Agriculture Policy

Khyber Pakhtunkhwa

A Ten Year Perspective

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(2015-2025)

Abbreviations

ADP	Annual Development Plan
AEZ	Agro-Ecological Zone
CDS	Comprehensive Development Strategy (2010-2015)
CSO	Civil Society Organization
DCO	District Coordination Officer
DDMA	District Disaster Management Authority
FAO	Food and Agriculture Organization of the United Nations
FSC	Farm Service Centre
FTS	Farmer Training Schools
GDP	Gross Domestic Product
IPM	Integrated Pest Management
NGO	Non-government Organization
NWFP	North West Frontier Province
PARC	Pakistan Agriculture Research Council
PDMA	Provincial Disaster Management Authority

Preface

The economy of Khyber Pakhtunkhwa is agrarian in nature where 80 percent of the total population is rural, with agriculture as their major source of livelihoods. Agriculture contributes 22 percent to the provincial GDP and provides employment to 44 percent of the labor force. However, 31 percent of the provincial population continues to be food insecure with high rate of malnourishment. Furthermore, the tight global food market, volatile food prices, high prices of agriculture inputs, energy crises, increased rate of population growth, gap between supply and demand, poor purchasing power of consumers, water scarcity and drought, unprecedented natural disasters and crises in Khyber Pakhtunkhwa has had serious impact on farmers despite provincial government efforts.

Cognizant of its increased responsibilities after 18th constitutional amendment, the provincial government and the Ministry of Agriculture, Livestock, and Cooperatives is focused on devising a meaningful policies and strategies aimed at promoting synergies and complementarities, based on a pluralistic approach for managing the natural resources base of the province to achieve economic growth. The growth in agriculture sector should also contribute to address the multiple economic challenges faced by the province by taking advantage of the unique and diverse agro-climatic conditions of the province which provides great potential for agriculture development. The agriculture policy aims at tapping these opportunities. There are more than twenty different fruits and vegetables grown in the province with enormous growth potential in the development of high value crops such as horticulture crops and floriculture, as well as the development of livestock sector that includes dairy products and meat.

In order to achieve the vision of food security, poverty reduction and economic growth, the agriculture policy is focused on increasing provincial government reliance on its own resources, improving the Government's capacity in terms of effectiveness and efficiency and future dialogues with donors, and multiplying efforts for resource mobilization with financing agencies. Further, it adopts a shift in approach from investing in infrastructure to socio-economic development of the province. To ensure proper implementation, the policy document elaborates on the roles and responsibilities of various stakeholders; focuses on institutional reforms and strengthening; enhancing department's capacity to respond to climate change and risk reduction; and actions to be taken in short terms to achieve quick and solid results. It also proposes a business Plans for value added agriculture and strengthen the capacity of the Department of Agriculture, Livestock and Cooperative. To ensure effective implementation of the policy, the Ministry will setup a governing body which should guide and monitor the implementation of the policy to achieve its short, medium and long term goals. The provincial government is committed to achieve economic growth in agriculture sector and reduce poverty levels of the province in general and of farmers in specific.

The Ministry of Agriculture, Livestock and Cooperatives appreciates the efforts of Food and Agriculture Organization of the United Nations and the Pakistan Agriculture Research Council in the formulation of the agriculture policy for Khyber Pakhtunkhwa, in close collaboration and consultation with the Department.

Minister for Agriculture, Livestock
and Cooperatives
Khyber Pakhtunkhwa

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Introduction

A.
The Need for a New Policy

The agriculture sector[1], including crops, livestock, on-farm water management and fisheries, in Khyber Pakhtunkhwa has not performed in line with its potential and there is an urgent need to accelerate growth of agriculture sector as a prerequisite for improving rural incomes and food security. During discussions between the Secretary Agriculture, Livestock and Cooperatives and FAO Representative in July 2012, it became clear that a new policy was needed in view of the many changes in the sector particularly the increased participation of the private sector and NGOs in agriculture, as well as the devolution of additional responsibilities for the agriculture sector under the 18th Constitutional Amendment. Khyber Pakhtunkhwa would also be the first province to prepare a new agriculture policy following devolution and the experience gained from this process would be useful for enhancing policy coordination at provincial level.

