruit tree losses (million US$)						**3.75**

Table 6d. Multi-purpose Trees Damage (on-farm/communal land)	Total no. of trees	No.trees in affected areas	% loss	Trees damaged	Value (Rs/tree)	Total Loss (million Rs)
Bagh	1,400,000	1,330,000	2	26,600	2,000	53.2
Muzaffarabad	1,460,000	1,387,000	2	27,740	2,000	55.5
Poonch	1,260,000	579,600	2	11,592	2,000	23.2
Total multi-purpose tree losses (million Rs)						**131.9**
Total multi-purpose tree losses (million US$)						**2.20**

Table 6e. Research and Extension Building Dai	Directorate General	Dir. Ext.	Ext. Offices	Dir. Agr. Res.	Res. Stat.	Training &Adp. Res.	Total
Damage to buildings (sq ft)	33,063	5,628	349,762	14,620	22,986	31,690	457,749
Cost of damages (Rs/sq. ft.)	1,000	1,000	1,000	1,000	1,000	1,000	
Total Damage Cost (million Rs)	33.063	5.628	349.762	14.62	22.986	31.69	**457.749**
Total Damage Cost (million US$)	0.55	0.09	5.83	0.24	0.38	0.53	**7.63**

Table 6f. Storage lost at farm level (for grain, inputs, feed)						
	Total no. of hh	hh affected		Loss per hh (Rs)	Total value of loss	
		%	No.		(million RS)	(million US$)
Bagh	45,151	95%	42,893	15,000	643.4	10.72
Muzaffarabad	73,662	95%	69,979	15,000	1,049.7	17.49
Poonch	39,207	46%	18,035	15,000	270.5	4.51
Total	**158,020**		**130,908**		**1,964**	**32.73**

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Table 6g. Direct Crop Production Losses						
Area in ha	Maize grain	Maize stover	Rice paddy	Rice straw	Grasses	Total
Bagh	16,157	16,157	112	112	16,319	
Muzaffarabad	30,301	30,301	881	881	29,089	
Poonch	18,892	18,892	185	185	13,791	
Yield per ha in tons						
Bagh	1.2	1.4	3.0	4.0	1.5	
Muzaffarabad	1.2	1.4	3.0	4.0	1.5	
Poonch	1.2	1.4	3.0	4.0	1.5	
Total Yield in tons						
Bagh	19,389	22,620	336	448	24,479	
Muzaffarabad	36,352	42,422	2,644	3,526	43,634	
Poonch	22,670	26,448	555	740	20,686	
Yield Losses (%)						
Bagh	75	75	30	30	30	
Muzaffarabad	75	75	30	30	30	
Poonch	75	75	30	30	30	
Yield Losses in tons						
Bagh	14,542	16,965	101	135	7,344	
Muzaffarabad	27,271	31,817	793	1,058	13,090	
Poonch	17,002	19,836	166	222	6,206	
Prices of Production (Rs/ton)						
Bagh	10,000	2,250	15,000	1,000	5,600	
Muzaffarabad	10,000	2,250	15,000	1,000	5,600	
Poonch	10,000	2,250	15,000	1,000	5,600	
Loss in Production (Rs Million)						
Bagh	145.42	38.17	37.83	3.36	41.12	
Muzaffarabad	272.71	71.59	297.48	26.44	73.31	
Poonch	170.02	44.63	62.42	5.55	34.75	
Total crop losses (million Rs)	588.2	154.4	397.7	35.4	149.2	**1,324.8**
Total crop losses (million US$)	9.80	2.57	6.63	0.59	2.49	**22.08**

	(million RS)	(million US$)
Sub-total Estimated Direct Crop Sub-sector Damages (a+b+c+d+e+f+g)	**4,325.2**	**72.09**

ANNEX 2

Table 7. Crop Productivity Losses

Area in ha	Wheat (grain)	Wheat (straw)	Vegetables	Total
Bagh	3,038	3,038	343	
Muzaffarabad	6,702	6,702	559	
Poonch	14,190	14,190	298	
Yield per ha in tons				
Bagh	1.2	1.2	20.0	
Muzaffarabad	1.2	1.2	20.0	
Poonch	1.2	1.2	20.0	
Total Yield in tons				
Bagh	3,646	3,646	6,860	
Muzaffarabad	8,042	8,042	11,180	
Poonch	17,028	17,028	5,960	
Yield Losses (%)				
Bagh	50	50	50	
Muzaffarabad	50	50	50	
Poonch	25	25	10	
Yield Losses in tons				
Bagh	1,823	1,823	3,430	
Muzaffarabad	4,021	4,021	5,590	
Poonch	4,257	4,257	596	
Prices of Production (Rs/ton)				
Bagh	10,500	5,000	15,000	
Muzaffarabad	10,500	5,000	15,000	
Poonch	10,500	5,000	15,000	
Loss in Production (Rs Million)				
Bagh	19.14	9.11	51.45	
Muzaffarabad	42.22	20.11	83.85	
Poonch	44.70	21.29	8.94	
Total crop losses (million Rs)	106.1	50.5	144.2	**300.8**
Total crop losses (million US$)	1.77	0.84	2.40	**5.01**

	(million Rs)	(million US$)
Sub-total Estimated Indirect Crop Sub-sector Losses in AJK (Table 7)	**300.8**	**5.01**

	(million Rs)	(million US$)
Total Estimated Crop Sub-sector Losses in AJK (Table 6+7)	**4,626.0**	**77.10**

ANNEX 2

Table 8. Estimated Irrigation Sub-sector Damages in AJK

Irrigation Infrastructure	Water channels	Diversions	Water lifting devices	Water spillways	Water tanks	Total
Total number/area	350	350	200	20	40	
Cost of damage	1,000,000	250,000	125,000	250,000	250,000	
Damage (%)	50	50	25	100	100	
Total Damage Cost (million Rs)	175.0	43.8	6.3	5.0	10.0	**240.0**
Total Damage Cost (million US$)	2.92	0.73	0.10	0.08	0.17	**4.00**

	(million Rs)	(million US$)
Total Estimated Direct Damages in AJK (Table 4+6+8)	**12,826.6**	**213.78**
Total Estimated Indirect Losses in AJK (Table 5+7)	**3,901.2**	**65.0**
Total Estimated Losses in AJK	**16,727.8**	**278.8**

ANNEX 2

Table 9. Unit Costs used for Calculation of Damages/Losses (Rs)

		AJK			NWFP				
Item	Unit	Bagh	Muzaffara-bad	Poonch	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Cattle	unit	20,000	30,000	16,000	14,000	15,000	14,000	14,000	15,000
Buffalo	unit	40,000	34,800	50,000	30,000	35,000	35,000	30,000	35,000
Sheep	unit	3,000	3,000	3,000	4,000	4,000	4,000	4,000	4,000
Goats	unit	3,900	3,900	3,900	4,000	4,000	4,000	4,000	4,000
Donkey	unit				6,000	6,000	6,000	6,000	6,000
Poultry	unit	180	180	180	180	180	180	180	180
Milk	kg	25	25	25	25	25	25	25	25
Field terraces	ha	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Fruit trees	no.	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Multi-purpose trees	no.	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Land (total loss)	ha	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Maize grain	ton	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Maize stover	ton	2,250	2,250	2,250	1,200	1,200	1,200	1,200	1,200
Rice (paddy)	ton	15,000	15,000	15,000	20,000	20,000	20,000	20,000	20,000
Rice (straw)	ton	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Grasses	ton	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600
Wheat grain	ton	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Wheat straw	ton	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Vegetables	ton	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Animal shed	sq.ft	100	100	100	100	100	100	100	50
	shed	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Office buildings etc.	sq.ft.	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Storage lost	hh	15,000	15,000	15,000	10,800	5,700	4,400	10,800	25,600

Productivity Parameters used for Calculation of Losses (no. of units)

		AJK			NWFP				
Item	Unit	Bagh	Muzaffara-bad	Poonch	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Cattle in milk	%	50%	50%	50%	50%	50%	50%	50%	50%
Buffaloes in milk	%	75%	75%	75%	75%	75%	75%	75%	75%
Goats in milk	%	25%	25%	25%	20%	20%	20%	20%	20%
Milk poductivty loss/animal (9 months)									
- Cattle	kg	225	225	225	225	225	225	225	225
- Buffalo	kg	675	675	675	675	675	675	675	675
- Goat	kg	120	120	120	120	120	120	120	120
Maize grain (irrigated)	t/ha				2.0	1.4	2.2	2.1	2.3
Maize stover (irrigated)	t/ha				4.0	4.2	4.0	4.0	4.0
Maize grain (unirrigated)	t/ha	1.2	1.2	1.2	1.4	1.0	1.6	1.5	1.5
Maize stover (unirrigated)	t/ha	1.4	1.4	1.4	3.2	3.0	3.3	3.2	3.0
Rice (paddy)	t/ha	3.0	3.0	3.0	2.6	2.0	2.3	1.6	1.7
Rice (straw)	t/ha	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Grasses (hay)	t/ha	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Wheat grain (irrigated)	t/ha				1.5	1.5	1.5	1.5	1.5
Wheat straw (irrigated)	t/ha				1.3	1.3	1.3	1.3	1.3
Wheat grain (unirrigated)	t/ha	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0
Wheat straw (unirrigated)	t/ha	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0
Vegetables	t/ha	20	20	20	20	20	20	20	20

Table 10. Livelihood Analysis of AJK

	Before Quake				After Quake	
Districts	Crop Sector	Livestock Sector	Total Income	% Share of Livestock	Loss to Income (Rs)	% Loss to Income
	Household Income in Rupees					
Bagh	20166	59066	79232	75	37348	47
Muzaffarabad	21495	71429	92924	77	30614	33
Poonch	27039	121759	148798	82	21787	15

ANNEX 2

Damage Assessment for Agriculture and Livestock
Questionnaire for Rapid Assessment

A. Data at the Union Council Level

Basic Information

Total villages	
Total Population (no.)	
Total no. of farming households	
Households affected (%)	
Total cultivated area (acres)	
Total irrigated area (acres)	

District	
Tehsil	
Union Council	
Village	

Damage to Public Infrastructure

Facilities	Qty before	Percentage damage	Cost of repair (Rs)
Irrigation dykes (no.)			
Irrigation canals (km)			
Machinery (tractors), (no.)			
Farm to market roads (km)			
Local markets buildings (no.)			
Any other (sp)			
Poultry Breeding Farms+Birds (no.)			
Broiler Farms+Birds (no.)			

B. Data Collected as Averages from Focus Group Discussions (Village Level)

Basic Village Information

Total Population (no.)	
Total no. of farming households	
Households affected (%)	
Total cultivated area (acres)	
Total irrigated area (acres)	

Land Tenancy Status

Tenancy Type	% Farms
Land Owners	
Tenants	
Owner cum Tenant	

Area per Household

Average area per HH (acres)	
Irrigated area per HH (acres)	

Average Cropped Area per HH in 2004/2005

Crop	Acres cropped	Losses (%)	Value of loss (Rs)
Maize, Grain			
Maize, Stover			
Wheat Grain			
Wheat Bhusa (residues)			
Orchards (nr. of trees)			
Fruit loss			
Any other (sp)			

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Livestock / Feed per HH

	Units owned before	Losses (%)	Value of loss (Rs)
Cattle			
Buffalo			
Sheep and goats			
Donkey			
Poultry (Backyard)			
Breeding farms+birds village level			
Broiler farms+birds village level			
Fodder			
Feed			

Sources of Cash Income

Source	%
Farm	
Private business	
Employment	
Remittances	

Food Items Available from Previous Crop

Crop	Production, monds (40kg)	Quantity purchased, monds (40kg)	Surplus sold monds (40kg)
Maize			
Wheat			
Rice			

Damage to Private Infrastructure

Facilities	Qty.	Percentage damage	Cost of repair (Rs)
On-farm water channels (km)			
Field bunds/terraces (area in acres)			
Other facilities (storages, shelter) no.			

Priority Needs (for farming sector) Rank

Name	< 3 months	up to 12 months	above one year
Livestock			
Animal shelter			
Animal feed/concentrate			
Livestock health			
Seeds & Fertiliser for maize			
Seeds & Fertiliser for wheat			
Storage			
Irrigation infrastructure			
Machinery			
Market infrastructure			
Other (sp)			

ANNEX 2

C. Data at the Provincial Level

Damage to Agriculture, Extension and Forest Infrastructure

Facilities	Qty before	Percentage damage	Cost of repair (Rs)
Agriculture Extension			
Agricultural Research			
Livestock Extension			
Livestock Research			
Forest Department			

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ASSESSMENT OF DAMAGES NWFP

Table 1 Extent of Crop Sector Damages by Districts in NWFP

Sub-sectors	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Terraced area	30%				
Fruit Tree	2%				
Multipurpose tree	2%				
Maize crop	50%	50%	35%	30%	30%
Rice crop	15%	15%	10%	7%	10%
Grasses	20%				
Wheat area	30%				
Research and Ext. buildings	46150 sq ft.				

Table 2 Extent of Livestock Sector Damages by Districts in NWFP

Sub-sectors	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Mortality					
• Cattale	20%	30%	6%	20%	10%
• Buffalo	30%	40%	10%	50%	10%
• Sheep/Goat	3%	10%	10%	10%	20%
Animals Sheds Lost	25%	50%	10%	25%	50%
Animal productivity	25-75%				
Livestock and Dairy Development Dap. Buildings	63876 sq. ft.				

Table 3 Extent of Damages to Irrigation Infrastructure in NWFP

Irrigation Infrastructure	Number	Damage
Water Channels- National Program	159	50%
Water Channels-World Bank	170	50%
Total Watercourses	329	50%
Water tanks	45	50-60%

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Table 4. Estimated Livestock Sub-sector Damages in NWFP

Table 4a. Direct Livestock Losses						
Total no. of animals in affected UCs	**Cattle**	**Buffalo**	**Sheep/Goat**	**Donkey**	**Poultry**	**Total**
Mansehra	84,564	88,106	164,701	17,710	525,600	
Battagram	96,000	51,750	157,500	7,500	334,700	
Shangla	13,340	6,670	18,400	1,150	80,500	
Abbotabad	19,460	21,420	49,280	8,120	127,500	
Kohistan	37,352	7,728	263,672	11,408	110,400	
	250,716	175,674	653,553	45,888	1,178,700	
Mortality (%)						
Mansehra	20	30	3	2	2	
Battagram	30	40	10	2	2	
Shangla	6	10	10	2	2	
Abbotabad	20	50	10	5	2	
Kohistan	10	10	20	10	2	
Animal mortality (number)						
Mansehra	16,913	26,432	4,941	354	10,512	
Battagram	28,800	20,700	15,750	150	6,694	
Shangla	800	667	1,840	23	1,610	
Abbotabad	3,892	10,710	4,928	406	2,550	
Kohistan	3,735	773	52,734	1,141	2,208	
Total	**54,140**	**59,282**	**80,193**	**2,074**	**23,574**	
Cost per animal (Rs)						
Mansehra	14,000	30,000	4,000	6,000	180	
Battagram	15,000	35,000	4,000	6,000	180	
Shangla	14,000	35,000	4,000	6,000	180	
Abbotabad	14,000	30,000	4,000	6,000	180	
Kohistan	15,000	35,000	4,000	6,000	180	
Total animal mortality losses (million Rs)						
Mansehra	236.8	793.0	19.8	2.1	1.9	1,053.5
Battagram	432.0	724.5	63.0	0.9	1.2	1,221.6
Shangla	11.2	23.3	7.4	0.1	0.3	42.3
Abbotabad	54.5	321.3	19.7	2.4	0.5	398.4
Kohistan	56.0	27.0	210.9	6.8	0.4	301.3
Total animal mortality losses (million Rs)	**790.5**	**1,889.1**	**320.8**	**12.4**	**4.2**	**3017.1**
Total animal mortality losses (million US$)	**13.18**	**31.49**	**5.35**	**0.21**	**0.07**	**50.29**

Table 4b. Sheds Lost at Farm Households						
	Total no. of sheds	Sheds destroyed		Cost per shed (Rs)	Total value of sheds lost	
		%	No.		(million RS)	(million US$)
Mansehra	52,563	25%	13,141	24,000	315.4	5.26
Battagram	27,892	50%	13,946	24,000	334.7	5.58
Shangla	6,193	10%	619	24,000	14.9	0.25
Abbotabad	11,593	25%	2,898	24,000	69.6	1.16
Kohistan	5,520	50%	2,760	24,000	66.2	1.10
Total	**103,761**		**33,364**		**800.7**	**13.35**

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Table 4. Estimated Livestock Sub-sector Damages in NWFP (cont.)

Table 4c. Damages to Livestock and Dairy Development Buildings			
	Damage (sq ft)	Repair/ reconstr. cost/sq.ft (Rs)	Total cost (million Rs)
Mansehra	28,125	1,000	28.13
Battagram	27,000	1,000	27.00
Shangla	0	1,000	0
Abbotabad	8,750	1,000	8.75
Kohistan	0	1,000	0
Total Damage Cost (million Rs)			**63.88**
Total Damage Cost (million US$)			**1.1**

	(million RS)	(million US$)
Sub-total Estimated Direct Livestock Sub-sector Damages (a+b+c)	**3,881.7**	**64.70**

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Table 5. Animal Productivity Losses

No. of animals survived	Cattle	Buffalo	Sheep/ Goat	Donkey	Total
Mansehra	67,651	61,674	159,760	17,356	
Battagram	67,200	31,050	141,750	7,350	
Shangla	12,540	6,003	16,560	1,127	
Abbotabad	15,568	10,710	44,352	7,714	
Kohistan	33,617	6,955	210,938	10,267	
No. of animals in milk					
% of animals	50%	75%	20%		
Mansehra	33,826	46,256	31,952		
Battagram	33,600	23,288	28,350		
Shangla	6,270	4,502	3,312		
Abbotabad	7,784	8,033	8,870		
Kohistan	16,808	5,216	42,188		
Milk productivity loss per animal for nine months (kg)					
Mansehra	225	675	120		
Battagram	225	675	120		
Shangla	225	675	120		
Abbotabad	225	675	120		
Kohistan	225	675	120		
Damage cost (million Rs)					
Milk price per kg (Rs):	25				
Mansehra	190.3	780.6	95.9		
Battagram	189.0	393.0	85.1		
Shangla	35.3	76.0	9.9		
Abbotabad	43.8	135.5	26.6		
Kohistan	94.5	88.0	126.6		
Total animal productivity losses (million Rs)	552.9	1,473.1	344.0		2,370.0
Total animal productivity losses (million US$)	9.21	24.55	5.73		39.50

	(million RS)	(million US$)
Sub-total Estimated Indirect Livestock Sub-sector Losses (Table 5)	2,370.0	39.50

	(million RS)	(million US$)
Total Estimated Livestock Sub-sector Losses in NWFP (Table 4+5)	6,251.7	104.20

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Table 6. Estimated Crop Sub-sector Damages in NWFP

Table 6a. Field Terraces (Rainfed fields)	Total affected area (ha)	Total terraced area (ha)	Cost (Rs/ha)	Estimated damage (%)	Damaged terraced area (ha)	Repair cost (million Rs)
Mansehra	30,836	1,542	30,000	30	463	13.9
Battagram	18,129	906	30,000	30	272	8.2
Shangla	9,742	487	30,000	30	146	4.4
Abbotabad	8,883	444	30,000	30	133	4.0
Kohistan	6,762	338	30,000	30	101	3.0
Total Damage Cost (million Rs)						**33.5**
Total Damage Cost (million US$)						**0.56**

Table 6b. Land Loss (permanent)	Total affected area (ha)	Total land loss (ha)	Value of land (Rs/ha)	Total loss (million Rs)
Mansehra	30,836	308	200,000	61.7
Battagram	18,129	181	200,000	
Shangla	9,742	97	200,000	
Abbotabad	8,883	89	200,000	17.8
Kohistan	6,762	68	200,000	13.5
Total Damage Cost (million Rs)				**93.0**
Total Damage Cost (million US$)				**1.55**

Table 6c. Fruit Trees Damages	Total no. of trees	% loss	Trees damaged	Value (Rs/tree)	Total Loss (million Rs)
Mansehra	555,048	2	11,101	5,000	52.7
Battagram	326,322	2	6,526	5,000	31.0
Shangla	175,356	2	3,507	5,000	16.7
Abbotabad	159,894	2	3,198	5,000	15.2
Kohistan	121,716	2	2,434	5,000	11.6
Total fruit tree losses (million Rs)					**127.1**
Total fruit tree losses (million US$)					**2.12**

Table 6d. Multi-purpose Trees Damage (on-farm/communal land)	Total no. of trees	% loss	Trees damaged	Value (Rs/tree)	Total Loss (million Rs)
Mansehra	1,850,160	2	37,003	2,000	70.3
Battagram	1,087,740	2	21,755	2,000	41.3
Shangla	584,520	2	11,690	2,000	22.2
Abbotabad	532,980	2	10,660	2,000	20.3
Kohistan	405,720	2	8,114	2,000	15.4
Total multi-purpose tree losses (million Rs)					**169.5**
Total multi-purpose tree losses (million US$)					**2.83**

