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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 Jammu 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 trees, 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.

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PAKISTAN

POST-EARTHQUAKE

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

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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 km², 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 km² 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 life 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 alpine 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 ruminant 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 Fir, 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, 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	<ul style="list-style-type: none"> • Damage to standing crops. • Loss of food and input stocks. • Damage/loss of terraces and fields. • Damage to trees. 	<ul style="list-style-type: none"> • Inability to plant <i>rabi</i> crops.
Infrastructure	<ul style="list-style-type: none"> • Damage to irrigation facilities • Damage/loss of terraces and fields. 	<ul style="list-style-type: none"> • Reduced irrigation capacity for cropping. • Reduced land for crops.
Other Crop Related Damages	<ul style="list-style-type: none"> • Damage/collapse of agricultural extension and research buildings. • Loss of farm equipment and machinery. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Animal mortality. • Damage/collapse of animal sheds. • Loss of stocks of feed, fodder and inputs. • Livestock and dairy development buildings damages/losses. 	<ul style="list-style-type: none"> • 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 agro-climatic conditions which makes it 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 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 be 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	<ul style="list-style-type: none"> ○ Help rural communities to keep livestock alive and restart production. ○ Create partnerships between local Government and Communities. 	<ul style="list-style-type: none"> ○ Repair and restore assets. ○ Help communities return to farming. ○ Restart markets and trade. ○ Introduce targeted programmes for vulnerable groups. ○ Start programmes for livelihoods diversification. 	<ul style="list-style-type: none"> ○ Reconstruct an efficient agricultural and livestock system. ○ Promote suitable technologies, local value addition and new economic activities in rural areas. ○ Provide targeted help for vulnerable groups. ○ Promote new economic activities and local value addition.
Success Measure	<ul style="list-style-type: none"> ○ Number of farmers remaining on the land. ○ Reduced need for relief. 	<ul style="list-style-type: none"> ○ Restoration of production and incomes to pre-quake levels. ○ Reactivation of Community Organizations. 	<ul style="list-style-type: none"> ○ Resumption of rural growth. ○ Reduction in poverty ○ Increased market. activities and new trade patterns.
Major Risks	<ul style="list-style-type: none"> ○ Rural communities are weakened as farmers abandon land. ○ Farmers destroy assets such as livestock and trees for survival. 	<ul style="list-style-type: none"> ○ Unsustainable farming practices are introduced. ○ Poor and vulnerable not benefit from recovery and rehabilitation efforts. ○ Land disputes. 	<ul style="list-style-type: none"> ○ Inefficient or unsustainable farming is entrenched. ○ Rural communities are not strengthened. ○ 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.