Initial meetings resulted in an agreement that the new agriculture policy and strategy would include a review of previous reports and policies; a vision, goal and longer term policy directions related to the public, private and NGO/CSO sectors, capacity development and use of land and water resources; a set of specific high priority actions for implementation in the short term; and business plans with well-defined implementation arrangements. The new policy would build on existing policy documents, particularly the "Agricultural Policy, NWFP 2005", the "Horticultural Policy, Khyber Pakhtunkhwa Province, 2009", Khyber Pakhtunkhwa Comprehensive Development Strategy 2010, and the ongoing preparatory work on a new policy for the livestock sector.

1 Throughout this report the term agriculture refers to crops, livestock, soil conservation, agriculture engineering, on farm water management and fisheries.

B. Approaches and Process Followed in Formulating the Policy

Work on preparation of the agriculture policy and strategy was initiated shortly after the request for assistance was made to the FAO by provincial Agriculture secretariat in 2012.The work was done in a highly participative manner. In the first phase departmental experts shared information on their mandate, funding, human resources and implementation status of projects and programs. Concurrently work was started on identification of high potential commodities and detailed plans for value chain development were initiated based on the information collected through questionnaires from concerned institutional/departmental heads of all districts. A planning and prioritization workshop was held in Peshawar on 28 July 2012 to draw together the outcome of district level priority setting process. The workshop, which included representatives from Agriculture and Livestock Departments from the provincial and districts levels, the Agriculture University Peshawar and the Chamber of Commerce, resulted in a strong consensus on the need to develop business plans on priority commodity areas with specific targets and strategies.

In late August 2012 consultations were also undertaken with senior officials of the Khyber Pakhtunkhwa Department of Agriculture[2], NGOs/CSOs and farmers. A preliminary draft of the policy was discussed with the Khyber Pakhtunkhwa Government at a meeting in Islamabad on 12th September and the overall policy and strategic directions were endorsed workshop with a wide group of stakeholders was held on October 3, 2012 to validate the draft policy circulated among the key stakeholders starting from Chief Secretary, departmental heads, civil society representatives, farmers along with international agencies representatives. The policy document was endorsed with a number of observations and suggestions that are further incorporated. Subsequently, working groups were set up to prepare detailed action plans and costs estimates for the activities set out in Chapter 5 of the policy.

2 The term Department of Agriculture refers to the Department of Agriculture, Livestock and Cooperatives.

Chapter 02

Background for the Strategy and Policy Formulation Process

A. The Current Policy Environment

The Main Policy Documents for Agriculture

The *"Agricultural Policy, former NWFP (now Khyber Pakhtunkhwa) 2005"* focused on the following five main areas: strengthening coordination and service delivery systems; creating an enabling environment for the private sector investment; introduction of participatory technologies; upgrading and strengthening existing legislation; tax relief in agriculture sector; and research and development. The *"Horticultural Policy, Khyber Pakhtunkhwa Province, 2009"* was developed under the leadership of the Agriculture Extension and Research sections of the Department of Agriculture and proposed actions related to reorientation of research and development; improving efficiency and profitability of horticulture; improved public/private sector partnerships; and market development. In February 2011, a "Think Tank on Agriculture Sector" was also established in the University of Agriculture, Peshawar and provided policy proposals on agriculture, water, and livestock.

The *"Comprehensive Development Strategy (CDS) (2010-2017)"* was developed by the Planning and Development Department with the objectives of poverty reduction and employment creation through the provision of the basic public goods; improving capacities, by ensuring modern regulation to promote competition; improve technical and vocational skills; and facilitating the private sector. With regard to agriculture the CDS proposed improved extension and research services; expanded availability of certified seed to the private seed companies; higher priority to providing foreign exchange for the import of fertilizer; reduction of distortions in distribution; improved efficiency of agricultural markets and maximized incentives for farmers with prioritized public private investment in market, processing and storage facilities; exemption from or reduction in taxes, including land tax, inheritance tax and Abiana; strengthened ability of government-financed procurement, storage and distribution, to provide timely purchase, and efficient and equitable distribution; increased farmer co-operation and participation in government services; facilitated private investment in livestock, fruit, water management and dairy; expanded agricultural credit, with the introduction of the passbook system in northern areas; diversification to higher value products, with investment in post-harvest handling, and diversification into non-farm employment in rural areas to facilitate consolidation of holdings greater attention to the efficiency of water use; recognized importance of forestry, wildlife and fisheries; emphasized on conservation, protection, development and management of fisheries resources; and the bringing of cultivable wasteland into farming, through provision of irrigation and land development with the help of bulldozers and tractors. The CDS proposed investment of about Rs.10-14 billion per year in the agriculture sector.