Table 6e. Damages to Agric. Extension and Research Buildings	Damage (sq ft)	Repair/ reconstr. cost/sq.ft (Rs)	Total cost (million Rs)
Mansehra	11,900	1,000	11.90
Battagram	23,000	1,000	23.00
Shangla	0	1,000	0
Abbotabad	11,250	1,000	11.25
Kohistan	0	1,000	0
Total Damage Cost (million Rs)			**46.15**
Total Damage Cost (million US$)			**0.8**

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Table 6f. Storage lost at farm level (for grain, inputs, feed)

	Total no. of hh	hh affected		Loss per hh (Rs)	Total value of loss	
		%	No.		(million RS)	(million US$)
Mansehra	52,553	25%	13,141	10,800	141.9	2.37
Battagram	27,892	50%	13,946	5,700	79.5	1.32
Shangla	6,193	10%	619	4,400	2.7	0.05
Abbotabad	11,593	25%	2,898	10,800	31.3	0.52
Kohistan	5,520	50%	2,760	25,600	70.7	1.18
Total	**103,761**		**33,364**		**326.1**	**5.43**

Table 6g. Direct Crop Production Losses

Area in ha	Non-irr.Maize grain	Non-irr. Maize stover	Irrig. Maize grain	Irrig. Maize stover	Rice paddy	Rice straw	Grasses	Total
Mansehra	20,076	20,076	2,070	2,070	855	855	17,717	
Battagram	13,710	13,710	371	371	1,916	1,916	12,673	
Shangla	8,031	8,061	382	382	290	290	6,754	
Abbotabad	1,942	1,942	80	80	7	7	1,415	
Kohistan	426	426	4,392	4,392	11	11	4,336	
Yield per ha in tons								
Mansehra	1.4	3.2	2.0	4.0	2.6	4.0	1.5	
Battagram	1.0	3.0	1.4	4.2	2.0	4.0	1.5	
Shangla	1.6	3.3	2.2	4.0	2.3	4.0	1.5	
Abbotabad	1.5	3.2	2.1	4.0	1.6	4.0	1.5	
Kohistan	1.5	3.0	2.3	4.0	1.7	4.0	1.5	
Total Yield in tons								
Mansehra	28,106	64,243	4,140	8,280	2,223	3,420	26,575	
Battagram	13,710	41,130	519	1,558	3,832	7,664	19,009	
Shangla	12,898	26,601	840	1,528	667	1,160	10,132	
Abbotabad	2,913	6,214	168	320	11	28	2,123	
Kohistan	639	1,278	10,102	17,568	19	44	6,504	
Yield Losses (%)								
Mansehra	50	50	50	50	15	15	20	
Battagram	50	50	50	50	15	15	20	
Shangla	35	35	35	35	10	10	20	
Abbotabad	30	30	30	30	7	7	20	
Kohistan	30	30	30	30	10	10	20	
Yield Losses in tons								
Mansehra	14,053	32,122	2,070	4,140	333	513	5,315	
Battagram	6,855	20,565	260	779	575	1,150	3,802	
Shangla	4,514	9,310	294	535	67	116	2,026	
Abbotabad	874	1,864	50	96	1	2	425	
Kohistan	192	383	3,030	5,270	2	4	1,301	
Prices of Production (Rs/ton)								
Mansehra	10,000	1,200	10,000	1,200	20,000	1,000	5,600	
Battagram	10,000	1,200	10,000	1,200	20,000	1,000	5,600	
Shangla	10,000	1,200	10,000	1,200	20,000	1,000	5,600	
Abbotabad	10,000	1,200	10,000	1,200	20,000	1,000	5,600	
Kohistan	10,000	1,200	10,000	1,200	20,000	1,000	5,600	
Loss in Production (Rs Million)								
Mansehra	140.53	38.55	20.70	4.97	6.67	0.51	29.76	
Battagram	68.55	24.68	2.60	0.93	11.50	1.15	21.29	
Shangla	45.14	11.17	2.94	0.64	1.33	0.12	11.35	
Abbotabad	8.74	2.24	0.50	0.12	0.02	0.002	2.378	
Kohistan	1.92	0.46	30.30	6.32	0.04	0.004	7.285	
Total crop losses (million Rs)	264.9	77.1	57.0	13.0	19.6	1.8	72.1	505.4
Total crop losses (million US$)	4.41	1.28	0.95	0.22	0.33	0.03	1.20	8.42

	(million RS)	(million US$)
Sub-total Estimated Direct Crop Sub-sector Damages (a+b+c+d+e+f+g)	**1,300.7**	**21.68**

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Table 7. Crop Productivity Losses

Area in ha	Wheat irrigated (grain)	Wheat irrigated (straw)	Wheat unirrigated (grain)	Wheat unirrigated (straw)	Vegetables	Total
Mansehra	1,475	1,475	12,786	12,786	198	
Battagram	502	502	4,629	4,629	9	
Shangla	442	442	4,551	4,551	127	
Abbotabad	75	75	2,222	2,222	70	
Kohistan	129	129	108	108	32	
Yield per ha in tons						
Mansehra	1.5	1.3	1.0	1.0	20.0	
Battagram	1.5	1.3	1.0	1.0	20.0	
Shangla	1.5	1.3	1.0	1.0	20.0	
Abbotabad	1.5	1.3	1.0	1.0	20.0	
Kohistan	1.5	1.3	1.0	1.0	20.0	
Total Yield in tons						
Mansehra	2,213	1,918	12,786	12,786	3,960	
Battagram	753	653	4,629	4,629	180	
Shangla	663	575	4,551	4,551	2,540	
Abbotabad	113	98	2,222	2,222	1,400	
Kohistan	194	168	108	108	640	
Yield Losses (%)						
Mansehra	30	30	30	30	40	
Battagram	30	30	30	30	40	
Shangla	30	30	30	30	40	
Abbotabad	30	30	30	30	40	
Kohistan	30	30	30	30	40	
Yield Losses in tons						
Mansehra	664	575	3,836	3,836	1,584	
Battagram	226	196	1,389	1,389	72	
Shangla	199	172	1,365	1,365	1,016	
Abbotabad	34	29	667	667	560	
Kohistan	58	50	32	32	256	
Prices of Production (Rs/ton)						
Mansehra	10,500	5,000	10,500	5,000	15,000	
Battagram	10,500	5,000	10,500	5,000	15,000	
Shangla	10,500	5,000	10,500	5,000	15,000	
Abbotabad	10,500	5,000	10,500	5,000	15,000	
Kohistan	10,500	5,000	10,500	5,000	15,000	
Loss in Production (Rs Million)						
Mansehra	6.97	2.88	40.28	19.18	23.76	
Battagram	2.37	0.98	14.58	6.94	1.08	
Shangla	2.09	0.86	14.34	6.83	15.24	
Abbotabad	0.35	0.15	7.00	3.33	8.40	
Kohistan	0.61	0.25	0.34	0.16	3.84	
Total crop losses (million Rs)	12.4	5.1	76.5	36.4	52.3	**182.8**
Total crop losses (million US$)	0.21	0.09	1.28	0.61	0.87	**3.05**

	(million RS)	(million US$)
Sub-total Estimated Indirect Crop Sub-sector Losses (Table 7)	**182.8**	**3.05**

	(million RS)	(million US$)
Total Estimated Crop Sub-sector Damage in NWFP (Table 6+7)	**1,483.5**	**24.73**

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Table 8. Estimated Irrigation Infrastructure Sub-sector Damages in NWFP

National Programme				
Irrigation Infrastructure	No. of water courses	Extent of damages (%)	Cost of damage (million Rs)	Total
Mansehra	60	50	12.0	
Battagram	50	60	12.5	
Shangla	10	50	2.0	
Abbotabad	19	50	7.5	
Kohistan	20	50	4.0	
Total Damage Cost (million Rs)	159			38.0
Total Damage Cost (million US$)				0.63

World Bank Programme							
Irrigation Infrastructure	No. of water courses	Extent of damages (%)	Cost of damage (million Rs)	No. of water tanks	Extent of damages (%)	Cost of damage (million Rs)	Total
Mansehra	70	50	14.0	15	50	0.9	
Battagram	20	60	5.0	5	60	0.3	
Shangla	25	50	5.0	10	50	0.6	
Abbotabad	40	50	8.0	10	50	0.6	
Kohistan	15	60	3.5	5	60	0.3	
Total Damage Cost (million Rs)	170		35.5	45		2.7	38.2
Total Damage Cost (million US$)			0.59			0.05	0.6

	(million RS)	(million US$)
Total Estimated Irrigation Sub-sector Damages in NWFP	76.2	1.27

	(million RS)	(million US$)
Total Estimated Direct Damages in NWFP (Table 4+6+8)	5,258.7	87.64
Total Estimated Indirect Losses in NWFP (Table 5+7)	2,552.8	42.55
Total Estimated Losses in NWFP	7,811.4	130.2

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Table 9. Unit Costs used for Calculation of Damages/Losses (Rs)

		AJK			NWFP				
Item	Unit	Bagh	Muzaffara-bad	Poonch	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Cattle	unit	20,000	30,000	16,000	14,000	15,000	14,000	14,000	15,000
Buffalo	unit	40,000	34,800	50,000	30,000	35,000	35,000	30,000	35,000
Sheep	unit	3,000	3,000	3,000	4,000	4,000	4,000	4,000	4,000
Goats	unit	3,900	3,900	3,900	4,000	4,000	4,000	4,000	4,000
Donkey	unit				6,000	6,000	6,000	6,000	6,000
Poultry	unit	180	180	180	180	180	180	180	180
Milk	kg	25	25	25	25	25	25	25	25
Field terraces	ha	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Fruit trees	no.	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Multi-purpose trees	no.	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Land (total loss)	ha	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Maize grain	ton	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Maize stover	ton	2,250	2,250	2,250	1,200	1,200	1,200	1,200	1,200
Rice (paddy)	ton	15,000	15,000	15,000	20,000	20,000	20,000	20,000	20,000
Rice (straw)	ton	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Grasses	ton	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600
Wheat grain	ton	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Wheat straw	ton	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Vegetables	ton	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Animal shed	sq.ft	100	100	100	100	100	100	100	50
	shed	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
Office buildings etc.	sq.ft.	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Storage lost	hh	15,000	15,000	15,000	10,800	5,700	4,400	10,800	25,600

Productivity Parameters used for Calculation of Losses (no. of units)

		AJK			NWFP				
Item	Unit	Bagh	Muzaffara-bad	Poonch	Mansehra	Battagram	Shangla	Abbotabad	Kohistan
Cattle in milk	%	50%	50%	50%	50%	50%	50%	50%	50%
Buffaloes in milk	%	75%	75%	75%	75%	75%	75%	75%	75%
Goats in milk	%	25%	25%	25%	20%	20%	20%	20%	20%
Milk poductivty loss/animal (9 months)									
- Cattle	kg	225	225	225	225	225	225	225	225
- Buffalo	kg	675	675	675	675	675	675	675	675
- Goat	kg	120	120	120	120	120	120	120	120
Maize grain (irrigated)	t/ha				2.0	1.4	2.2	2.1	2.3
Maize stover (irrigated)	t/ha				4.0	4.2	4.0	4.0	4.0
Maize grain (unirrigated)	t/ha	1.2	1.2	1.2	1.4	1.0	1.6	1.5	1.5
Maize stover (unirrigated)	t/ha	1.4	1.4	1.4	3.2	3.0	3.3	3.2	3.0
Rice (paddy)	t/ha	3.0	3.0	3.0	2.6	2.0	2.3	1.6	1.7
Rice (straw)	t/ha	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Grasses (hay)	t/ha	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Wheat grain (irrigated)	t/ha				1.5	1.5	1.5	1.5	1.5
Wheat straw (irrigated)	t/ha				1.3	1.3	1.3	1.3	1.3
Wheat grain (unirrigated)	t/ha	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0
Wheat straw (unirrigated)	t/ha	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0
Vegetables	t/ha	20	20	20	20	20	20	20	20

Table 10. Livelihood Analysis of NWFP

	Before Quake				After Quake	
Districts	Crop Sector	Livestock Sector	Total Income	% Share of Livestock	Loss to Income	% Loss to livelihood
	Household Income in Rupees					
Mansehra	19881	93835	113716	83	27618	24
Battagram	17493	115826	133319	87	41615	31
Shangla	18956	276745	295701	94	35360	12
Abbotabad	18656	104348	123003	85	42332	34
Kohistan	18854	1128764	1147618	98	224265	20

ANNEX 4

PROGRAMME COST

ANNEX 4

Table 1a. Estimated Programme Cost for Early Recovery, Rehabilitation and Reconstruction of the Agriculture Sector - AJK

Component - Sub-component Main Activity	Cost (Rs Million)				Cost (US$ Million)			
	Early Recovery (up to 6 m.)	Short-term Rehabilitation (6 to 18 m.)	Re-construction (18 m. - 5 yrs.)	Total	Early Recovery (up to 6 m.)	Short-term Rehabilitation (6 to 18 m.)	Re-construction (18 m. - 5 yrs.)	Total
COMPONENT 1								
Rebuilding Agriculture and Rural Livelihoods								
1.1 Recovery and Improvement of farm production systems	2,285.1	2,323.4	10,313.6	14,922.0	38.1	38.7	171.9	248.7
· Livestock production	2,033.1	1,866.2	8,123.3	12,022.6	33.9	31.1	135.4	200.4
Restocking of large and small ruminants and poultry	0.0	559.0	5,030.6	5,589.5	0.0	9.3	83.8	93.2
Rehabilitation of animal sheds	1,374.5	1,030.9	3,092.7	5,498.1	22.9	17.2	51.5	91.6
Provision of animal feed (concentrates)	552.8	276.4	0.0	829.2	9.2	4.6	0.0	13.8
Animal vaccination	105.8	0.0	0.0	105.8	1.8	0.0	0.0	1.8
· Crop production	252.0	378.0	2054.0	2,684.0	4.2	6.3	34.2	44.7
Rehabilitation of terraces	0.0	0.0	90.4	90.4	0.0	0.0	1.5	1.5
Rehabilitation of farm storage	0.0	0.0	1,963.6	1,963.6	0.0	0.0	32.7	32.7
Tillage operations	157.1	0.0	0.0	157.1	2.6	0.0	0.0	2.6
Provision of wheat seed	39.3	0.0	0.0	39.3	0.7	0.0	0.0	0.7
Provision of fertilizers	42.5	0.0	0.0	42.5	0.7	0.0	0.0	0.7
Provision of vegetable seed	13.1	0.0	0.0	13.1	0.2	0.0	0.0	0.2
Provision of agricultural inputs kharif crop	0.0	378.0	0.0	378.0	0.0	6.3	0.0	6.3
Overhead cost (15% of input cost)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
· Agro-forestry	0.0	7.14	64.3	71.4	0.0	0.1	1.1	1.2
Replanting of fruit trees	0.0	4.5	40.5	45.0	0.0	0.1	0.7	0.8
Replanting of multi-purpose trees	0.0	2.6	23.7	26.4	0.0	0.0	0.4	0.4
· Irrigation and other on-farm infrastructure	0.0	72.0	72.0	144.0	0.0	1.2	1.2	2.4
Rehabilitation of irrigation infrastructure (40% of total)	0.0	72.0	72.0	144.0	0.0	1.2	1.2	2.4
1.2 Development and support of community-based activities	60.0	192.0	972.0	1224.0	1.0	3.2	16.2	20.4
· Mobilize and strengthen capacities of existing CBOs	10.0	20.0	150.0	180.0	0.2	0.3	2.5	3.0
· Development of community lands (grazing, forest lands)	10.0	20.0	150.0	180.0	0.2	0.3	2.5	3.0
· Community irrigation (40% of total)	0.0	72.0	72.0	144.0	0.0	1.2	1.2	2.4
· Community infrastructure	40.0	80.0	600	720.0	0.7	1.3	10.0	12.0
1.3 Targeted support to improve livelihoods of vulnerable groups	180.0	300.0	900.0	1380.0	3.0	5.0	15.0	23.0
· Conduct participatory livelihoods and needs analysis	20.0	30.0	0.0	50.0	0.3	0.5	0.0	0.8
· Distribution of livestock to landless	100.0	150.0	200.0	450.0	1.7	2.5	3.3	7.5
· Other targeted interventions	60.0	120.0	700.0	880.0	1.0	2.0	11.7	14.7
1.4 Livelihoods diversification	0.0	18.0	300.0	318.0	0.0	0.30	5.0	5.3
· Promote new economic activities	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
· Strengthen market linkages	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
· Promote local value-addition	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
Sub-total Component 1	2,525.1	2,833.4	12,485.6	17,844.0	42.1	47.2	208.1	297.4
COMPONENT 2								
Rehabilitation and Improvement of Support Services								
2.1 Rehabilitation of public services facilities	0.00	380.79	1,070.38	1,451.17	-	6.3	17.8	24.2
- Dep. of Livestock infrastructure (e.g. office buildings, training centres, vet. centres)	0.0	173.1	519.4	692.6	0.0	2.9	8.7	11.5
- Dep. of Agriculture infrastructure (e.g. office buildings, training centres, nurseries)	0.0	171.7	515.0	686.6	0.0	2.9	8.6	11.4
- Public irrigation infrastructure (20% of irrigation rehabilitation	0.0	36.0	36.0	72.0	0.0	0.6	0.6	1.20
2.2 Participatory evaluation and promotion of new technologies	6.0	12.0	120.0	138.0	0.1	0.2	2	2.3
· Validation of appropriate new technologies	6.0	6.0		12.0	0.1	0.1	0.0	0.2
· Pilot testing and evaluation		6.0	24.0	30.0	0.0	0.1	0.4	0.5
· Upscaling			96.0	96.0	0.0	0.0	1.6	1.6
2.3 Improvement of support services	6.0	12.0	180.0	198.0	0.1	0.2	3.0	3.3
· Strengthen public-private partnerships for service delivery	2.0	4.0	30.0	36.0	0.03	0.1	0.5	0.6
· Creation of producers/traders associations			50.0	50.0	0.00	0.0	0.8	0.8
· Facilitate private sector service delivery	2.0	4.0	50.0	56.0	0.03	0.1	0.8	0.9
· Improve rural finance services	2.0	4.0	50.0	56.0	0.03	0.1	0.8	0.9
2.4 Re-establishment of land and property rights	6	12	180	198.0	0.1	0.2	3	3.3
	6.0	12.0	180.0	199.0	0.1	0.2	3.0	3.3
Sub-total Component 2	18.0	416.8	1,550.4	1,985.2	0.3	6.9	25.8	33.1
COMPONENT 3								
Coordination and Monitoring and Evaluation	21	21	60	102.0	0.4	0.4	1.0	1.7
	21.0	21.0	60.0	102.0	0.35	0.4	1.0	1.7
TOTAL	2,564.11	3,271.17	14,095.94	19,931.22	42.7	54.5	234.9	332.2

ANNEX 4

Table 1b. Estimated Programme Cost for Early Recovery, Rehabilitation and Reconstruction of the Agriculture Sector - NWFP

Component - Sub-component Main Activity	Cost (Rs Million)				Cost (US$ Million)			
	Early Recovery (up to 6 m.)	Short-term Rehabilitation (6 to 18 m.)	Re-construction (18 m. - 5 yrs.)	Total	Early Recovery (up to 6 m.)	Short-term Rehabilitation (6 to 18 m.)	Re-construction (18 m. - 5 yrs.)	Total
COMPONENT 1								
Rebuilding Agriculture and Rural Livelihoods								
1.1 Recovery and improvement of farm production systems	1,772.9	1,764.1	6,320.0	9,857.1	29.5	29.4	105.3	164.3
· Livestock production	1,513.5	1,346.2	5,709.8	8,569.5	25.2	22.4	95.2	142.8
Restocking of large and small ruminants and poultry	0.0	362.1	3,258.5	3,620.5	0.0	6.0	54.3	60.3
Rehabilitation of animal sheds	1,089.5	817.1	2,451.3	4,357.9	18.2	13.6	40.9	72.6
Provision of animal feed (concentrates)	334.0	167.0	0.0	501.1	5.6	2.8	0.0	8.4
Animal vaccination	89.9	0.0	0.0	89.9	1.5	0.0	0.0	1.5
· Crop production	259.4	389.2	533.9	1,182.5	4.3	6.5	8.9	19.7
Rehabilitation of terraces	0.0	0.0	33.5	33.5	0.0	0.0	0.6	0.6
Rehabilitation of farm storage	0.0	0.0	500.5	500.5	0.0	0.0	8.3	8.3
Tillage operations	124.5	0.0	0.0	124.5	2.1	0.0	0.0	2.1
Provision of wheat seed	31.1	0.0	0.0	31.1	0.5	0.0	0.0	0.5
Provision of fertilizers	96.0	0.0	0.0	96.0	1.6	0.0	0.0	1.6
Provision of vegetable seed	7.8	0.0	0.0	7.8	0.1	0.0	0.0	0.1
Provision of agricultural inputs kharif crop	0.0	359.2	0.0	389.2	0.0	6.5	0.0	6.5
Overhead cost (15% of input cost)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
· Agro-forestry	0.0	5.93	53.4	59.3	0.0	0.1	0.9	1.0
Replanting of fruit trees	0.0	2.5	22.9	25.4	0.0	0.0	0.4	0.4
Replanting of multi-purpose trees	0.0	3.4	30.5	33.9	0.0	0.1	0.5	0.6
· Irrigation and other on-farm infrastructure	0.0	22.9	22.9	45.7	0.0	0.4	0.4	0.8
Rehabilitation of irrigation infrastructure (40% of total)	0.0	22.9	22.9	45.7	0.0	0.4	0.4	0.8
1.2 Development and support of community-based activities	60.0	142.9	922.9	1125.7	1.0	2.4	15.4	18.8
· Mobilize and strengthen capacities of existing CBOs	10.0	20.0	150.0	180.0	0.2	0.3	2.5	3.0
· Development of community lands (grazing, forest lands)	10.0	20.0	150.0	180.0	0.2	0.3	2.5	3.0
· Community irrigation (40% of total)	0.0	22.9	22.9	45.7	0.0	0.4	0.4	0.8
· Community infrastructure	40.0	80.0	600.0	720.0	0.7	1.3	10.0	12.0
1.3 Targeted support to improve livelihoods of vulnerable groups	180.0	300.0	900.0	1380.0	3.0	5.0	15.0	23.0
· Conduct participatory livelihoods and needs analysis	20.0	30.0	0.0	50.0	0.3	0.5	0.0	0.8
· Distribution of livestock to landless	100.0	150.0	200.0	450.0	1.7	2.5	3.3	7.5
· Other targeted interventions	60.0	120.0	700.0	880.0	1.0	2.0	11.7	14.7
1.4 Livelihoods diversification	0.0	18.0	300.0	318.0	0.0	0.30	5.0	5.3
· Promote new economic activities	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
· Strengthen market linkages	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
· Promote local value-addition	0.0	6.0	100.0	106.0	0.0	0.1	1.7	1.8
Sub-total Component 1	2,012.9	2,225.0	8,442.9	12,680.8	33.5	37.1	140.7	211.3
COMPONENT 2								
Rehabilitation and Improvement of Support Services								
2.1 Rehabilitation of public services facilities	0.00	52.69	135.21	187.90	-	0.9	2.3	3.1
- Dep. of Livestock infrastructure (e.g. office buildings, training centres, vet. centres)	0.0	24.0	71.9	95.8	0.0	0.4	1.2	1.6
- Dep. of Agriculture infrastructure (e.g. office buildings, training centres, nurseries)	0.0	17.3	51.9	69.2	0.0	0.3	0.9	1.2
- Public irrigation infrastructure (20% of irrigation rehabilitation	0.0	11.4	11.4	22.9	0.0	0.2	0.2	0.38
2.2 Participatory evaluation and promotion of new technologies	6.0	12.0	120.0	138.0	0.1	0.2	2	2.3
· Validation of appropriate new technologies	6.0	6.0		12.0	0.1	0.1	0.0	0.2
· Pilot testing and evaluation		6.0	24.0	30.0	0.0	0.1	0.4	0.5
· Upscaling			96.0	96.0	0.0	0.0	1.6	1.6
2.3 Improvement of support services	6.0	12.0	180.0	198.0	0.1	0.2	3.0	3.3
· Strengthen public-private partnerships for service delivery	2.0	4.0	30.0	36.0	0.03	0.1	0.5	0.6
· Creation of producers/traders associations			50.0	50.0	0.00	0.0	0.8	0.8
· Facilitate private sector service delivery	2.0	4.0	50.0	56.0	0.03	0.1	0.8	0.9
· Improve rural finance services	2.0	4.0	50.0	56.0	0.03	0.1	0.8	0.9
2.4 Re-establishment of land and property rights	6	12	180	198.0	0.1	0.2	3	3.3
	6.0	12.0	180.0	198.0	0.1	0.2	3.0	3.3
Sub-total Component 2	18.0	88.7	615.2	721.9	0.3	1.5	10.3	12.0
COMPONENT 3								
Coordination and Monitoring and Evaluation	21	21	60	102.0	0.4	0.4	1.0	1.7
	21.0	21.0	60.0	102.0	0.35	0.4	1.0	1.7
TOTAL	2,051.92	2,334.69	9,118.07	13,504.68	34.2	38.9	152.0	225.1

ANNEX 4

Table 2. Summary of Estimates of Losses and Direct Reconstruction Costs

Area	Sub-sector	Direct Damages	Indirect Losses	Total Losses	Reconstruction Cost [1)]
			(million Rs)		
Azad Jammuh and Kashmir	Livestock	8,261.4	3,600.4	11,861.8	12,715.2
	Crop	4,325.2	300.8	4,626.0	3,442.0
	Irrigation	240.0	-	240.0	360.0
	Total	**12,826.6**	**3,901.2**	**16,727.8**	**16,517.2**
North West Frontier Province	Livestock	3,881.7	2,370.0	6,251.7	8,665.3
	Crop	1,300.7	182.8	1,483.5	1,311.1
	Irrigation	76.2	-	76.2	114.3
	Total	**5,258.7**	**2,552.8**	**7,811.4**	**10,090.7**
Total AJK and NWFP	Livestock	12,143.2	5,970.4	18,113.5	21,380.5
	Crop	5,625.9	483.6	6,109.5	4,753.1
	Irrigation	316.2	-	316.2	474.3
	Total	**18,085.3**	**6,454.0**	**24,539.3**	**26,607.9**
			(million US$)		
Azad Jammuh and Kashmir	Livestock	137.7	60.0	197.7	211.9
	Crop	72.1	5.0	77.1	57.4
	Irrigation	4.0	-	4.0	6.0
	Total	**213.8**	**65.0**	**278.8**	**275.3**
North West Frontier Province	Livestock	64.7	39.5	104.2	144.4
	Crop	21.7	3.0	24.7	21.9
	Irrigation	1.3	-	1.3	1.9
	Total	**87.6**	**42.5**	**130.2**	**168.2**
Total AJK and NWFP	Livestock	202.4	99.5	301.9	356.3
	Crop	93.8	8.1	101.8	79.2
	Irrigation	5.3	-	5.3	7.9
	Total	**301.4**	**107.6**	**409.0**	**443.5**

Note: Programme costs will exceed reconstruction costs due to inclusion of additional activities not directly related to damages.
1) for total programme costs including development activities, see Annex 5 and 6.

ANNEX 4

Table 3a. Total Losses and Direct Reconstruction Costs for Agriculture Sector - AJK (Rs Million)

	Subsector/Item	Losses			Costs			
		Direct Damage	Indirect Losses	Total Losses	Early Recoverty (within 6 months)	Short Term Rehabilitation (6 - 18 months)	Medium/ Long Term Re-construction (18 months to 5 years)	Total Costs [1]
1.0	**Crop**							
1.1	Maize, paddy, and forthcoming wheat/vegetables	1,324.8	300.8	1,625.6	-	-	-	-
1.2	Losses to terraces	90.4	-	90.4	-	-	90.4	90.4
1.3	Land loss	131.6		131.6				-
1.4	Fruit trees	225.2		225.2	-	4.5	40.5	45.0
1.5	Multi-purpose trees	131.9		131.9		2.6	23.7	26.4
1.6	Damage to extension and research buildings	457.7	-	457.7	-	171.7	515.0	686.6
1.7	Damage to farm storage	1,963.6	-	1,963.6	-	-	1,963.6	1,963.6
1.8	Tillage operations	-	-	-	157.1	-	-	157.1
1.9	Wheat seed	-	-	-	39.3	-	-	39.3
1.10	Fertilizers	-	-	-	42.5	-	-	42.5
1.11	Vegetable packs	-	-	-	13.1	-	-	13.1
1.12	Agricultural inputs kharif crop					378.0		378.0
	Subtotal	**4,325.2**	**300.8**	**4,626.0**	**252.0**	**556.8**	**2,633.3**	**3,442.04**
2.0	**Livestock**							
2.1	Large and small ruminants and poultry	4,657.9	-	4,657.9	-	559.0	5,030.6	5,589.5
2.2	Milk production losses	-	3,600.4	3,600.4	-	-	-	-
2.3	Animal sheds	3,141.8	-	3,141.8	1,374.5	1,030.9	3,092.7	5,498.1
2.4	Damage to extension and research buildings	461.7	-	461.7	-	173.1	519.4	692.6
2.5	Animal feed (concentrates)	-	-	-	552.8	276.4	-	829.2
2.6	Animal vaccination				105.8			105.8
	Subtotal	**8,261.4**	**3,600.4**	**11,861.8**	**2,033.1**	**2,039.4**	**8,642.7**	**12,715.2**
3.0	**Irrigation**	-	-	-		-	-	-
3.1	Water channels	175.0	-	175.0	-	131.3	131.3	262.5
3.2	Diversions	43.8	-	43.8	-	32.8	32.8	65.6
3.3	Water lifts	6.3	-	6.3	-	4.7	4.7	9.4
3.4	Water spillways	5.0	-	5.0	-	3.8	3.8	7.5
3.5	Water tanks	10.0	-	10.0	-	7.5	7.5	15.0
	Subtotal	**240.0**	**-**	**240.0**	**-**	**180.0**	**180.0**	**360.0**
	Total	**12,826.6**	**3,901.2**	**16,727.8**	**2,285.11**	**2,776.2**	**11,455.9**	**16,517.2**

1) for total programme costs including development activities, see Annex 5

ANNEX 4

Table 3b. Total Losses and Direct Reconstruction Costs for Agriculture Sector - AJK (US$ Million)

	Subsector/Item	Losses			Costs			
		Direct Damage	Indirect Losses	Total Losses	Early Recoverty (within 6 months)	Short Term Rehabilitation (6 - 18 months)	Medium/ Long Term Re-construction (18 months to 5 years)	Total Costs [1]
1.0	**Crop**							
1.1	Maize, paddy, and forthcoming wheat/vegetables	22.1	5.0	27.1	-	-	-	-
1.2	Losses to terraces	1.5	-	1.5	-	-	1.5	1.5
1.3	Land loss	2.2		2.2				
1.4	Fruit trees	3.8		3.8	-	0.1	0.7	0.8
1.5	Multi-purpose trees	2.2		2.2		0.04	0.4	0.4
1.6	Damage to extension and research buildings	7.6	-	7.6	-	2.9	8.6	11.4
1.7	Damage to farm storage	32.7	-	32.7	-	-	32.7	32.7
1.8	Tillage operations	-	-	-	2.6	-	-	2.6
1.9	Wheat seed	-	-	-	0.7	-	-	0.7
1.10	Fertilizers	-	-	-	0.7	-	-	0.7
1.11	Vegetable packs	-	-	-	0.2	-	-	0.2
1.12	Agricultural inputs kharif crop	-	-	-	-	6.3	-	6.3
	Subtotal	**72.1**	**5.0**	**77.1**	**4.2**	**9.3**	**43.9**	**57.37**
								-
2.0	**Livestock**							
2.1	Large and small ruminants and poultry	77.6	-	77.6	-	9.3	83.8	93.2
2.2	Milk production losses	-	60.0	60.0	-	-	-	-
2.3	Animal sheds	52.4	-	52.4	22.9	17.2	51.5	91.6
2.4	Damage to extension and research buildings	7.7	-	7.7	-	2.9	8.7	11.5
2.5	Animal feed (concentrates)	-	-		9.2	4.6	-	13.8
2.6	Animal vaccination				1.8			1.8
	Subtotal	**137.7**	**60.0**	**197.7**	**33.9**	**34.0**	**144.0**	**211.9**
3.0	**Irrigation**	-	-	-		-	-	-
3.1	Water channels	2.9	-	2.9	-	2.2	2.2	4.4
3.2	Diversions	0.7	-	0.7	-	0.5	0.5	1.1
3.3	Water lifts	0.1	-	0.1	-	0.1	0.1	0.2
3.4	Water spillways	0.1	-	0.1	-	0.1	0.1	0.1
3.5	Water tanks	0.2	-	0.2	-	0.1	0.1	0.3
	Subtotal	**4.0**	**-**	**4.0**	**-**	**3.0**	**3.0**	**6.0**
	Total	**213.8**	**65.0**	**278.8**	**38.1**	**46.3**	**190.9**	**275.3**

1) for total programme costs including development activities, see Annex 5

ANNEX 4

Table 4a. Total Losses and Direct Reconstruction Costs for Agriculture Sector in NWFP (Rs Million)

	Subsector/Item	Losses			Costs			
		Direct Damage	Indirect Losses	Total Losses	Early Recoverty (within 6 months)	Short Term Rehabilitation (6 - 18 months)	Medium/ Long Term Re-construction (18 months to 5 years)	Total Costs [1]
1.0	**Crop**							
1.1	Maize, paddy, and forthcoming wheat/vegetables	505.4	182.8	688.2	-	-	-	-
1.2	Losses to terraces	33.5	-	33.5	-	-	33.5	33.5
1.3	Land loss	93.0		93.0				-
1.4	Fruit trees	127.1		127.1	-	2.5	22.9	25.4
1.5	Multi-purpose trees	169.5		169.5		3.4	30.5	33.9
1.6	Damage to extension and research buildings	46.2	-	46.2	-	17.3	51.9	69.2
1.7	Damage to farm storage	326.1	-	326.1	-	-	500.5	500.5
1.8	Tillage operations	-	-	-	124.5	-	-	124.5
1.9	Wheat seed	-	-	-	31.1	-	-	31.1
1.10	Fertilizers	-	-	-	96.0	-	-	96.0
1.11	Vegetable seeds	-	-	-	7.8	-	-	7.8
1.12	Agricultural inputs kharif crop					389.2		389.2
	Subtotal	**1,300.7**	**182.8**	**1,483.5**	**259.4**	**412.4**	**639.2**	**1,311.1**
2.0	**Livestock**							
2.1	Large and small ruminants and poultry	3,017.1	-	3,017.1	-	362.1	3,258.5	3,620.5
2.2	Milk production losses	-	2,370.0	2,370.0	-	-	-	-
2.3	Animal sheds	800.7	-	800.7	1,089.5	817.1	2,451.3	4,357.9
2.4	Damage to extension and research buildings	63.9	-	63.9	-	24.0	71.9	95.8
2.5	Animal feed (concentrates)	-	-	-	334.0	167.0	-	501.1
2.6	Animal vaccination				89.9			89.9
	Subtotal	**3,881.7**	**2,370.0**	**6,251.7**	**1,513.5**	**1,370.1**	**5,781.7**	**8,665.3**
3.0	**Irrigation**	-	-	-		-	-	-
3.1	Water courses	73.5	-	73.5	-	55.1	55.1	110.3
3.2	Diversions		-	-	-		-	-
3.3	Water lifts		-	-	-		-	-
3.4	Water spillways		-	-	-		-	-
3.5	Water tanks	2.7	-	2.7	-	2.03	2.03	4.1
	Subtotal	**76.2**	**-**	**76.2**	**-**	**57.2**	**57.2**	**114.3**
	Total	**5,258.7**	**2,552.8**	**7,811.4**	**1,772.9**	**1,839.7**	**6,478.1**	**10,090.7**

1) for total programme costs including development activities, see Annex 6

Table 4b. Total Losses and Direct Reconstruction Costs for Agriculture Sector in NWFP (US$ Million)

	Subsector/Item	Losses			Costs			
		Direct Damage	Indirect Losses	Total Losses	Early Recoverty (within 6 months)	Short Term Rehabilitation (6 - 18 months)	Medium/ Long Term Re-construction (18 months to 5 years)	Total Costs [1]
1.0	**Crop**							
1.1	Maize, paddy, and forthcoming wheat/vegetables	8.4	3.0	11.5	-	-	-	-
1.2	Losses to terraces	0.6	-	0.6	-	-	0.6	0.6
1.3	Land loss	1.5		1.5				
1.4	Fruit trees	2.1		2.1	-	0.04	0.4	0.4
1.5	Multi-purpose trees	2.8		2.8		0.1	0.5	0.6
1.6	Damage to extension and research buildings	0.8	-	0.8	-	0.3	0.9	1.2
1.7	Damage to farm storage	5.4	-	5.4	-	-	8.3	8.3
1.8	Tillage operations	-	-	-	2.1	-	-	2.1
1.9	Wheat seed	-	-	-	0.5	-	-	0.5
1.10	Fertilizers	-	-	-	1.6	-	-	1.6
1.11	Vegetable seeds	-	-	-	0.1	-	-	0.1
1.12	Agricultural inputs kharif crop				-	6.5	-	6.5
	Subtotal	**21.7**	**3.0**	**24.7**	**4.3**	**6.9**	**10.7**	**21.9**
2.0	**Livestock**							
2.1	Large and small ruminants and poultry	50.3	-	50.3	-	6.0	54.3	60.3
2.2	Milk production losses	-	39.5	39.5	-	-	-	-
2.3	Animal sheds	13.3	-	13.3	18.2	13.6	40.9	72.6
2.4	Damage to extension and research buildings	1.1	-	1.1	-	0.4	1.2	1.6
2.5	Animal feed (concentrates)	-	-		5.6	2.8	-	8.4
2.6	Animal vaccination				1.5			1.5
	Subtotal	**64.7**	**39.5**	**104.2**	**25.2**	**22.8**	**96.4**	**144.4**
3.0	Irrigation	-	-	-		-	-	-
3.1	Water courses	1.2	-	1.2	-	0.9	0.9	1.8
3.2	Diversions	-	-	-	-	-	-	-
3.3	Water lifts	-	-	-	-	-	-	-
3.4	Water spillways	-	-	-	-	-	-	-
3.5	Water tanks	0.0	-	0.0	-	0.03	0.03	0.1
	Subtotal	**1.3**	-	**1.3**	-	**1.0**	**1.0**	**1.9**
	Total	**87.6**	**42.5**	**130.2**	**29.5**	**30.7**	**108.0**	**168.2**
					18%	18%	64%	100%
	Grand Total AJK and NWFP			**409.0**	**67.6**	**76.9**	**298.9**	**443.5**

1) for total programme costs including development activities, see Annex 6

ANNEX 4

Table 5. Estimated Cost of Interventions for Early Recovery in AJK

Households (hh)			
District	Total no. of hh	hh affected	
		%	No.
Bagh	45,151	95%	42,893
Muzaffarabad	73,562	95%	69,979
Poonch	39,207	46%	18,035
Total	158,020		130,908

Table 5a. Crop Sub-sector

Crop Priority Needs

	Wheat			Winter Vegetables
	Tillage	Seed	Fertilizer urea	
Priority Order	2	1	1	2
No. of beneficiary households				
Bagh	21,447	21,447	21,447	42,893
Muzaffarabad	34,989	34,989	34,989	69,979
Poonch	9,018	9,018	9,018	18,035

No. of Input Units per hh

	Unit	Tillage Hour	Seed kg	Urea 50 kg bag	Vegetables Pack
Bagh		8	30	1	5
Muzaffarabad		8	30	1	5
Poonch		8	30	1	5

Cost of Reconstruction/Inputs including Transport per Base Unit (Rs)

	Unit	Tillage Hour	Seed kg	Urea 50 kg bag	Vegetables Pack
Bagh		300	20	650	20
Muzaffarabad		300	20	650	20
Poonch		300	20	650	20

Cost of Reconstruction/Inputs including Transport per Final Unit (Rs)

	Unit	Tillage Hour	Seed Ton	Urea Ton	Vegetables Pack
Bagh		300	20,000	13,000	20
Muzaffarabad		300	20,000	13,000	20
Poonch		300	20,000	13,000	20

Total No. of Units

	Unit	Tillage Hour	Seed Ton	Urea Ton	Vegetables Pack
Bagh		171,574	643	1,072	214,467
Muzaffarabad		279,916	1,050	1,749	349,895
Poonch		72,141	271	451	90,176

Total Cost (million Rs)

	Tillage	Seed	Urea	Vegetables	Inputs Kharif Crop *	Total
Bagh	51	13	14	4	124	206.4
Muzaffarabad	84	21	23	7	202	336.8
Poonch	22	5	6	2	52	86.8

** 1.5 times cost of rabi crop inputs*

Fruit and Multi-purpose Trees *	Fruit trees (Rs million)	Multi-purpose trees (Rs million)	Total cost (Rs million)	Total cost (US$ million)
Bagh	18.1	10.6	29	0.5
Muzaffarabad	24.0	11.1	35	0.6
Poonch	3.0	4.6	8	0.1
Total cost	45.0	26.4	71.4	1.2

** replanting cost = 20% of damages*

Rehabilitation of Agricultural Office Buildings

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Agric. Research & Extension	Sq. ft	457,749	1,500	686.6	11.44
Total				686.6	11.44

Rehabilitation of Production Infrastructure

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Farm level storage	no.	130,908	15,000	1,963.6	32.73
Field terraces	ha	3,014	30,000	90.4	1.51
Total				2,054.0	34.23