Finally, Khyber Pakhtunkhwa also developed an "Economic Growth Strategy" that focused on stimulating growth of high potential priority

sectors of the economy through enhanced public investments and complementary sectoral policies. Priority sectors included agriculture value addition and agro-processing industries, mining, oil & gas and hydro-power and tourism.

Assessment of Previous Policies and Lessons Learnt

The policies already in place have generally provided a clear assessment of natural resources and comparative advantage for agriculture in Khyber Pakhtunkhwa. They have also identified the subsectors and activities for which the Department of Agriculture considered there to be strong potential for expansion, along with key problems and bottlenecks that limit growth and development of these subsectors and activities. However, there was a feeling among stakeholders that the policy making process was not consultative enough and that the proposed actions were "wish lists" of the different sections of the Department of Agriculture rather than a coherent set of actions.

A review of actions undertaken under these policies suggests, at best, a mixed record of implementation success with most action items not implemented or only partially implemented. It also appears that implementation was more successful for activities that involved construction of facilities and purchase of equipment, rather than for those that involved more complex institutional change and coordination issues. Furthermore, there are no assessments or evaluations of whether the actions implemented resulted in the outcomes expected at the time the policies were formulated.

The mixed record partly reflects overall funding constraints, whereby allocations to agriculture are limited. It also reflects the present system of funds allocation where all development actions have to be prepared, submitted and approved in the form of projects (PC-1).This system is not only cumbersome and time consuming – senior staff in various departments spend large amounts of time preparing and following up on PC-1s - but also unpredictable with funding requirements not fully covered, or provided late with short deadlines for completing expenditures. In addition, there are a number of projects being implemented by the Department of Agriculture that have not been explicitly or implicitly covered by the policies in place. A clear lesson emerging from past experience is that the future policy has to go beyond simply identifying areas of potential and possible solutions and include:

- An estimate of funding required for various basic services and developmental initiatives with an indication of priority so that available funding is allocated to the most critical activities;

- An indication of whether full or partial funding should be from departmental core (ADP) resources or whether donor support is sought;

- Intermediate and final targets along with milestones, as well as monitoring and reporting system that will allow senior policy makers to keep informed of progress and problems; and

- An accountability system that defines who is responsible for what actions.

B.
Emerging Challenges

New emerging realities require the Government of Khyber Pakhtunkhwa, in particular the Department of Agriculture, to "think and act smarter", work more closely with internal and external partners and stakeholders, and take advantage of the new challenges and opportunities available.

The New Institutional Landscape

The institutional landscape in rural areas of Khyber Pakhtunkhwa has changed substantially in the last decade. The private sector is playing an increasingly dominant role as a supplier of inputs and services, a buyer of output and a link to both national and international markets. This has been a result of increasing commercialization, particularly in the horticultural sector, as well as in the livestock sector where flows of live animals and meat to and from other provinces and Afghanistan have increased. Another key factor has been the increasing monetization of rural areas due to remittances of workers in other provinces or outside the country. Over the last decade, and particularly after the 2005 earthquake, the number of NGOs/CSOs, and their penetration in rural areas has also increased rapidly- many NGOs/CSOs now have well trained and experienced staff with a good level of skills in providing technical agricultural services. The Department of Agriculture has started to adapt to these new realities and raise its level of interaction with the private sector, as well as the NGO/CSO sector. An important element in the change process is the creation of Farm Service Centers (FSCs) in all districts of Khyber Pakhtunkhwa. These FSCs, which are registered under the Co-operative Societies Act (1925), would facilitate access to markets, services, technology, and credit working in close collaboration with Governmental and non-Governmental organization.