	(million RS)	(million US$)
Sub-total Needs in the Crop Subsector in AJK	3,442.04	57.37

ANNEX 4

Table 5b. Livestock Sub-sector

Livestock Priority Needs

	Livestock Shelter	Animal feeds[1)]
Priority Order	1	2
No. of beneficiary households		
Bagh	30,025	38,895
Muzaffarabad	48,985	127,186
Poonch	12,625	141,013

1) cattle/buffaloes in milk

No. of Shelter/Input Units

	Unit	Shelter	Concentrates	Vet. medicine and vaccines Cattle and Buffaloes	Sheep and Goat
		No.	kg/animal	lumpsum/animal	lumpsum/animal
Bagh		1	270	1	1
Muzaffarabad		1	270	1	1
Poonch		1	270	1	1

Cost of Reconstruction/Inputs including Transport per Base Unit (Rs)

	Unit	Shelter	Concentrates	Vet. medicine and vaccines Cattle and Buffaloes	Sheep and Goat
		No.	50 kg bag	animal	animal
Bagh		60,000	500	300	150
Muzaffarabad		60,000	500	300	150
Poonch		60,000	500	300	150

Total No. of Final Units

	Unit	Shelter	Concentrates	Vet. medicine and vaccines Cattle and Buffaloes	Sheep and Goat
		No.	Ton	animal	animal
Bagh		30,025	10,502	31,221	39,619
Muzaffarabad		48,985	34,340	113,040	111,253
Poonch		12,625	38,073	112,633	40,790

Total Cost (million Rs)

	Shelter	Concentrates	Vet. medicine and vaccines Cattle and Buffaloes	Sheep and Goat	Restocking	Total
Bagh	1801.5	105.0	9.37	5.94	2,203.2	4,125.1
Muzaffarabad	2939.1	343.4	33.91	16.69	2,943.9	6,277.0
Poonch	757.5	380.7	33.79	6.12	442.4	1,620.5
Total cost (million Rs)	5,498.1	829.2	77.1	28.7	5,589.5	12,022.6
Total cost (million US$)	91.6	13.8	1.3	0.5	93.2	200.4

Rehabilitation of Agricultural Office Buildings

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Livestock & Dairy Development	Sq. ft	461,700	1,500	692.6	11.54
Total				692.6	11.54

	(million RS)	(million US$)
Sub-total Needs in the Livestock Subsector in AJK	12,715.2	211.9

Table 5c. Irrigation Subsector

Rehabilitation of Irrigation Infrastructure

Item	Unit	No. of units	Total Cost (million Rs)	(million US$)
Irrigation channels	no.	350	262.5	4.39
Diversions	no.	350	65.6	1.10
Water lifting devices	no.	200	9.4	0.16
Water spillways	no.	20	7.5	0.13
Water tanks	no.	40	15.0	0.25
Total			360.0	6.03

	(million RS)	(million US$)
Total Needs in AJK (Table 5 a+b+c)	16,517.2	275.3

ANNEX 4

Table 6. Estimated Cost of Interventions for Early Recovery in NWFP

Farm Households (hh)			
District	Total no. of hh	hh affected	
		%	No.
Mansehra	58,403	90%	52,563
Battagram	27,892	100%	27,892
Shangla	6,193	100%	6,193
Abbotabad	12,881	90%	11,593
Kohistan	5,520	100%	5,520
Total	110,889		103,761

Table 6a. Crop Sub-sector

Crop Priority Needs

	Wheat				Winter Vegetables
	Tillage	Seed	Fertilizer urea	Fertilizer DAP	
Priority Order	2	1	1	1	2
No. of beneficiary households					
Mansehra	26,281	26,281	26,281	26,281	52,563
Battagram	13,946	13,946	13,946	13,946	13,946
Shangla	3,097	3,097	3,097	3,097	3,097
Abbotabad	5,796	5,796	5,796	5,796	5,796
Kohistan	2,760	2,760	2,760	2,760	2,760

No. of Input Units per hh

	Unit	Tillage Hour	Seed kg	Urea 50 kg bag	DAP 50 kg bag	Vegetables Pack
Mansehra		8	30	1	1	5
Battagram		8	30	1	1	5
Shangla		8	30	1	1	5
Abbotabad		8	30	1	1	5
Kohistan		8	30	1	1	5

Cost of Reconstruction/Inputs including Transport per Base Unit (Rs)

	Unit	Tillage Hour	Seed kg	Urea 50 kg bag	DAP 50 kg bag	Vegetables Pack
Mansehra		300	20	650	1,200	20
Battagram		300	20	650	1,200	20
Shangla		300	20	650	1,200	20
Abbotabad		300	20	650	1,200	20
Kohistan		300	20	650	1,200	20

Cost of Reconstruction/Inputs including Transport per Final Unit (Rs)

	Unit	Tillage Hour	Seed Ton	Urea Ton	DAP Ton	Vegetables Pack
Mansehra		300	20,000	13,000	24,000	20
Battagram		300	20,000	13,000	24,000	20
Shangla		300	20,000	13,000	24,000	20
Abbotabad		300	20,000	13,000	24,000	20
Kohistan		300	20,000	13,000	24,000	20

Total No. of Units

	Unit	Tillage Hour	Seed Ton	Urea Ton	DAP Ton	Vegetables Pack
Mansehra		210,251	788	1,314	1,314	262,814
Battagram		111,568	418	697	697	69,730
Shangla		24,772	93	155	155	15,483
Abbotabad		46,372	174	290	290	28,982
Kohistan		22,080	83	138	138	13,800

ANNEX 4

Table 6a. Crop Sub-sector (cont.)

Total Cost (million Rs)

	Tillage	Seed	Urea	DAP	Vegetables	Inputs Kharif Crop *	Total
Mansehra	63.1	15.8	17.1	31.5	5.3	199	331.8
Battagram	33.5	8.4	9.1	16.7	1.4	104	172.6
Shangla	7.4	1.9	2.0	3.7	0.3	23	38.3
Abbotabad	13.9	3.5	3.8	7.0	0.6	43	71.7
Kohistan	6.6	1.7	1.8	3.3	0.3	20	34.2
Total (million Rs)	124.5	31.1	33.7	62.3	7.8	389.2	**648.6**
Total (million US$)	2.08	0.52	0.56	1.04	0.13	6.49	**10.8**
Overhead cost (million Rs) *							**0.0**
Overhead cost (million US$) *							**0.0**
Total cost (million Rs)	124.51	31.13	33.72	62.26	7.82	389.15	**648.6**
Total cost (million US$)	2.08	0.52	0.56	1.04	0.13	6.49	**10.8**

** 1.5 times cost of rabi crop inputs*

Fruit and Multi-purpose Trees *	Fruit trees (RS million)	Multi-purpose trees (Rs million)	Total cost (Rs million)	Total cost (US$ million)
Mansehra	10.5	14.1	25	0.4
Battagram	6.2	8.3	14	0.2
Shangla	3.3	4.4	8	0.1
Abbotabad	3.0	4.1	7	0.1
Kohistan	2.3	3.1	5	0.1
Total cost	25.4	33.9	**59.3**	**1.0**

* replanting cost = 20% of damages

Rehabilitation of Agricultural Office Buildings

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Agric. Research & Extension	Sq. ft	46,150	1,500	69.2	1.16
Total				**69.2**	**1.16**

Rehabilitation of Production Infrastructure

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Farm level storage	no.	33,364	15,000	500.5	8.34
Field terraces	ha	1,115	30,000	33.5	0.56
Total				**533.9**	**8.90**

	(million RS)	(million US$)
Sub-total Needs in the Crop Subsector in NWFP	**1,311.1**	**21.86**

ANNEX 4

Table 6b. Livestock Sub-sector

Livestock Priority Needs

	Unit	Livestock Shelter	Animal feeds[1)]
		hh	No. animal
Priority Order		1	2
No. of units			
Mansehra		36,794	80,081
Battagram		19,524	56,888
Shangla		4,335	10,772
Abbotabad		8,115	15,817
Kohistan		3,864	22,025

1) cattle/buffaloes in milk

No. of Shelter/Input Units

				Vet. medicine and vaccines	
		Shelter	Concentrates	Cattle and Buffaloes	Sheep and Goat
	Unit	no./hh	kg/animal	lumpsum/animal	lumpsum/animal
Mansehra		1	270	1	1
Battagram		1	270	1	1
Shangla		1	270	1	1
Abbotabad		1	270	1	1
Kohistan		1	270	1	1

Cost of Reconstruction/Inputs including Transport per Base Unit (Rs)

				Vet. medicine and vaccines	
		Shelter	Concentrates	Cattle and Buffaloes	Sheep and Goat
	Unit	No.	50 kg bag	animal	animal
Mansehra		60,000	500	300	150
Battagram		60,000	500	300	150
Shangla		60,000	500	300	150
Abbotabad		60,000	500	300	150
Kohistan		60,000	500	300	150

Total No. of Final Units

				Vet. medicine and vaccines	
		Shelter	Concentrates	Cattle and Buffaloes	Sheep and Goat
	Unit	No.	Ton	Animal	Animal
Mansehra		36,794	21,622	64,663	79,880
Battagram		19,524	15,360	49,125	70,875
Shangla		4,335	2,908	9,271	8,280
Abbotabad		8,115	4,270	13,139	22,176
Kohistan		3,864	5,947	20,286	105,469

ANNEX 4

Table 6b. Livestock Sub-sector (cont.)

Total Cost (million Rs)

	Shelter	Concentrates	Vet. medicine and vaccines		Restocking	Total
			Cattle and Buffaloes	Sheep and Goat		
Mansehra	2208	216	19	12	1,264	3,719
Battagram	1171	154	15	11	1,466	2,816
Shangla	260	29	3	1	51	344
Abbotabad	487	43	4	3	478	1,015
Kohistan	232	59	6	16	362	675
Total cost (million Rs)	4,357.9	501.1	46.9	43.0	3,620.5	8,569.5
Total cost (million US$)	72.63	8.35	0.78	0.72	60.34	142.8

Rehabilitation of Agricultural Office Buildings

Item	Unit	No. of units	Cost/unit (Rs)	Total Cost (million Rs)	(million US$)
Livestock & Dairy Development	Sq. ft	63,875	1,500	95.8	1.60
Total				**95.8**	**1.6**

	(million RS)	(million US$)
Sub-total Needs in the Livestock Subsector in NWFP	**8,665.3**	**144.43**

Table 6c. Irrigation Subsector

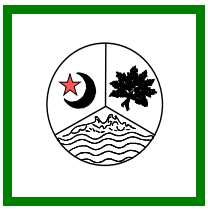
Rehabilitation of Irrigation Infrastructure

Item	Unit	No. of units	Total Cost (million Rs)	(million US$)
Mansehra	water course/tanks	130	39.0	0.65
Battagram	water course/tanks	70	26.3	0.44
Shangla	water course/tanks	35	10.5	0.18
Abbotabad	water course/tanks	59	23.3	0.39
Kohistan	water course/tanks	35	11.3	0.19
Mansehra	water tank	15	1.4	0.02
Battagram	water tank	5	0.5	0.01
Shangla	water tank	10	0.9	0.02
Abbotabad	water tank	10	0.9	0.02
Kohistan	water tank	5	0.5	0.01
Total		329	**114.3**	**1.91**

	(million RS)	(million US$)
Total Needs in NWFP (a+b+c)	**10,090.7**	**168.2**

ANNEX 5

LIVELIHOOD IN AJK



Department of Agriculture
Muzaffarabad

Food and Agriculture Organization
of the United Nations (FAO)
Livelihoods Support Programme

POST-EARTHQUAKE
RAPID LIVELIHOODS ASSESSMENT

November 2005

Executive Summary

A rapid participatory assessment was conducted by an FAO Livelihoods Adviser in collaboration with the Department of Agriculture, Muzaffarabad, during the period 27 to 31 October 2005. Its objective was to provide some qualitative information on how the earthquake has affected people's lives and livelihoods. The survey was conducted in an area most affected by the earthquake, in Muzaffarabad and Bagh Districts. Baseline data from previous Participatory Rural Appraisals conducted in 1995 has been extensively used in this assessment.

A summary of the Agro-Ecological Zones (AEZs) shows that the area affected falls mainly within AEZ 2, although part of AEZ 1, the Lower Neelum Valley, is also affected. Characteristics of the zone and sub-zones are described. A description is made of how people made a living prior to the earthquake, and what they needed to sustain those livelihoods. The centrality of livestock, and in particular the buffalo, is highlighted.

In addition to loss of life, there has been a huge depletion in the assets and capital that people need to help them make a living – social, human, physical, natural and financial assets. Some of these losses are outlined and the implications analysed. Already there are signs that people are developing coping strategies to help fill these gaps, and some of these are described. Some case studies illustrate how lives and livelihoods have been devastated.

Section 9 deals with how livelihoods can best be supported at this crucial time. This is addressed through a description of priorities proposed by people themselves in recent surveys and interviews. They include drinking water, shelter for the family, shelter for livestock, work and income, food and fodder for winter, terrace and irrigation rehabilitation, seeds and fertiliser, and long-term loans.

Finally, Section 10 offers guidance for programmers, steps to ensure that people's livelihood priorities are met as rehabilitation measures are rolled out. These include recommendations in the following areas: (i) Targeting the poorest, (ii) Cash for work, (iii) Livestock enterprises, (iv) Livelihoods diversification and enterprise development, (v) Cropping: getting the land back into shape, (vi) Rural finance, and (vii) Migration.

1. Background

On 8 October 2005, an earthquake measuring 7.6 on the Richter scale, with its epicentre located at 19 km northeast of Muzaffarabad struck the northern areas of Pakistan and India. AJK and North West Frontier Province were severely affected. Since 8 October, nearly 80 aftershocks have been recorded in the region, some of them close to 6.0 on the Richter scale.

At the time of writing, an estimated death toll over 80,000 was reported, and is expected to rise further. Most buildings in the affected area had poor earthquake resilience. Seventy per cent of houses have been destroyed, and the remaining 30 per cent severely damaged. The latest estimates indicate that around 3.2-3.5 million people have been affected by the disaster, and are in need of assistance, including winterized shelter, heating, medical care, food, and water and sanitation facilities.

A rapid participatory assessment was conducted by an FAO Livelihoods Adviser in collaboration with the Department of Agriculture during the period 27 to 31 October 2005. Its objective was to provide some qualitative information on how the earthquake has affected people's lives and how they make a living. The survey looked at what resources people had lost, the coping strategies which they are adopting to deal with the current situation, and the outcomes that they seek to achieve when the immediate effects of the emergency are over.

The survey was conducted in one of the areas most affected by the earthquake. In Muzaffarabad District, the team initially surveyed a village on the slopes around Muzaffarabad city (Rajkandi), then moved up the Jhelum Valley towards Garhi Dopatta. Ascending into higher altitude areas, surveys were conducted in a number of villages in and around Chikar and Sudhan Gali (5,500 to 7000 feet above sea level). The team then moved into Bagh, and more were interviewed in Birpani, Dhulli and Nar Sher Ali Khan.

2. Sources of information

The PRA team of 5 used a mixture of Participatory Rural Appraisal (PRA) tools, mostly qualitative semi-structured focussed group interviews, and key informant interviews, and this information was triangulated with observations of what could be seen on the ground. A simple sampling frame was used, seeking villages with differing levels of damage at different altitudes. Extensive use has been made of a previous detailed PRA which had been conducted by the same team during 1995, and its associated report[1].

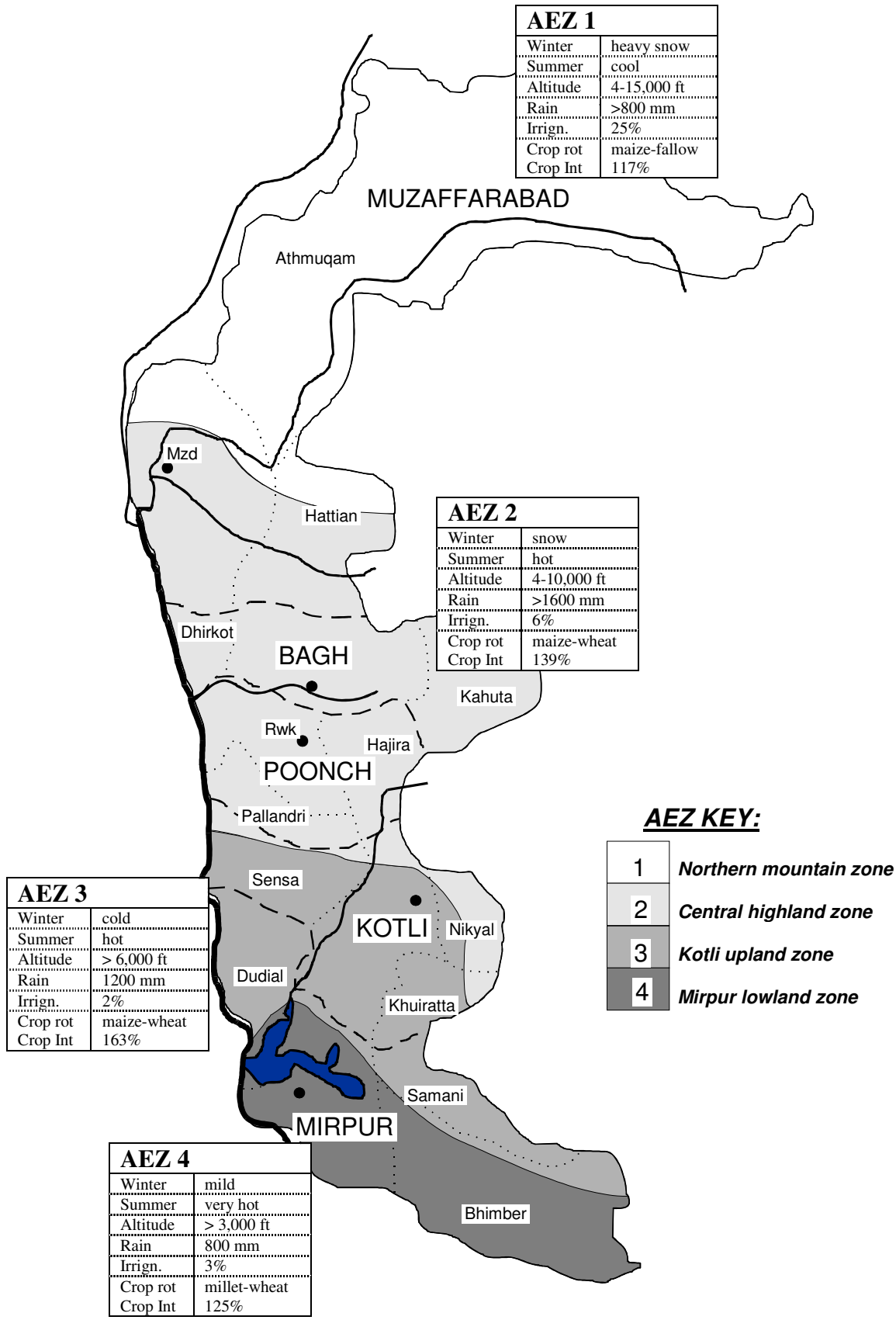
3. Description of the affected area

3.1 Agro-ecological summary

The agro-ecological map shows different zones. Agro-ecological Zone 2 (Central Highland Zone) was most affected by the earthquake, and this report focuses on this area. Communities in AEZ 1 are also affected by the earthquake. Serious shocks affected the Lower Neelum Valley. Upper parts of the AEZ, although much less affected by shocks, are now cut off by massive landslides in the Neelum Valley, which are unlikely to be cleared before winter.

[1] Participatory Diagnostic Rural Surveys, Dept Agric. Muzaffarabad Feb 1996

AGRO-ECOLOGICAL ZONE MAP OF AJK



There are also very distinct differences within AEZs due to climatic variation – particularly temperature - brought about by change in altitude, and three micro-ecological sub-zones are distinguished on the basis of altitude: above 5,000 ft, between 3,500 and 5,000 ft, and below 3,500 ft.

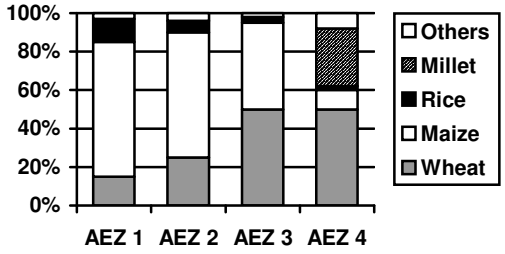
The climate of AEZ 2 is described as moist and temperate, with a winter duration of four months from December to April (AEZ 1, November to May). Altitude varies between 2000 to 9000 feet above sea level (up to 15,000 in AEZ 1), and winters at higher altitudes are harsh, with heavy snowfall (heavier and harsher in AEZ 1). Rainfall occurs throughout the year, with only 3 months below 75 mm, monsoonal summer rains, and a total annual rainfall of around 1600 mm (AEZ 1 has only 800mm, almost all in summer).

The population density in AEZ 2 is the highest in the whole of AJK, at around 700 people per square kilometre. AEZ 1 is much less densely populated, with less than 100 per square kilometre (AEZ 3: 500/km^2, AEZ 4: 450/km^2) . The largest town is Muzaffarabad, and urban populations are increasing. In rural areas the population is highly scattered and dispersed, with many dwellings and smallholdings widely distributed across the hills and valleys. Infrastructural development is weak.

3.2 Livelihoods

Agriculture is not only the dominant occupation for rural families, it is a way of life throughout the area, and the livelihoods of many people depend more or less entirely on farm and related activities. The average size of farm holding is small at around 1.5 acres, but farm size is decreasing with fragmentation through inheritance, and few farms can be considered economically viable from a purely agricultural perspective. In AJK, unlike in Pakistan where tenancy is common, there is a very high proportion of owner-operated farms, and around 85 per cent of rural householders own their own land. This proportion is even greater at high altitudes, with tenancy arrangements restricted to rice areas at lower altitude. This land tenure pattern goes a long way to explain why people are so reluctant to move elsewhere or to valley bottoms after the earthquake.

Cropped areas in AEZs of AJK



The prevailing cropping system is maize in summer (*kharif*) followed by wheat in winter (*rabi*). The most important crop is the summer maize crop, which is normally allowed to dry and stored for consumption over winter. It is grown as a dual purpose crop. High seedrates permit crop thinning which is used for green fodder, with subsequent grain harvest. Maize stover is an important winter dry fodder, with hay. Wheat is also grown as a dual purpose crop, with some cut for fodder, some for grain. At low altitudes much of the crop is able to mature into grain which is invariably used for domestic consumption. Higher up (>5000 ft) the crop is not able to mature and almost all is cut as animal fodder. Increasingly grain is preferred, with a growing preference for wheat as a staple. At lower altitudes and where irrigation permits, paddy rice is planted in *kharif* followed by a fodder crop in *rabi*, often a legume such as berseem and shaftal. Rape is usually intercropped with wheat, and pulses/beans with maize. Owing to long duration of main crops, there is great turn-around pressure between harvest of one crop and planting the next, especially at relatively high

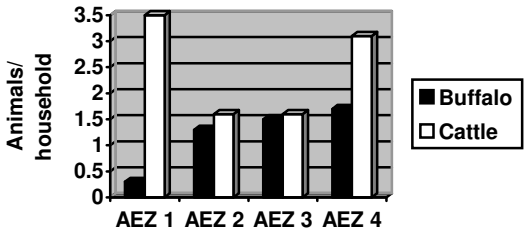
altitudes. An average annual cropping intensity of nearly 150 per cent is achieved (much less in AEZ 1). Average grain yields are around 1200 kg/ha for maize, just over 1000 kg/ha for wheat.

Irrigation covers less than 10 per cent of total agricultural land in AEZ 2 (over 25 per cent in AEZ 1), but yields are higher and total production significantly greater than this suggests. Much of this is comprised of the rice paddies at lower altitudes. Further up the slopes, irrigation is usually through small open irrigation channels tapped from natural springs and perennial nullas (streams). These channels sometimes run for long distances, and are maintained only with a high input of labour which is needed to mend frequent breaches, and unblock small slides caused by disturbances of various kinds. A lack of irrigation for crops is cited as being the main reason for adhering to traditional risk-averse cropping patterns, and not diversifying into more productive but higher risk systems.

Nearly 40 per cent of households have small orchards (nearly 70% in AEZ 1). Walnut is the major crop (mostly sold), followed by apple (mean 6 trees per household), apricot and pears, with soft fruits more important at lower altitudes. Some produce is sold, and much also stored for winter.

Livestock and especially buffalos represent a vital component of farming systems and livelihoods. On average over the whole area there is more than one buffalo per household, but many households have 2 or 3, and ownership is an aspiration of the large majority. The price of an improved Punjabi buffalo is around Rs.50,000, less (Rs.30,000) for the local 'desi' breed which is sometimes preferred at high altitudes since they are lighter and more mobile on steep slopes, and are considered more resilient to harsh conditions and diseases. The buffalo holds pride of place in the household, and is cared for with great attention. Much rural activity centres on its health and welfare. There are local 'vets', whose skills in diagnosing and curing various ailments are highly valued. The regime for feeding and watering, and for taking them out into the fresh air, is tightly controlled, usually by womenfolk. In return the buffalo provides milk for domestic consumption and sale, calves, and ultimately meat. In October milk yield is at its peak, and average yields can be as high as 10 to 12 litres a day for an improved Punjabi animal (5-6 for 'desi' animals). Priorities for use of the milk are firstly for nutrition of family – especially children. A second priority is for making tea for guests. Any remainder will be sold, and the price is currently around Rs.25 per litre. At higher altitudes where warmth is at a premium, livestock (along with much other agricultural paraphernalia) is housed at ground floor level in a 2 or 3 storey house, with family living above.

Buffalo and cattle numbers in AEZs of AJK



Cattle are also kept (average 1.5 per household), and milking animals may be given almost as much attention as the buffalo. Their price is lower, and the milk valued less. Bullocks are kept for draught, and this is particularly important in higher altitudes where terraces are very narrow, and where tractors are either unsuitable or unavailable. In AEZ 1 cattle numbers are much higher (3 to 4 per household), and buffalos are few (less than one). Most households almost invariably have some small ruminants, and backyard poultry which are often kept in cages.

Ensuring that sufficient stocks of animal fodder are laid in for the winter period is an enduring problem for livestock owners. They need to ensure that sufficient dried fodder and concentrate is stored. The concentrate ('khal', cottonseed cake) is imported from Punjab, as is much of the dried wheat straw ('bhusa'), and this has to be purchased in bulk. This is supplemented by whatever green fodder is available - berseem and wheat at lower altitudes. There are also tree species in the forest the leaves of which are cut for mixing with other feed (especially *Quercus*, *Melia*, and *Olea* species).

Regarding forests and forest lands, some 40 per cent of the total land area of AJK is described as such, but much of this is badly degraded, with indiscriminate deforestation that has led to heavy soil erosion. All but 1 per cent of this forest land is state-owned, and there is as a result no sense of ownership of the forest at community level, and protection is minimal or non-existent. People rely heavily on the forest to sustain their livelihoods, and there are over 30 species which provide people with timber for construction, fuelwood, and for making tools and implements. In addition there are many non-wood forest products widely used for a wide range of purposes including animal fodder, animal litter, resins, and fruits and berries for human consumption. Transhumant herders (Gujjars) also have access to these lands for grazing.

The landless: a comparatively small number of households are without agricultural land, and significant proportion of these are female headed. These households have sufficient space however to shelter and raise livestock, and usually have some vegetables and fruit in kitchen gardens. These households rely on sales of items produced or gathered, including forest products (milk, eggs, livestock, vegetables, firewood). They also have access to common forest lands (*shamlat*), but benefits from common forest lands are often captured more by non-poor groups.

Non-farm income sources: few families could be described as well-off, but those at the top end of the range typically have livelihoods enhanced by a number of possible external sources of income. Around 20 per cent of the best-off families receive remittances from members working overseas, sometimes in OPEC countries. Around 40 per cent have family members who are employed locally or in Pakistan. Many in this region have a son in the army, and some have a family member in government. Others work in service industries in Islamabad, Rawalpindi and beyond. The remaining 40 per cent of households rely entirely on farm and off-farm activities, and many of these also sell their labour either locally to larger farmers, or if they live near to a town into the urban employment market. A lack of employment opportunities is cited as one of the key problems facing those needing to supplement their livelihoods.

In terms of livelihood diversification, there are few income generating activities in evidence in rural areas, and in particular women lack the opportunity, know-how and resources to diversify their livelihoods. Low levels of female education aggravate this. The most often mentioned possibilities, with some examples of good practice, are bee-keeping, sericulture, fruit and vegetable preservation and marketing, expansion of existing livestock and poultry production, and kitchen gardening/vegetable production and marketing. People cite a lack of available credit as being a main constraint to diversifying their income and developing a new enterprise.

Main problems facing rural households; far and away the most commonly cited problem facing households in AEZ 2 is a lack of drinking water and proper sanitation. It is women who suffer most, having to spend many hours walking often long distances to fetch sufficient for daily household use. Poor health and education

services are the next most common issue. This is followed, particularly at high altitudes, by poor access. After this, there are a number of issues relating to agricultural production, including availability and quality of inputs, pests and diseases, shortage of fodder.

4. The effects of the earthquake; what people have lost

There has been a huge loss of life, above 80,000 at the time of going to press. Over 80% of this has been in AEZ 2. There has been a dramatic loss also in the resources to which people had access for making a living, prior to the earthquake. This depletion has occurred to social, human, financial, physical and natural assets, and some of these losses are described below.

4.1 Social capital and community cohesion

Social capital is about the strength of human relationships, and this is now under threat mainly from migration. Although people in this area are used to hardship and there is a high level of traditional resilience, this situation is unprecedented in living memory, and very few will have the capacity to manage without support from outside. This has affected all sectors of society, and the poorest and most marginalised groups have been some of the worst hit; when you have little to start with, any loss has a proportionally greater impact. There may be a further skew in impact on the poor with local 'kacha' houses being more badly affected. Social capital and community cohesion is threatened by migration, and the survival of the most vulnerable groups will rely to a large extent on the support of better-off elements of the community to protect them over the coming months.


Migration

The race for survival among communities at higher altitudes is on, and time is against them. Winter is fast approaching, and the first snows will arrive within the next two to three weeks. Some 20-30 per cent of the better-off elements of society have already migrated to lower areas. Of the remainder, another 50 per cent are currently seriously considering it, a hard and risky decision. All who are left would like to "stay put" if remotely possible. In a traumatised state of mind, they are trying to think of survival strategies. Moving everything that is left to an unknown destination is a truly daunting task - dependents, possessions, livestock, furniture, valuables - all would have to be transported. Hiring a truck costs Rs.8,000, a big expense, and a big risk. If they go to Rawalpindi for example they will "even have to buy water", let alone rent a house. Livelihoods would be seriously disrupted if they migrate. On top of this is the very real threat that anything left behind - including land – might be occupied by others while absent. In many cases this is aggravated either by an absence of legal land rights or documentation, or through the loss or destruction of these in the earthquake.

But the group of most concern is remaining 20 per cent who are too poor to move, and anyway have nowhere to go. This group is highly vulnerable, has no resources, and will rely on help from the community for protection and to enable it to survive (often female-headed households, newly widowed among these). These households are very concerned right now about security risks.

4.2 Natural and agricultural assets

For the rural population, natural assets have been worst hit. The earthquake has caused significant destabilisation of land and soil structure. Extensive cracks can be observed which run across slopes, deep into the subsoil. At the onset of rains and heavy winter weathering there is a strong likelihood of landslides which will hinder farm activities and block access.

Water supplies have been disrupted. Many natural springs have dried up, and water channels for irrigation have in the majority of cases been broken, become misaligned, or simply been blocked or wiped out by landslides. The source of drinking water both for humans and animals is threatened, and in addition irrigation supplies are decimated.

Landslides have reduced tree-cover, a contributory element to an already depleted landscape. Further deforestation can be expected, and stocks of wood for fuel and rebuilding will be built up before the onset of winter. This will further deplete forest resources.

There is substantial damage to terraces used for crop production (>20%). The painstaking work of years has been destroyed. In some cases deep cracks have formed which have caused splitting across terrace retaining walls. The walls themselves have often fallen and collapsed, frequently over long stretches. Land slippage has caused shifting of entire ledges of soil, creating entirely new terraces. The slope of the land has in some cases changed, giving rise to new slopes that on irrigated lands will require re-grading. Increasingly, terraces are being used to erect tents and other temporary shelters, further depleting the area available for immediate cultivation.

There has been a heavy toll on livestock. Estimated mortality in Bagh is 50% for cattle, 47% for buffalo - Muzaffarabad 21% and 29%. But this data hides a much worse situation at higher altitudes where more animals were inside local buildings which collapsed. A typical, strictly controlled regime for taking buffalos outside in October would be from around 10 am to 3 pm. More escaped at lower altitudes where the routine is nearer from 9 am to 5 pm. Many of those killed were housed in. In addition, animals grazing on steep hillsides simply fell off. Transhumant herders (Gujjars) and their flocks of sheep and goats also suffered heavy losses, and average goat and sheep losses are in the

order of 30%. Poultry also suffered, particularly commercial enterprises, with Muzaffarabad recording a 47% loss.

Fodder stocks are heavily depleted, with winter fodder (hay and bhusa, with khal concentrate) from Punjab destroyed in stores. The earthquake struck at peak time for cutting local grass for hay, which is stored in stacks and tree-shelters, and some of these have also gone. In general, it is unlikely that people will restock until next spring, when snows have gone and more adequate supplies of fodder are coming in.

Standing crops, particularly *kharif* maize, have been decimated since owners were unable to take adequate precautions in keeping off uncontrolled, free-roaming livestock (estimated 75% losses). In addition the crop was used as an immediate and timely source of food for owners and surrounding families. Rice harvest was also underway when the earthquake struck, and as a result the harvest has not been completed. This has led to shattering and grain loss which will increase with time, and official figures of 10% loss may underestimate reality. Although berseem and other green fodder crops have already been planted at lower altitudes, this is not the case higher up the slopes.

The last planting date for *rabi* season wheat is the end of November, and whilst at lower altitudes where tractors are available for cultivation there are already signs that cropping is underway, higher up the capacity to get a crop into the ground is much reduced, and it is unlikely that there will be much planting at all.

Most households have fruit trees, with a high proportion of soft fruits at lower altitudes. Losses to trees are in the order of 5%, but with greater affect at high altitudes where much of the fruit already harvested and in store was destroyed. That remaining has largely been consumed by affected families.

4.3 Physical assets

Physical capital includes physical infrastructures such as buildings, roads, bridges, power supplies, water and sanitation systems, and productive equipment; again these have been badly damaged. Buildings and shelter have often been reduced to rubble. Water and energy supplies have been cut off, and transport systems have been seriously threatened by unstable link roads, with the strong likelihood of further slides and worsening access as winter sets in.

Markets have in some cases been entirely destroyed, but small traders were already setting up stalls among the rubble. Produce from Rawalpindi – vegetables and other consumable items - was already reaching the comparatively remote areas around Sudhan Gali, business more or less as usual. Prices were only slightly above normal for the time of year. The price of meat was also normal despite the pending Eid festival, and butchers reported that there was a glut of meat since many livestock owners were selling animals which they would not be able to feed over winter.

No kind of housing escaped, and in worst affected areas human dwellings have been entirely destroyed. *Kacha* (traditional) houses with massive earth roofs fared worse. These buildings are characterised by extremely heavy roofs, formed from massive support timbers covered with two to three feet of earth. These structures, whilst providing excellent insulation against cold and snow, proved totally inadequate in withstanding seismic shock, and collapsed within seconds of the onset of the earthquake, crushing anything beneath it, animate or inanimate alike. At higher altitudes the better-off live often in two- or three-storey farmhouses - the ground floor is for animals, the first for family, and the third for guests. These '*pakka'* (improved) houses are built with stone or reinforced concrete, timber, and galvanised sheet roofs. They too collapsed, but with less loss of life.


Pakka


Kacha

There was also a huge loss of farm equipment, including at lower altitudes tractors and associated equipment. Animal draught is more important at higher altitudes, and bullock-drawn ploughs and other draught equipment is also lost. In addition, and hand-tools and implements, small hand operated or and electric-powered machinery, such as fodder-choppers (see photo) and post-harvest equipment will also need replacement.

4.4 Human capital

Human capital is above all human life, and this has sustained a huge loss across the area. It is also made up by health and nutrition, education, local skills and knowledge, and other human elements that help to make labour productive, and these have been devastated. Public health and education services have ground to a complete halt, with huge loss of life among pupils, patients and staff, and an almost total destruction of buildings and resources in these sectors. Health and nutrition are further threatened by a diminished and unbalanced diet in particular in less easily accessible rural areas.

As is the case with all people affected, artisanal and skilled labour is primarily occupied in coping with its own domestic problems. In addition many skilled and unskilled workers have already migrated to areas where there is easier work with more readily available money. Both the rural and urban labour markets are further weakened through a lack of cash and capacity to remunerate. Many tools, equipment and small machinery that are needed for productive work have been buried and destroyed.

4.5 Financial assets and personal possessions

There has been an enormous loss of people's personal possessions, with financial losses both to capital and income a part of this. Many cash deposits held at home have not yet been recovered, buried in the ruins of people's homes, often under tons of mud and rubble. Jewellery is another common means of saving, and this has suffered a similar fate. Other valuable personal possessions mentioned included books, poems, papers, documents, letters, and other memo*rabi*lia. In the wreckage also lie household effects such as beds, crockery, dowry, clothing and food. Of the latter, stocks were high in anticipation of the Eid festival.

For many rural people, the buffalo is a kind of 'bank', with substantial amounts of financial capital invested. High levels of livestock mortality have heavily depleted this capital. The regular source of income from sales of milk has also dried up. Milk yields of surviving buffalo were reported as being down by at least 50 per cent owing to cold and lack of shelter, and shortage of fodder and supplements. Improved livestock should provide 10 litres a day at this time of year, and at Rs.25 per litre, this represents a substantial loss of income. Sales of much other farm produce have suffered a similar fate, including sales of animals where prices are now much reduced, with buffalos being sold for meat.

5. Some devastated lives and livelihoods

Abdul Farooq comes from a village about 20 kms West of Muzaffarabad, up the Jhelum Valley in a village which lies at about 3,300 feet above sea level, close to the river and alongside a metalled road. This is one of the worst affected areas, and around 25% of the village population was killed in the earthquake - his family lost 2 close members.

His 'kacha' house has collapsed completely, and he himself was miraculously rescued from the ruins along with his 18 month-old son, 3 hours after the earthquake. All their possessions still lie in the wreckage, and they say it is still too dangerous to get possessions out. His brother tells us that for him the greatest loss is of some ancient hand-written religious scripts, from an ancestor who was a Sufi poet, which he considers 'more important than lives'.

Being at low altitude and with temperatures still quite warm, he had moved all of his 4 buffalos outside at around 8.30 that morning, some 30 minutes before the earthquake, and no animals were killed. The yield of buffalo milk however has since dropped to below 50% of normal, owing to lack of shelter and fodder. The main livelihood for the family is selling surplus milk at Muzaffarabad market, at this time of year around 20 or more litres a day, and this represents a loss of daily income of several hundred Rupees.

The kharif maize crop is still standing in the field, but no cobs are left having been eaten by untethered livestock or by the family themselves. He showed us some remaining wheat seed that should now be being planted for rabi, completely spoiled and sprouting after a heavy rain that fell the day after the earthquake. The rest of this he has fed to livestock.

The kitchen garden has been ruined by chickens and rodents. His small tools, implements and equipment such as mechanical fodder-chopper crushed under the huge weight of earth. Terraces are damaged, and the irrigation system is completely broken. Shelter is the family's biggest problem, and he wonders how they will manage over the coming winter.

Mohd Akbar lives in a village at high altitude - around 6000 feet - between Muzaffarabad and Bagh, again in one of the worst affected areas. This village is normally cut off for 2 months of the year by snowfall. The surrounding landscape is one of wreckage and destruction, with no house left standing. His sister and a daughter were killed in the earthquake, both being inside his house when it collapsed. His was a typical 3-story 'pakka' house, with animals kept on the ground floor. The house has collapsed like a pack of cards, and under the wreckage of timbers, earth and galvanised iron sheets his entire livestock assets were killed – 2 buffalos and 3 cows. All of the usual agricultural paraphernalia was on that floor with them. The family are living in makeshift tents and sheds, and the only drinking water comes now from a spring about a kilometre away.

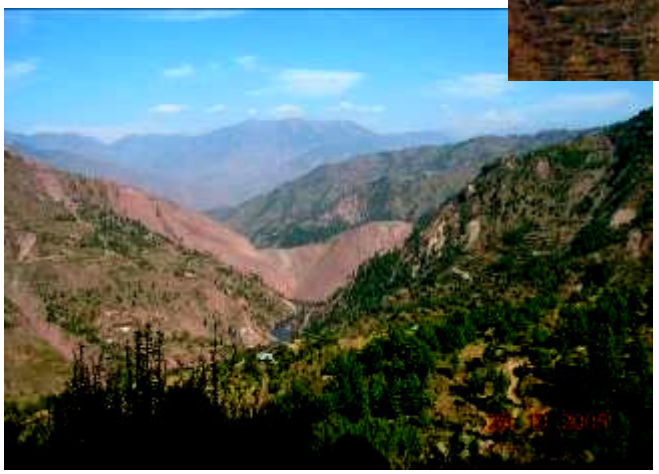
He owns about 1.5 acres of land. The terraces where he would normally now be planting wheat are hugely cracked and have become uneven, and it is hard to see how he will replant this season – it will need a lot of work and he does not feel he has the energy right now. Seeds for this rabi season are anyway lost in the ruins, as are tools and implements. Terrace walls have in places collapsed, and taken some apple trees with them.

The family wants desperately to stay put, but they recognise the difficulties that they face with imminent snows, and the certainly that they will be cut off by these as usual. Food stocks laid in for Eid were destroyed, and are wholly insufficient now for winter. Temporary shelter is wholly inadequate to deal with 5 feet of snow. They don't know how they will cope over the coming winter.

Arshad Begum was widowed some 10 years ago, and is around 70 years old. Her niece helps her around since she doesn't see so well these days. She comes from a village that lies at around 4000 feet, and which was very badly affected by the earthquake.

She had her own 'kacha' house which collapsed totally, and amazingly the only one hurt was her son who sustained a head injury. All her livestock were inside the house and were killed – a Punjabi cow and bull, and two calves. She is landless, and made her living from sales of small produce from her holding and from the forest – mainly from the milk, but also the odd chicken, and fuelwood. Her son, when he has recovered, also earns money selling his labour in the area.

She now faces a new threat. A massive landslide that wiped out two villages in its path, with a loss of life of around 1500 people, has blocked the river, and made a huge new earth dam. Water levels are rising fast, and her village lies within the new catchment area, and is likely to be under water before long.



No amount of machinery could shift this earth, and migration for the entire village will probably be necessary.

Her immediate livelihood priorities are food for the family, and shelter for them all. She has no idea how long it will take for the lake to fill, or where they will all be in a few weeks time.

Mohd Munir has tragically lost almost everything. He is 35 years old, and lives in a village above Muzaffarabad that looks down on it, at some 4,000 feet asl. That morning his wife and daughter were out on the steep hillsides with other women from the village, cutting grass for hay. There was a landslide under them and they all fell. Their bodies have not been recovered. His house and livestock shelter are unrecognisable as such, having slid down the hill, totally wrecked.

He also lost 2 buffalos in this slide, a cow and some goats. The family are landless. They made most of their income from sales of milk - this was mainly his wife and daughter's work. He himself was a local tailor, but his small shop and his sewing machine are completely destroyed.

He has lost all his savings, has no income, and little hope for the future at this point. He is just living from moment to moment right now, trying to cope with his loss. The family and friends are helping out.

6. Vulnerability factors

This area is prone to earthquake activity, lying in a belt where the likelihood of shocks is high. Soils are fragile, loose and unstable. This instability was further exacerbated by a high level of deforestation on unprotected bare slopes, a major contributory factor in the damage caused by landslides following the earthquake. All these factors combined to create a situation where the likelihood of heavy loss of life in the event of an earthquake was very high – an accident waiting to happen.

All agreed that they will never rebuild houses with the same design, recognising that the structures that they lived in were unsafe and responsible for a large proportion of the deaths that were recorded. Nobody realised how dangerous the houses were – in particular the kacha houses with massive timber and earth roofs. It appears that the last serious earthquake was in 1906, but this was not in living memory, and these structures had been built since then with resources which are locally and cheaply available. It will be a challenge to find a design of housing which keeps out the cold, withstands heavy snowfall, but is safe and economical to construct.

Households at high altitudes are more vulnerable than those lower down the slopes or in the valley bottom. This is as a result of a number of contributory factors, among them food insecurity, poor access with complete inaccessibility in winter, marginal soils, heavy winter snowfall and cold temperatures.

The most vulnerable are the poor, and this group is made up in the main by female headed households. Of these the poorest are landless. This group has been swelled by the deaths resulting from the earthquake, and the most recently widowed are especially at risk. Disability, including that caused from recent injury, is an additional cause of susceptibility.

There have been a series of strong aftershocks in the period since the earthquake, and these have led to a high level of nervousness in those still living in the area. A number of people in main towns have been killed in these, and the level of risk from dangerous structures in towns and rural areas alike is still very high. People are now reluctant to go inside buildings which have been damaged, and are unwilling to start to rebuild anything in case further shocks destroy their efforts. In addition to this, there is also a very high level of risk in rural areas from further landslides caused by destabilised soils and slopes.

7. The Role of Institutions

Government reacted quickly in the wake of the earthquake. The army was deployed immediately in relief efforts, despite serious losses to its own staff, and government machinery has played a key role in co-ordination of the various relief efforts. Local government within AJK and NWFP has itself been badly hit, with loss of life, property and personal effects, and this has reduced its capacity to respond to the needs of others; nonetheless it is getting back on its feet.

Many outside agencies - multilateral and bilateral - have been involved in relief efforts, among these the UN Agencies. WFP has played a prominent role in providing food. One key element in this crisis is that there is a continued need for food supply to areas particularly at high altitudes which are either cut off by landslides, or are about to become so when snowfall arrives. These communities are likely to remain dependent and cut off until next spring, requiring continued supplies of food.

As efforts evolve from a focus on immediate relief to rehabilitation and longer-term development, different agencies will begin to play a more prominent role. Key among these will be the development banks, which will be needed to inject funding into rebuilding lives and livelihoods. The World Bank and Asian Development Bank have already started work in this quarter. Bilateral agencies can be expected to support these efforts, all of which can be expected to support government's own efforts.

NGOs, CBOs and people's organisations and institutions will probably play the most important role in the rebuilding work, having the clearest understanding of what it will take to rebuild the livelihoods of poor people. There are a considerable number of these, and they are active in many areas. Prominent among NGOs is the Rural Support Network, which links together a number of Rural Support Programmes active in certain districts of NWFP and AJK. Since all development work will of necessity be people-centred and participatory in nature, these organisations will be crucial in the longer-term rebuilding work.

8. How people are managing; coping strategies

Many people spoken to were not planning ahead too far, seeking only to meet the requirements of the day. Others were starting to look ahead and plan for the future, and for many the prospects are bleak. Some will leave the area and never return - there will be a small proportion of the population that has either lost too much, or who are so severely traumatised, that they will seek other livelihoods elsewhere. This however is a radical household strategy which can only be adopted by those who have somewhere to go, and the resources to enable them to do so. Many others are considering this policy as winter approaches, and maybe up to 50 per cent of the population at higher altitudes will be forced to migrate either to tented camps or other accommodation if sufficient support by way of food and shelter is not provided.

Shelter is the primary concern of all who have lost houses, and all who are able are now actively putting together makeshift arrangements to protect family from the elements, with the weather getting colder by the day. Where tents are available these are being used, and use is being made of any available pieces of sheeting or canvas. Timber and other useable building material are being salvaged from the ruins, and temporary housing is being erected.

Makeshift shelter is also being put together for animals, especially for buffalos, and in cases it appeared that buffalos were getting precedence over humans. Housing for livestock will also be different in future, and the very high mortality in particular to buffalos and cows will have provided a hard lesson for livestock owners. The earthquake will cause a radical reshaping of livestock shelter as households seek to build alternative kinds of

shelter which will meet their needs and also be able to withstand any future shocks.

Where people have the resources, and where land has not been spoiled, cultivation for *rabi* season crops has begun. This is particularly evident in low-lying areas, and where access by tractors is possible. There is also some evidence that levelling of small areas for kitchen gardens is taking place, and planting of winter vegetables.

Animals are being sold, and destocking is one strategy being reluctantly employed by households who have lost stocks of fodder and who cannot see how to feed their animals over the winter period. There are also widespread reports of people slaughtering animals for immediate food purposes, where hunger and a lack of other supplies force radical action.

Crops which were either ready for harvest, or where harvest had already started, have been consumed for immediate food use. This includes in particular the maize crop, also rice and orchard crops such as apples. The harvest from these crops would normally be stored for use during the winter, and the result of this strategy will be that stored food stocks will be seriously depleted, and insufficient for the winter period.

9. What can be done to support livelihoods?

The priority needs that were expressed by people after the earthquake were clear, although there were of course some differences depending on individual and community circumstances. Broadly prioritised, these are outlined below:

1. Drinking water. Many natural springs that people rely on have dried up after the earthquake, and many piped supplies have been broken or disrupted by slides. This will require resources to get local artisans active in repairing and maintaining supply.
2. Food for winter. Immediate food shortage is an issue of utmost urgency for communities cut off by landslides, but these were not surveyed in the PRA. Areas visited were on an accessible road, and there was little visible immediate food shortage, and markets were open in main villages and towns, with traders re-opening for business even among the rubble. However, people are conscious that winter is approaching and that they need to stock up before that.
3. Shelter, fuel and utensils for family. Winter is fast approaching, and snow will start falling soon on higher ground. Temporary shelter is wholly inadequate. People almost universally said that they needed galvanised iron sheets first and foremost. There was enough timber around to construct frames for shelters. One NGO was observed around Bagh distributing these free of cost. Whatever can be constructed prior to winter will inevitably be scanty, and there will be a need of additional blankets and bedding. There will be a strong demand for fuel for heating, cooking and lighting, and whatever additional can be provided will reduce the inevitable use of the forest for this purpose.
4. Shelter and fodder for livestock especially buffalos. Keeping remaining buffalos alive and well will ensure that nutrition is maintained and that future livelihoods are more assured. Again, galvanised iron sheeting is the primary need. Vaccines and other drugs will be required also. Animals will require additional fodder to keep up their body temperatures; stocks of the normal diet (a mix of cottonseed concentrate and wheat straw) are heavily depleted and will need to be imported from Punjab. There was already some evidence of a secondary wave of livestock death owing to exposure, and this will accelerate rapidly with onset of winter.

5. Work and income. Cash is in desperately short supply, and people need work to bring in enough money to meet immediate needs, and also to start to stock up for winter months ahead. At present there is little work available, either in towns or villages, and certainly none in rural areas. Cash for work, for example for clearing rubble or for people's own asset recovery, would help to fill this need.
6. Land levelling and irrigation rehabilitation. There has been some serious damage to terraces and terrace walls, and in instances this will be too bad to be re-levelled by hand. Some may be reclaimed using tractor-mounted graders, other instances will require heavier road graders. The main thrust of this activity will need to be aimed at getting the next *kharif* crop into the ground, as there is insufficient time now for major levelling before wheat planting, and farmers will plant for *rabi* as best they can. Land preparation for *kharif* takes place in May for planting in June. Irrigation channels need also to be rehabilitated before the next *kharif* season.
7. Seeds and fertiliser for *rabi* season. Seed and fertiliser for planting wheat and berseem in the imminent (or even overdue) *rabi* season were in many cases destroyed, and immediate supply will ensure that where it is possible to plant, farmers will have access to adequate inputs to enable them to plant. Attention should be paid where possible to getting varieties suitable for fodder purposes to high altitude areas.
8. Loans for replenishing livestock and other agricultural equipment. The majority of households stated a preferred need for credit rather than direct replacement, but they felt that this should be interest-free. They felt that they knew best what they needed, that they knew where to go and get it, and at an appropriate time. Restocking with buffalos was the most cited need for loans (Rs.100,000 for 2 buffalos something of a 'norm'). Most interviewed would buy improved Punjabi types, and given lack of shelter and winter fodder they would not restock until April/May/June.

A proposed timeline for interventions is outlined below.

Requirement	**Deadlines and duration by month**											
Drinking water supply/rehabilitation												
Food for winter												
Shelter and fuel (human)												
Shelter and fuel (livestock)												
Work and income												
Land levelling/irrigation rehab												
Seeds and fertiliser (*rabi*, wheat)												
Seeds and fertiliser (*kharif*, maize)												
Loans (rural finance)												
Livelihoods diversification												
	N	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**

10. Livelihood priorities: Issues and implications for programmers

There are a number of key areas where programmers can focus, and where livelihoods can be regenerated more quickly and more substantially in so doing. These are outlined below.

Targeting the poorest

Whatever initiatives are taken to help regenerate livelihoods, there needs to be a process of selective targeting to ensure the equitable distribution of any benefits coming into the system. The livelihoods of the poorest have been those most hard hit by the earthquake, and they need to be the first to benefit from any rehabilitation work. This will not happen automatically, and assisted by NGOs a focused and explicit social and poverty mapping exercise would help to pinpoint with more accuracy where these people are to be found, as it is not clear that this information exists at present. This should be conducted as soon as possible.

Cash and food for work (CFW, FFW)

There is an acute shortage of work and food at the moment, at a time when people have dire needs not only to feed themselves and their families, but also to start to rebuild their homes and lives. Cash for work schemes can start to provide a source of cash to enable them to do this, but this only targets the able-bodied poor, and the poorest who are not able-bodied may need food aid with no expectation of work. There is a huge amount of work that needs to be carried out to rebuild the infrastructure; roads, bridges, culverts, buildings. Initially this may involve clearing rubble, and this is a very necessary early component before rebuilding can commence. Food or cash for asset recovery should be considered, supporting people while they clear their own rubble and rebuild temporary shelter. The CFW and FFW programmes should be kept going over the entire winter period. If CFW wage levels are set at the official minimum wage the poorest may get crowded out, and attention should be paid to balancing levels to ensure equitable distribution.

Livestock enterprises

Keeping remaining buffalos and other livestock alive over the coming winter should be a high priority. At present they have no shelter, and nights are getting colder. In particular improved Punjabi buffalos will not be able to survive the harsh AJK winter, and will die if adequate provision for their protection cannot be made. They will need fodder. Most important is an adequate supply of wheat straw (bhusa) and khal (cottonseed concentrate), both of which are normally imported from Punjab. For green fodder, wheat and berseem seed will be required, and planting time is now, in November.

Livelihoods diversification

In 1995 when first PRAs were conducted it was noted that there was a real scarcity of resources in AJK to provide opportunities for people to develop alternative income generating activities. Not much has changed since then. Women in particular stand to benefit from initiatives designed to facilitate this. Examples of successful enterprise development noted then were bee-keeping, sericulture, fruit and vegetable preservation and marketing, expansion of existing livestock and poultry production enterprises including milk processing units, and kitchen gardening/vegetable marketing. Capacity building and skill enhancement is needed in masonry, word-work, house-building, welding, and plumbing. Financing in this area can facilitate the process of developing and expanding skills and enterprises.

Cropping: getting the land back into shape

The first steps to be taken are to get the land back into good shape in particular for next year's *kharif* maize crop. This will involve land levelling, some of which can be

done with tractor-graders, but some of which will require heavy equipment where serious land movement has occurred. Terrace walls also need to be rebuilt where they have collapsed. Farmers cite a lack of irrigation, and a lack of timely and good quality inputs and advice, as being key reasons why they adhere to traditional, low-risk cropping patterns and varieties. Certainly higher yielding varieties exist than those currently in use. Efforts to get researchers out in the field working with farmers on potential improvements in participatory technology development should pay dividends.

Rural finance

There has been an enormous depletion of capital, and none the least of these through livestock mortality. For example where 2 buffalos have been killed, this represents a loss in capital of Rs.100,000. The estimated cost of destroyed buildings and equipment further adds to the loss. It is going to require a massive effort on the part of those concerned to rebuild their assets, and the injection of capital in the form of loans is going to be one of the most strategic ways of getting this process underway. Loans should come with a minimum of administrative burden, and should be very soft if not interest free - the Department already has some experience of this in the livestock and poultry sub-sectors. Loans should be in the form of a one-off cash transfer to allow households to invest as they think best - where markets are working well they are likely to spend wisely and are the best judge of how to invest.

Migration

There is a need for further research on migration. Estimates gathered during this survey suggested that up to 40% of the population may have migrated from some areas, and although this would appear to have captured a real trend, its extent and nature is not known. Further work to establish who has migrated and to where, and the extent to which this is temporary or permanent, would help in planning and inform future decision making.

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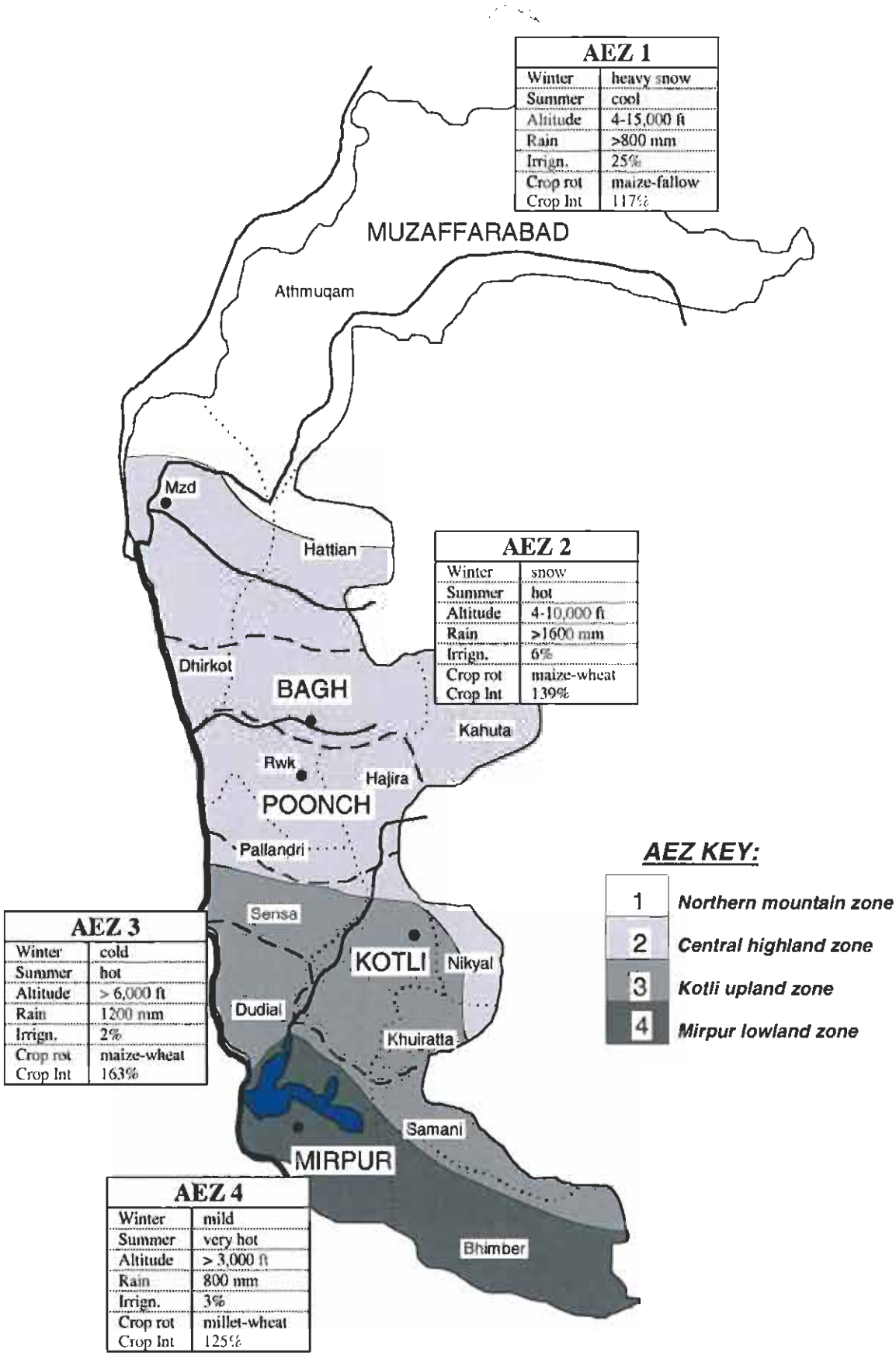
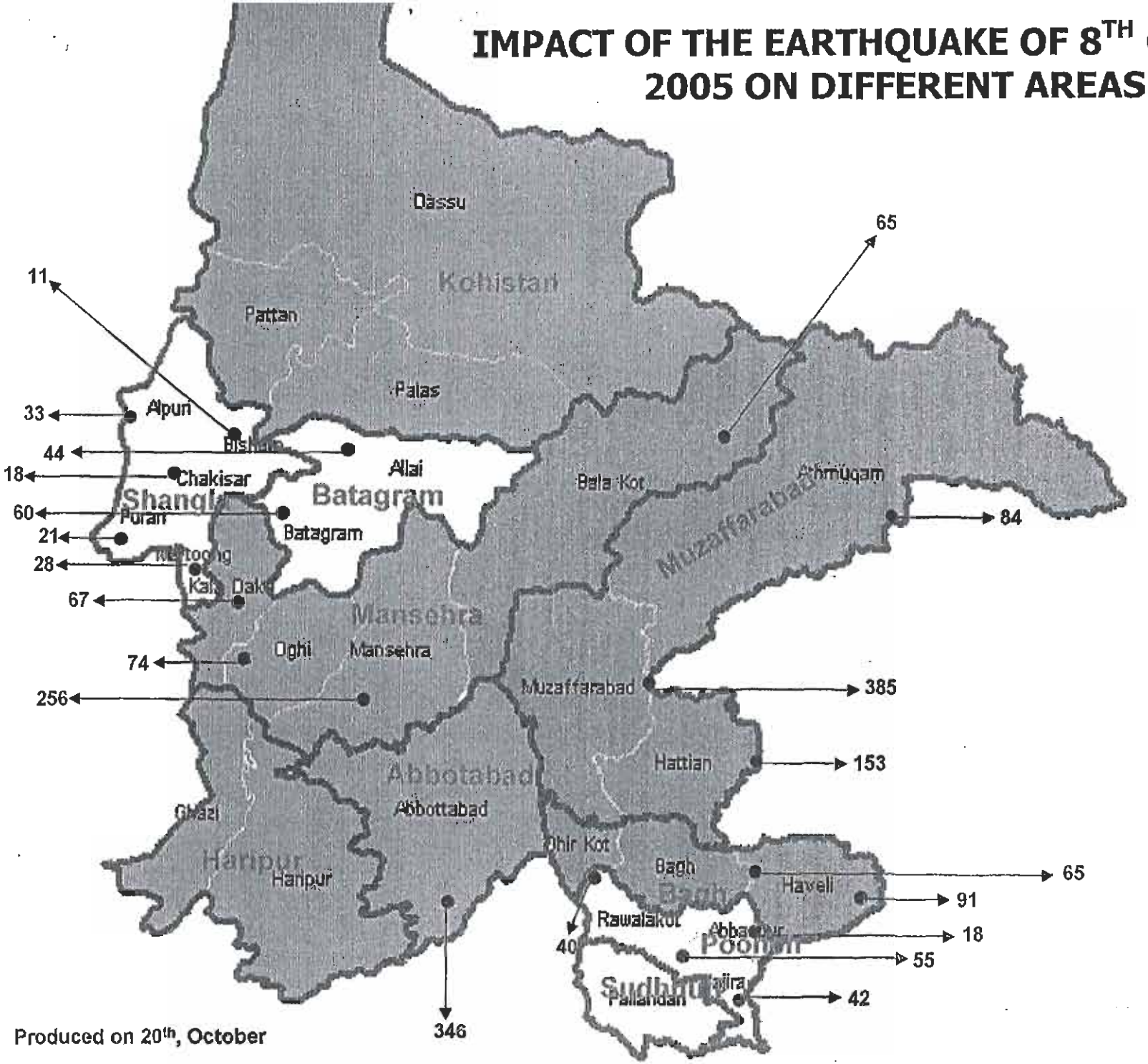
ANNEX 6

MAPS

AGRO-ECOLOGICAL ZONE MAP OF AJK



IMPACT OF THE EARTHQUAKE OF 8TH OCTOBER 2005 ON DIFFERENT AREAS



TEHSIL	Affected Propotion
Dhir Kot	80
Haveli	80
Bagh	80
Hattian	90
Muzaffarabad	90
Athmuqam	90
Rawalakot	60
Hajira	50
Abbaspur	80
Abbottabad	20
Batagram	60
Allai	60
F. R Kala Dhaka	50
Oghi	30
Mansehra	30
Bala Kot	90
Martoong	50
Puran	50
Alpuri	50
Chakisar	50
Bisham	50

≤ 40 %
41-79 %
≥ 80 %

Produced on 20th, October

ANNEX 7

PRESENTATIONS MADE AT WORKSHOP HELD IN ISLAMABAD,

10TH NOVEMBER, 2005

Damage Assessment Work

- Damage assessment in five affected districts of NWFP
- Field Work (October 23-30, 2005)
- Assessment in collaboration with district Govt., Livestock and Agricultural Departments, NGOs, COs and Other Stakeholders
- Preliminary assessment results shared with MINFAL, NWFP Govt., Donors and UN agencies

Damage Assessment: Methods

- Close consultative process involving local officials, Community Organizations and interest groups
- Focus groups interviews were conducted using structured questionnaire
- Direct damages: animal mortality, animal sheds, forages, standing crops, grasslands, cultivated lands, fruit plants, multipurpose plants, farm storage
- Indirect damages: losses to milk productivity, inabilities to plant current rabi crops, future production losses from damaged land, fruit and multipurpose plants
- Damages were aggregated at district and provincia

Population of the Districts Affected by Earthquake

District	Area in sq km.	Estimated Population (millions)	Estimated population affected (millions)	% population affected
Mansehra	4579	1.32	0.37	28%
Battagram	1301	0.35	0.21	60%
Abbottabad	1967	0.98	0.15	15%
Shangla	1586	0.52	0.16	30%
Konistan	7492	0.48	0.05	10%
Total:	16925	3.7	0.94	25%

Crop Sector Damages

Sub-sectors	MAN	BAT	SHA	ABT	KOH
Terraced area	30%				
Fruit Tree	2%				
Multipurpose tree	2%				
Maize crop	50%	50%	35%	30%	30%
Rice crop	15%	15%	10%	7%	10%
Grasses	20%				
Wheat area	30%				
Research and Ext. buildings	46150 sq ft.				

Livestock Sector Damages

Sub-sectors	MAN	BAT	SHA	ABT	KOH
•Mortality					
•Cattle	20%	30%	6%	20%	10%
•Buffalo	30%	40%	10%	50%	10%
•Sheep/goat	3%	10%	10%	10%	20%
Animal sheds lost	25%	50%	10%	25%	50%
Animal productivity	25-75%				
LDD buildings	63875 sq ft.				

Irrigation Sub-sector Damages

Irrigation Infrastructure	Number	Damage
Water Channels- National Program	159	50%
Water Channels-World Bank	170	50%
Water tanks	45	50-60%

Damage Costs

Sub-sector	Direct Damages	Indirect Losses
Crop	• Crop losses in the field (Rs. 1,3001 m)	• Crop productivity losses (Rs. 183 m)
	•Agric. extension and research buildings damages/losses (Rs. 47 m)	•Agro-forestry trees (Rs. 296)
	•Field terraces damages (Rs. 34m)	•Communal lands
	•Land losses (Rs. 93 m)	

Damage Costs (cont--)

Sub-sector	Direct Damages	Indirect Losses
Livestock	•Animal mortality losses (Rs. 3012m)	•Animal productivity losses (Rs. 2,370m)
	•Animal shed damages/losses (Rs. 800m)	
	•Storage losses (feed, grain, inputs) (Rs. 326m)	
	•Livestock and dairy development buildings damages/losses (Rs. 64m)	
Irrigation	•Irrigation infrastructure damages (Rs. 76m)	•Reduced capacity

Losses and Reconstruction Cost (Rs. Millions)

Sub-sectors	Direct Damages	Indirect Losses	Total Losses	Reconstruction Cost
Livestock	3,877.5	2,370.0	6,247.5	8,660.2
Crop	1,300.7	182.8	1,483.5	1,408.4
Irrigation	76.2	-	76.2	114.3
Total	5,254.4	2,552.8	7,807.2	10,182.9

Crop Sector Damages Summary

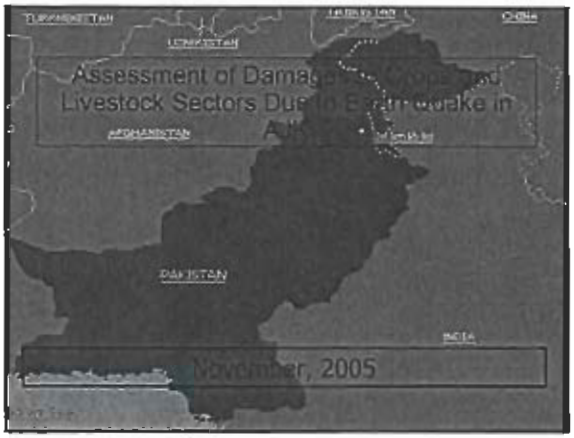
- Maize and rice crops on irrigated and rainfed lands damaged
- Inputs for winter crops not available
- Wheat and vegetables crops plantation in doubt
- Severe cracks in cultivated lands and terraces happened
- On-farm irrigation infrastructure badly damaged

Summary of Damages to Livestock

- High mortality of animals due to collapsed shelter
- No access to Shelter would cause reduction in productivity, high incidence of diseases and further mortality
- Chances of Respiratory diseases and HS outbreak
- Farm forage resources depleted drastically
- Limited affordability to buy feed supplements, wheat Bhusa and green fodder
- Fodder crop would not grown
- Drastic reduction in milk production(25%-75%)
- Animal selling and culling increased
- Animals are being sold at very low prices

Need Assessment

Immediate	Rank
– Animal Shelter	1
– Inputs for wheat and vegetable sowing	1
– Provision of tractor services	1
– Supply of feed supplements	2
– Supply of Poultry units	3
Medium/long-term	
– Agricultural offices infrastructure	1
– Improved Animal shelter	1
– Irrigation infrastructure	1
– Inputs for next maize crop	1
– Inputs for next vegetable crops	1
– Field terraces	2



Damage Assessment Work

- Damage assessment in three worse affected districts of AJK
- Field Work (October 21-30, 2005)
- Assessment in collaboration with Livestock and Agricultural Departments, NGOs, COs and Other Stakeholders
- Preliminary assessment results sharing with MINFAL and AJK Govt., Donors and UN agencies

Damage Assessment: Methods

- Close consultative process involving local officials, Community Organizations and interest groups
- Focus groups interviews were conducted using semi-structured questionnaire
- Direct damages: animal mortality, animal sheds, forages, standing crops, grasslands, cultivated lands, fruit plants, multipurpose plants, farm storage
- Indirect damages: losses to milk productivity, inabilities to plant current rabi crops, future production losses from damaged land, fruit and multipurpose plants
- Damages were aggregated at district, provincial and state levels

Crop Sector Damages

Sub-sectors	BAG	MA	POON
Terraced area	20%	20%	5%
Fruit Trees	5%		
Multipurpose trees	2%		
Maize crop	75%		
Rice crop	30%		
Grasses	30%		
Wheat area	50%		
Research and Ext. buildings	457,749 sq ft		

Livestock Sector Damages

Sub-sectors	BAG	MA	POON
Mortality			
-Cattle	50%	21%	12%
-Buffalo	47%	29%	2%
-Sheep/goat	28%	23%	3%
Animal sheds lost	95%	95%	46%
Animal productivity	25-75%		
Livestock and Dairy Development buildings	461,700 sq ft		

Irrigation Sub-sector Damages

Irrigation Infrastructure	% Damages
Water Channels	50
Diversions	50
Water lifting devices	25
Water spillways	100
Water tanks	100

Damage Costs

Sub-sector	Direct Damages	Indirect Losses
Crop	• Crop losses in the field (Rs. 4,325m)	• Crop productivity losses (Rs.301m)
	•Agric. extension and research buildings damages/losses (Rs. 458m)	•Agro-forestry trees (Rs. 357m)
	•Field terraces damages (Rs. 90m)	•Communal lands
	•Land losses (Rs. 132m)	

Damage Costs (cont--)

Sub-sector	Direct Damages	Indirect Losses
Livestock	•Animal mortality losses (Rs. 4,658m)	•Animal productivity losses (Rs. 3,600m)
	•Animal shed damages/losses (Rs. 3,142m)	
	•Storage losses (feed, grain, inputs)	
	•Livestock and dairy development buildings damages/losses (Rs. 462m)	
Irrigation	•Irrigation infrastructure damages (Rs. 240m)	•Reduced capacity

Losses and Reconstruction Cost (Rs. Millions)

Sub-sectors	Direct Damages	Indirect Losses	Total Losses	Reconstruction Cost
Livestock	8,261.4	3,600.4	11,861.8	12,715.2
Crop	4,325.2	300.8	4,626.0	3,536.5
Irrigation	240.0	-	240.0	360.0
Total	12,826.6	3,901.2	16,727.8	16,611.7

Crop Sector Damages Summary

- Standing mature maize and rice crops badly damaged
- Grasses were not fully harvested
- Maize stalk availability reduced drastically (75%)
- Tractor services and inputs for winter crops not available
- Winter wheat and vegetables could not be planted
- Cracks in cultivated lands and damages to terraces are future threats
- On-farm irrigation infrastructure badly damaged

Summary of Damages to Livestock

- High mortality of animals due to collapsed shelter
- No access to Shelter would cause further mortality
- Farm forage resources depleted drastically
- Limited affordability to buy feed supplements, wheat Bhusa and green fodder
- Specialized fodder crop are not grown
- Chances of Respiratory diseases and HS outbreak
- Milk production reduced drastically (75%)
- Animal selling and culling increased
- Animals are being sold at much lower prices

Need Assessment

Immediate	Rank
– Animal Shelter	1
– Inputs for wheat and vegetable sowing	1
– Provision of tractor services	1
– Supply of feed supplements	2
– Supply of Rural Poultry	3
Medium/long-term	
– Agricultural offices Infrastructure	1
– Irrigation infrastructure	1
– Nexd Maize and vegetable crops	1
– Field terraces	2
– Improved Animal shelter	1

Early Recovery, Rehabilitation and Reconstruction Programme for the Regeneration of Livelihoods in the Agriculture and Livestock Sector

4. Main Components

I. Rebuilding Agriculture and Rural Livelihoods

II. Rehabilitation and Improvement of Support Services

III. Coordination and Monitoring & Evaluation

I. Rebuilding Agriculture and Rural Livelihoods

1. Recovery and Improvement of farm production systems

- Livestock
- Crops
- Agro-forestry
- Irrigation and other on-farm productive infrastructure

I. Rebuilding Agriculture and Rural Livelihoods

2. Development and support of community-based activities

- Mobilization and strengthening of capacities of existing CBOs
- Development of community lands (grazing, forest lands)
- Rehabilitation of community irrigation
- Rehabilitation of other community infrastructure

I. Rebuilding Agriculture and Rural Livelihoods

3. Targeted support to improve livelihoods of vulnerable groups

- Conduct participatory livelihoods and needs analysis
- Distribution of livestock to landless
- Other targeted interventions

I. Rebuilding Agriculture and Rural Livelihoods

4. Livelihoods Diversification

- Promote new economic activities
- Strengthen market linkages
- Promote local value-addition

II. Rehabilitation and Improvement of Support Services

1. Rehabilitation of public infrastructures
- Rehabilitate Department of Agriculture and Livestock infrastructure
- Rehabilitate public irrigation infrastructure

II. Rehabilitation and Improvement of Support Services

2. Participatory evaluation and promotion of new technologies
- Validation of appropriate new technologies
- Pilot testing and evaluation
- Upscaling

II. Rehabilitation and Improvement of Support Services

3. Improvement of support services
- Strengthen public-private partnerships for service delivery
- Creation of producers/traders associations
- Facilitate private sector service delivery
- Improve rural finance services

II. Rehabilitation and Improvement of Support Services

4. Re-establishment of land and property rights

III. Coordination and Monitoring & Evaluation

5. Phasing and Indicative Programme Costs

I. Immediate Early Recovery (up to six months)

II. Short-term Rehabilitation (6 to 18 months)

III. Medium to Long-term Reconstruction and Development (five to ten years)


RECONSTRUCTION
HAS
STARTED !!!
THANK YOU FOR YOUR
ASSISTANCE !

ANNEX 8

DETAILED PROGRAMME PROPOSALS FROM AJK AND NWFP

ANNEX 8

DETAILED PROGRAMME PROPOSALS FROM AJK AND NWFP

Background

1. An earthquake of violent intensity was recorded by the Seismological network of Pakistan Meteorological Department on 8th October 2005. According to the preliminary analysis of the Meteorological Station Peshawar the earthquake originated at 08 hrs 51 minutes Pakistan Standard Time and its epicenter lie at 34.4 N, 73.6 E. The magnitude of the earthquake on international Richter scale was 7.6. The earthquake caused widespread destruction in North Pakistan. The quake triggered landslides, burying entire villages and roads in many areas.

2. Along with a roughly a 100 thousand human casualties livestock also suffered great losses. The residents of these mountains have primary dependency on livestock production providing the residents food, manure, draught power and cash through sale of livestock and livestock products. During the early recovery phase, along with human shelter the livestock shelter also got a blow and most of the animal houses got destroyed. Provision of shelter to livestock particularly in high altitude areas is the primary priority of the affected population. Traditionally feed for winter scarcity is obtained from hay harvest and crop residues mainly maize stalks and wheat straw. The quake occurred at a critical season, when the local farmers were busy in hay harvest and maize harvest. The grasses and maize were either not so far harvested or stored at the time of devastation. Those not intending to migrate from their habitat hence face severe shortage of stored feed to keep their animal alive. Such feed is needed to be purchased from the market and would hence need temporary tent stores at different nucleus points. In addition for the available feed stores are not available, hence will remain exposed to leaching and bleaching leading to nutrient losses. The need would be to provide plastic cover sheets to protect that what is available from leaching and bleaching. Most of the available chopping machines that served to chop mainly the maize stalks have been destroyed during the quake and the farmers are not able to effectively use the available maize stalk for feeding livestock. This necessitates provision of chopping machine on emergency basis at least one machine per village. Due to emergency cash need complemented by the approaching feed scarce winter season, the people are also selling the remaining livestock at prices well below the normal rates leading to de-stocking. Along with re-stocking particularly for the severely affected inhabitants, arrangement of feed for winter will facilitate the local to refrain from selling their only retained asset after the quake. The feed scarcity, approaching cool season and lack of shelter are complementary factors that predispose animals to deficiency diseases, outbreaks and worm infestation. Also a large number of animals have got injuries that are needed to be treated to avoid further economical losses to the already suffered population. This necessitates provision of veterinary cure, de-worming and vaccination to be provided at the door step of the affected households initially free of cost and then subsidized. Most of the veterinary hospitals, dispensaries and centers infrastructure has been vanished or is unusable. To meet the emergency demand for providing tented veterinary health care centers supported by mobile veterinary services for in the marginal annexed valleys. The terrain of the area is such that there will be still marginal population residing in the remote hamlets that would not be covered through the mobile facilities. In such areas auxiliary workers would needed to be trained in vaccination, de-worming and first aid to livestock, so that effective veterinary health care services could be extended to the affected population.

3. For the short term rehabilitation phase in livestock sector the need would be to demonstrate quake resistant affordable livestock houses that could be further replicated by the farmers themselves. During this phase re-construction of the veterinary extension centers would needed to be completed and these are needed to be strengthened through provision of surgical and diagnostic tools to effectively respond to the rehabilitation needs. A program to distribute, pregnant or lactating cattle, buffaloes and goats provision to the most affected household on first calf/kid return basis will be initiated. The calves and kids obtained will be subsequently provided to other similar households on similar terms and conditions. This will lead to effective livestock re-stocking in the quake affected areas. Similarly provision of poultry units comprising of four hens and one cockerel will contribute to economic empowerment as well as contribute to better nutrition of the children of affected population. A large quantity of milk is produced at the quake affected areas but can not be marketed due to its perishable nature and accessibility difficulties. As a result packed milk at two times higher prices are obtained in the urban centers of quake affected areas and the milk producers at mountains are compelled to process the surplus milk into milk products. To further complement the economic revival, during short term rehabilitation phase, both male and female farmer groups will needed to be trained in livestock product processing, management, breeding and marketing.

4. During the medium and long term rehabilitation phase emphasis will be given to pasture, rangeland and grassland improvement through re-seeding of the degraded slopes. This will improve the feed producing potentials of the local environment in sustainable and environmental friendly manner. Also emphasis will needed to be given on breed improvement through provision of elite rams, bucks and bulls for breeding purposes and development of location specific breed at the already existing livestock experiment station Jabba at Mansehra, for which its damaged infrastructure would needed to be re-built. Similarly mechanism would needed to be evolved for rectifying mineral and other nutrient deficiency through research based development of mineral supplement initially to be provided on subsidized rates and subsequently on cost recovery basis and training of the communities to formulate such supplements by themselves. In addition facilitation of milk processing unit through public private partnership will lead to efficient consumption of the locally produced milk and will play role in revival of the local economy. The available livestock markets have no facilities for watering, feeding, vaccination, shade and loading unloading facilities and these serve as revenue generation activities for urban municipal services at the cost of rural produce. This limits the bargaining power of the livestock sellers and livestock brought to the market are sold out with benefit to the purchaser. Such facilities are needed to be provided to improve the livestock marketing system and the bargaining power of the livestock producer. During the medium and long term rehabilitation phase introduction and extension of insurance scheme initially for milking buffaloes and subsequently for large sheep and goat herds will provide a sustainable strategy for long term livestock health management.

5. The rehabilitation program will be implemented through the following phases:

Criteria for distribution of Livestock related inputs and monitoring

A committee will be constituted at Union Council level comprising of:

- Nazim Union Council – Chairman
- Veterinary Officer concerned

- Kissan Councilor
- Lady Councilor
- Rep. of Revenue Department
- Rep. of Farm Services Centre (where available).

The committee will ensure that animals are distributed amongst landless, poorest/widows.

District Agriculture Coordination Forum will monitor the activities of the committee. The forum will comprise of:

- Executive District Office (Agriculture) – Chairman
- District Livestock Officer
- Representative of District Council

The committee will be responsible to Secretary Agriculture and DCO concerned and will submit the progress on monthly basis.

Table 1a. Component 1: Rebuilding Agriculture and Rural Livelihoods Sectors
Cost Summary November 14, 2005

	Sub-component Main Activities/sub-activities	Unit Cost ("000")	Estimated Cost (million Rs.) Early Recovery 1-6 m	S-T Rehab. 6-18 m	M/L-T Reconstr. 18m-5Y	Total	Proposed Implementation Agency	Critical Supproting Agencies/Partners	On-going/Planned Interventions Potential Funding Sources
	1.1 Recovry and Improvement of Farm Production Systems								
	Crops								
i.	Improvement of Field Terraces (3000 ha.)	116	-	58	290	348	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB, IFAD
ii.	Construction of protection bunds (20000 m^3)	1.250	-	6.25	18.75	25	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB, IFAD
iii.	Provision of inputs (seed, fertilizers, weedicides) (580	10.267	69.050			69.05	DOA-AJK,	NGOs/CBOs	FAO, WFP, WB, USAID,
	Provision of inputs (seed, fertilizers, weedicides) (672	5.644		379.277	1137.83	1517.107	DOA-AJK,	NGOs/CBOs,	FAO, WFP, WB, USAID,
iv.	Financing for hiring farm machinary/mobilizing availability of farm machinary (8 hrs/ha - 5-6 ploughing +cultivation @ Rs.600 per hour) Covering an area of 9583 ha @ Rs. 4800/ha for early reovery. For short-term recovery and rehabilitation covering an area of 46000 ha for four crop nseasons @ Rs. 3200/ha	6.784	46	588.6	0	634.8	DOA-AJK,	NGOs/CBOs, Fis	FAO, WFP, WB, ADB, IFAD
v	Inputs for vegetables on commercial basis (Seed, Fertilizers, Pesticides) for 8000 ha	8.5		17	51	68	DOA-AJK,	NGOs/CBOs,	FAO, WFP, WB, USAID,
vi.	Provision of plastic tunnel technologies for vegetable and vegetable seedlings productions (13000 hh)	2		6	20	26	DOA-AJK, NGOs	NGOs/CBOs,	FAO, WFP, WB, USAID,
vii.	Inputs for fodder crops (seed, Fertilizers)	6.8		34	102	136	DOA-AJK,	NGOs/CBOs,	FAO, WFP, WB, USAID,
viii.	Promotion of pulses cultivation and provision of inputs	1.5		3	9	12	DOA-AJK,	NGOs/CBOs,	FAO, WFP, WB, USAID,
ix.	Rehabilitation of old and establishment of new fruit orchards (25-50 plants /orchards + fertilizer)	3	3	6	18	27	DOA-AJK, CBOs	NGOs/CBOs, Res. Statios NWFP, Private Sector	FAO, WFP, WB, USAID, IFAD, UNDP
x.	Establishment of fruit plant nurseries in public & private sector (2 nurseries in each district of 2 ha each)	500		6	18	24	DOA-AJK, CBOs	NGOs/CBOs, Res. Statios NWFP, Private Sector	FAO, WFP, WB, USAID, IFAD, UNDP
xi.	Evaluation and testing of available/appropriate research findings/technologies	LS		2	6	8	DOA-AJK,	NGOs/CBOs, ICARDA	FAO, ICARDA, WFP, WB, USAID, IFAD, UNDP
xii.	Establishment of floriculture nurseries (one in each dis	500		1.5	4.5	6	DOA-AJK,	NGOs/CBOs,	FAO, WFP, WB, USAID,
xiii.	Promotion of cut-flower cultivation incl: seed, fertilizer, land development (200 ha)	75		3.7	11.25	14.95	DOA-AJK, CBOs	NGOs/CBOs,	FAO, WFP, WB, USAID,
xiv.	Provision of plastic sheets for temorary storage of gra	LS	0.5	1		1.5	DOA-AJK,	NGOs/CBOs,	FAO, WFP, UNDP, USAID,
xv.	Promotion of potato and potato seed cultivation/production (500 ha)	80		8	32	40	DOA-AJK, CBOs, NGOs	NGOs/CBOs,	FAO, WFP, WB, USAID,
xvi.	Promotion of off-season vegetables (200 ha)	8.5		0.425	1.275	1.7	DOA-AJK, NGOs	NGOs/CBOs,	FAO, WFP, WB, USAID,
	Total		**118.550**	**1120.752**	**1719.605**	**2959.107**			

Table 1a. Component 1: Rebuilding Agricultuire and Rural Livelihoods Sectors

	Agro-forestry								
i.	Establishment/strengthening of forest plant nurseries (one nursery in each district of 2-3 ha each)	300		0.9	2.7	3.6	DOF-AJK	NGOs/CBOs,	FAO, WFP, WB, USAID,
ii.	provision, distribution and plantation of multipurpose forest trees (600,000 plants of various species- price /100 plants)	0.8	0.8	1.6	2.4	4.8	DOF-AJK	NGOs/CBOs,	FAO, WFP, WB, USAID,
	Total		**0.8**	**2.5**	**5.1**	**8.4**			
	Irrigation and other On-farm infrastructure								
i.	Installation of water lifting devices (150 No.)	175	4.375	8.75	13.125	26.25	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB
ii.	Construction of water channels (2000 Km, 1-4 cusecs	400	-	200	600	800	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB
iii.	Construction of Diversion water channels (50000 Rft)	0.02	-	0.4	0.6	1	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB
iv.	Construction of water harvesting structures (70 No.)	300	-	6	15	21	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB
v.	Ground water resistivity survey	LS	-	2	-	2	DOA/NGOs/CBOs	NGOs/CBOs	WFP/JBIC/ADB/WB
	Total		**4.375**	**217.15**	**628.725**	**850.250**			
	Total 1.1		**123.725**	**1340.402**	**2353.43**	**3817.757**			
	1.2 Development and support of community-based activities								
i	Mobilize and strengthen capacities of existing CBOs			250	250	500	DOA-AJK, NGOs	NGOs, CBOs	WFP/JBIC/ADB/WB
ii	Development of community lands (grazing, forest lands)			10	10	20	NGOs/DOA, DOF-AJK, CBOs	NGOs, CBOs	WFP/JBIC/ADB/WB, IFAD, DFID, USAID, FAO, UNDP
iii	Community Irrigation			300	400	700	CBOs/DOA-AJK	NGOs, CBOs	WFP/JBIC/ADB/WB, IFAD, FAO, UNDP
iv.	Social Mapping at village level								WFP/ADB/WB, IFAD, FAO, UNDP
	- Identification of existing social infrastructure	LS					DOA-AJK, NGOs	NGOs, CBOs	WFP/ADB/WB, IFAD, DFID, FAO, UNDP
	- Identification of potential activists where COs not fo	LS					DOA-AJK, NGOs	NGOs, CBOs	WFP/ADB/WB, IFAD, USAID, FAO, UNDP
	- listing of existing projects/interventions	LS		3		3	DOA-AJK, NGOs	NGOs, CBOs	WFP/ADB/WB, IFAD, USAID, FAO, UNDP
	- Reconstruction of at least one "Mosque" in each village as focal place for prayers as well as community interaction	LS		1		1	CBOs/NGOs, DOA-AJK	NGOs, CBOs	CBOs, WFP/, IFAD, FAO, UNDP
	Total 1.2		-	**564**	**660**	**1224**			
	1.3 Targeted support to improve livelihoods of vulnerable groups								
	Conduct participotory livelihoods and need analysis				50	50	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	Other targeted interventions								
	- Periodic diognostic surveys through PRA			15	20	35	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	Total 1.2			**15**	**70**	**85**			

Table 1a. Component 1: Rebuilding Agriculture and Rural Livelihoods Sectors

	1.4 Livelihoods diversification							
	Promote new economic activities							
	- Vegetable and potato seed production and processing (supply of 400 M.tons of certified/basic seed to growers)		12	12	36	60	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	- Kitchen gardening activities (packets for 180,000 hh in total in entire period)		16	12	24	52	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	- Homestead forest plant nurseries / purchase of plants from these nurseries (2% of the affected families) 2620 hh @ 10,000 per hh		26	26	52	104	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	- promotion of fish culture and rehabilitation/construction of fish ponds			5	10	15	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	[illegible] marketing (1000 ha each year)			85	255	340	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	Strengthen market linkages			10	10	20	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, IFAD, DFID, FAO, UNDP
	- Horticulture and cash crops								
	- Floriculture/cut-flower								
	- Seed storage								
	- New market places indentification and establishmnet			50	100	150			
	Promote local value addition								
	capacity building/skill enhancement/development			25	75	100	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, ICARDA IFAD, DFID, FAO, UNDP
	Total		**54**	**225**	**562**	**841**	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, ICARDA IFAD, DFID, FAO, UNDP
	Total Component - 1		**177.725**	**2144.4**	**3645.43**	**5967.757**			

Component 2: Rehabilitation and Improvement of Support Services

Sub-component / Main Activities/sub-activities	Unit Cost ("000")	Estimated Cost (million Rs.) Early Recovery 1-6 m	S-T Rehab. 6-18 m	M/L-T Reconstr. 18m-5Y	Total	Proposed Implementation Agency	Critical Supproting Agencies/Partners	On-going/Planned Interventions Potential Funding Sources
2.1 Rehabilitation of Public Service Facilities								
Rehabilitate Department of Agriculture Infrastructure (office buidings, training centres, laboratories, nurseries, research farm buildings, store buildings, implement			300	416.624	716.624	DOA, PWD-AJK	PWD-AJK, P&DD	JBIC/ADB/WB, WFP IFAD, DFID, FAO, UNDP
Rehabilitate public irrigation infrastructure			15	25	40	DOA-AJK, NGOs	NGOs, CBOs	JBIC/ADB/WB, WFP IFAD, DFID, FAO, UNDP
Provision of office/laboratories equipment, research equipment, field tools/implements, furniture & fixture, training equipment			20	30	50	DOA-AJK	FIs, P&DD,	JBIC/ADB/WB, WFP IFAD, DFID, FAO, UNDP
Total 2.1			**335**	**471.624**	**806.624**			
2.2 Participatory evaluation and promotion of new technologies								
Validation of appropriate new technologies			4	8	12	DOA-AJK,	PARC/NARC	ADB/WB, WFP, IFAD, ICARDA, FAO, UNDP
Pilot testing and evaluation			3	7	10	DOA-AJK,	PARC/NARC	ADB/WB, WFP IFAD, FAO, UNDP
upscaling			5	15	20	DOA-AJK,	PARC/NARC	ADB/WB, WFP, IFAD, ICARDA, FAO, UNDP
Strengthening of DOA with new/additional professional staff			5	10	15	DOA-AJK,P&DD, FD-AJK	P&DD,FD-AJK	ADB/WB, WFP, IFAD, ICARDA, FAO, UNDP
Training & Capacity building of research and extension staff			8	10	18	DOA-AJK	Training Inst. NARC	ADB/WB, WFP, IFAD, ICARDA, FAO, UNDP
Total 2.2			**25**	**50**	**75**			
2.3 Improvement of Support services								
Strengthen public-private partnership for service delivery			5	10	15	DOA-AJK, NGOs	NGOs, Private Sec.	ADB/ WFP, IFAD, FAO,
Creation of producers/traders associations			5	15	20	DOA-AJK, NGOs	NGOs, Private Sec.	ADB/ WFP, IFAD, FAO,
Facilitate private sector service delivery			5	15	20	DOA-AJK, NGOs	NGOs, Private Sec.	ADB/ WFP, IFAD, FAO,
Improve rural finance services			12	38	50	DOA-AJK, NGOs	NGOs, Private Sec.	ADB/ WFP, IFAD, FAO,
Total 2.3			**27**	**78**	**105**			
2.4 Re-establishment of land and property rights			20	60	80	DOA-AJK, Revenue, Deptt.	NGOs, CBOs	ADB/ WFP, IFAD, FAO, FAO, UNDP
Total 2.4			**20**	**60**	**80**			
Total Component 2			**407**	**659.624**	**1066.624**			

Component 3: Coordination and Monitoring & Evaluation

	Sub-component Main Activities/sub-activities	Unit Cost ("000")	Estimated Cost (million Rs.) Early Recovery 1-6 m	S-T Rehab. 6-18 m	M/L-T Reconstr. 18m-5Y		Proposed Implementation Agency	Critical Supproting Agencies/Partners	On-going/Planned Interventions Potential Funding Sources
	3.1 Development of Program planning and management mechanism		5	5	10	20	DOA-AJK, P&DD	P&DD-AJK	ADB/ WFP, IFAD, FAO, FAO, UNDP
	Total 3.1		5	5	10	20			
	3.2 Development of participatory M&E systems		5	10	17	32	DOA-AJK, P&DD	P&DD-AJK	ADB/ WFP, IFAD, FAO, FAO, UNDP
	Total 3.2		5	10	17	32			
	Total Component 3.		10	15	27	52			
	Grand Total Component 1-3.		187.725	2566.4	4332	7086.381			

Table 1b. Rehabilitation of the Livestock Sector in AJK

Short Term Recovery of Livestock Production System

Priority	Action	Total cost	Implementing agency	Supporting agency
1	Livestock shelter Establishment of temporary shelters with GI sheets 92,000HH	Rs.1380 million	MINFAL, Deptt. Of Animal Husbandry,AJK	ADB/FAO/USAID/JICA
2.1	Livestock feed/fodder and health coverage 500,000 buffalo and cattle including concentrates, UMB and wheat Bhoosa @ Rs. 75/animal for 90 days	3375 million	-do-	_do_
2.2	Vaccination and medication @Rs. 50 for Large ruminants and @ Rs. 10 /small animal	Rs. 30 million	-do	-do-
Medium and Long term				
1.	Departmental Infrastructure, Reconstruction of buildings etc,Planning and designing during medium term, 25% construction work during the medium term and 75% during long term@ cost per Sq.ft, earthquake proof structure@ rs 1500/sqft Laboratory/hatchery and hospital equipments	Rs.300 Million Rs. 100 million	Do	ADB/FAO/USAID/JICA
	Shelters/sheds in private sector Reconstruction of 92000 sheds in private sector as med. And long term measure@ Rs 45000 per shed	Rs. 4140 million	Do	Do

2.	Restocking Buffalo for 50000 HH at the rate of Rs. 50000/buffalo with an overall milk production of 10 litres	Rs. 2500 million	Do	Do
2.2	Small ruminants for 25000 HH, two sheep or goats at the rate of RS.3000 per animal	Rs. 75 million	Do	Do
2.3	Poultry Units for 150000 HH Five birds unit@ Rs. 500 per unit	Rs. 75 million	Do	Do
3.	Small scale intensive poultry units 200 farms of 500 birds each, day old chicks @ Rs. 25 per bird Building 155sqft @ Rs 350/sqft	Rs. 2.5 million Rs.105 million	Do	Do
4	Livestock Market It will be established in four districts HQ level Holding area, feeding area and other structures, Weigh bridge Ramp Capacity to hold 50-100 Large ruminants and 500 small ruminants	Rs. 10 million	-do-	-do-
	Grand Total	**Rs. 12.09 Billion**		

Table 2a. EARLY RECOVERY OF CROPS PRODUCTION AND IRRIGATION IN NWFP 1-6 MONTH

1.1 IMMEDIATE RECOVERY & IMPROVEMENT OF CROPS PRODUCTION SYSTEM	
Area in acres	Cost Rs. Million
Wheat cultivation on 29000	88.643
Fodder Cultivation 5000	15
Fruit-Orchards Rehabilitation 1000	10
Potato cultivation 5000	20
Peas cultivation 5000	5
Onion cultivation 500	1
Tomato cultivation 500	1
1.2 DEVELOPMENT & SUPPORT OF COMMUNITIES BASED ACTIVITIES	
Rehabilitation of 50 watercourses and 5 water storage tanks	20
Total for Immediate Recovery	170.643
2.1 SHORT TERM REHABILITATION OF AGRICULTURE PRODUCTION IN NWFP□ 6-18 MONTH	
Diffused fruit plantation 1 m plants	20
Inputs provision i.e. seed, fertilizer, pesticide for 4 seasons to 60% of 74000 hac @ Rs.7700 per ha	1367.52
Tillage operation for 60% of 74000 hac for 8 hours per season for 4 crops @ Rs.400 per hour	568.32
Capacity Building and promotion of new technologies	200
Improvement of support services	200
2.1 IMPROVEMENT OF SUPPORT SERVICES	
Rehabilitation of Agri; Research Infrastructure	100
Rehabilitation of Agri, Extension Infrastructure	200
Rehabilitation of Jaba Sheep farm Mansehra	50
1.2 DEVELOPMENT & SUPPORT OF COMMUNITIES BASED ACTIVITIES	
Rehabilitation of 50 watercourses and 5 water storage tanks	20
Total for Short term	2725.84
MEDIUM/LONG TERM REHABILITATION OF AGRICULTURE PRODUCTION IN NWFP (18 Months -5 Years)	
Establishment of fruit nursery farms 20 acres	60
Establishment of Seed farms 100 acre	160
Establishment of model fruit orchards 150 acres	10
Establishment of Germ Plasm Units 3 Nos.	30
Agro-forestry 10-m plants	30
Market infrastructure and MIS	500
1.4 LIVELIHOOD DIVERSIFICATION	
Promotion of off season vegetables 10000 acres	20
Olive top working 1m plants	20
Bee Keeping 100 units	2
Skills development of male and females in kitchen gardening, processing/preservation of fruits & vegetables, musl	20
1.2 DEVELOPMENT & SUPPORT OF COMMUNITIES BASED ACTIVITIES	
Rehabilitation of 220 watercourses and 35 water storage tanks	74.3
Establishment of Drip Irrigation System 100 Nos.	10
Subsidized Digging of Tube wells 30 Nos	9
Land Reclamation 20000 acres	36
2.3 IMPROVEMENT OF SUPPORT SERVICES	
Establishment of one soil and water testing lab.	20
Establishment of one pesticide residual testing lab as per SPS requirement.	100
Total for medium/long term	1121.3
SUMMARY OF TOTAL COST	
	Est. Cost (Rs. million)
Immediate Recovery Program	170.643
Short term rehabilitation program	2725.84
Medium/long term Rehabilitation Program	1121.3
Total	4017.783

Table 2b. Early Recovery of Livestock Production In NWFP (1-6 months)

1.1. Recovery & Improvement of Livestock Production System

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Provision of Animal Shelter	Rs.20,000 per HH	90000	1800
Provision of Feed for surviving animals	Rs.1800 per animal	500000	900
Tents for Storage of Feed	Rs.0.1m per Tent	260	26
Restocking of Dairy Animals	Rs.50000 per animal	60000	3000
Provision of Veterinary Cover	Rs.50m	Lump Sum	50

1.2 Development & Support of Communities Based Activities

Main Activity	Unit Cost mill rupees	Units	Est. Cost
Provision of Fodder Seed	Rs.2000 per acre	100	0.2

1.3 Targetted Support To Improve Livelihood Of Vulnerable Groups

Main Activity	Unit Cost million rupees	Units	Est. Cost
Plastic Sheets for protection of stored roughages	Rs.2000 per HH	30000	600
Provision of Chopping Machines	Rs.3000 per Machine	1600	4.8

2.1 Temporary Rehabilitation Of Public Services Facilities

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs. M
Establishment of Tented Vet; Extension Services (AI, CVH, CVD, CVC)	Rs.40000 per Unit	500	20
Rented Mobile Vet; Units	Rs.1m	10	10

2.3 Improvement Of Support Services

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Auxiliary Training to Livestock Farmers	Rs.25000 per training	400	10

(2) SHORT TERM REHABILITATION OF LIVESTOCK PRODUCTION IN NWFP (6-18 months)

1.1 Recovery & Improvement Of Livestock Production System

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Provision of Animal Shelter (Improved)	Rs.50000 per Unit	800	40

1.3 Targetted Support to Improve Livelihood Of Vulnerable Groups

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Distribution of Lactating Buffaloes/cows	50000	30000	1500
Distribution of Lactating Goats on 1st kid Return Basis	Rs.8000 per unit	70000	560
Distribution of Rural Poultry Units (4+1)	Rs.500 per unit	100000	50

1.4 Livelihood Diversification

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Private Public Partnership in Milk Processing	Rs.25m	Lump Sum	25

2.1 Rehabilitation Of Public Services Facilities

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Reconstruction of L&DD Building	Rs.800m	Lump Sum	800
Establishment of Mobile Vet; Units	Rs.3m per unit	10	30
Strengthening of CVDs, CVHs.	Rs.1m per unit	135	135

2.3 IMPROVEMENT OF SUPPORT SERVICES

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Farmers Training (male & females)	Rs.25000 per train	400	10

(3) MEDIUM/LONG TERM REHABILITATION OF LIVESTOCK PRODUCTION IN NWFP (2-5 years)

1.2 Development & Support Of Communities Based Activities

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Re-Seeding of Pasture / Grass Lands	Rs.1m per Dist	5	5

1.4 LIVELIHOOD DIVERSIFICATION

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Distribution of Elite Rams/Bucks	Rs.7000 per HH	500	3.5
Development of Location Specific Breeds	Rs.5m	Lump Sum	5
Development of Location Specific Feed	Rs. 2m	Lump Sum	2
Strengthening of Livestock Markets	Rs.100m	Lump Sum	100

2.3 IMPROVEMENT OF SUPPORT SERVICES

Main Activity	Unit Cost Million rupees	Units	Est. Cost Rs.M
Insurance Scheme for Dairy Animals	Rs.10m	Lump Sum	10
Grand Total			**9696.5**