Over the coming decade, growth of the private sector and increasing commercialization are likely to continue. The major challenge with regard to creating an appropriate institutional set up relate to:

- Regulating and guiding the private sector ensuring that they provide knowledge, services and market linkages but that best practices, such as truth in labeling in input supplies, are adhered to;
- Making use of the past work on NGOs/CSOs in building up a good network of community based delivery systems and a trained cadre of agriculture service providers; and
- Focusing public services on regulation, high level technical advice, basic service and overall policy making; facilitating collaboration between the private sector, NGO/CSOs and various; Government agencies at local (District) level; and promoting investments in poor and remote areas.

Devolution

Following the 18th Constitutional Amendment, in June 2011, several additional responsibilities related to agriculture were devolved to the provinces. The provinces were also made autonomous with regard to legislative, regulatory and policy making and could chose to either follow existing federal laws and regulations or promulgate new ones. Provinces have also been given authority to directly deal with donors and to borrow from international financing agencies such as the World Bank and the Asian Development Bank. A Council of Common Interests was also set up to allow the provinces to discuss, agree and coordinate various issues including adopting laws and regulation related to, for example, marketing and trade.

Under the 7th National Finance Commission Award, announced on 18th March 2010 and revised on 10th May 2010, the allocation of provinces in the total funding has been considerably increased from 49% to 56% during 2010-11 and 57.5% from 2011 -12 onwards. This has resulted in substantially increased provincial ADPs. In the case of Khyber Pakhtunkh-wa the total ADP allocation has increased by over 65% between 2008/9 and 2012/2014. Over the same period the amount allocated to agriculture has doubled but still accounts of only 2.4% of the ADP which is very small when compared to the share of agriculture in the economy (22% of GDP). There may be a case for further increases in the allocation to agriculture, provided the Department of Agriculture shows a capacity to plan and implement activities.

ADP Allocation for KHYBER PAKHTUNKHWA

(Rs billion)

Year	Total Allocation	Allocation for Agriculture	Percentage
2008-09	41.5	0.7	1.7 %
2009-10	51.1	0.796	1.6 %
2010-11	60.0	1.175	1.9%
2011-12	69.0	1.355	2.0%
2012-13	74.2	1.452	1.9%
2013-14	83	1.532	1.8%
2014-15	100	1.587	1.6%
2015-16	142	1.587	1.1%

Reduced Availability of Donor Funds

Following the earthquake in 2005, the law and order crisis in 2008/9 and the floods in 2010, large amounts of donor funding were provided to Khyber Pakhtunkhwa. In addition, substantial additional funds came in from migrant workers, and from private citizens either as direct donations or through national NGOs/CSOs. Much of this was short-term funding for relief operation which focused on immediate needs of earthquake, conflict or flood affected populations, including provision of seeds, tools and fertilizer to rebuild rural livelihoods. The large influx on funds was accompanied by a rapid growth in implementation capacity, mainly in the NGO/CSO sector. It nevertheless also placed a strong burden on provincial

institutions, including the Department of Agriculture which was called on to provide information and data to prepare plans and assessments; technical guidance to implementing NGOs/CSOs; and oversight and accountability, including addressing issues and answering of queries many of which related to the activities of NGOs/CSOs over whom the department had little direct control.

In the coming decade, Khyber Pakhtunkhwa is unlikely to receive similar amounts of emergency related, short term donor funding. This is partly the result of the global economic crisis, and partly the result of donor fatigue with funding for emergencies. It is likely that the external funding available will focus more on longer term development and be more demanding in terms of design quality, stakeholder ownership and sustainability. The Department of Agriculture will need to respond to this challenge by increasing reliance on its own resources, which are more than in the past but still limited. It will also need to improve its resource mobilization efforts with donors and financing agencies.

Chapter 03

A Vision and Guiding Principle

A. Natural Resources and Agricultural Performance

The Role of Agriculture

Agriculture accounts for about 22% of the provincial GDP, divided about equally between crops and livestock. Besides providing 44% employment to labor force, almost 80% of the population relies on agriculture for a significant part of their income. There are two distinct farming systems. In areas such as Swat and parts of Buner, there are extensive areas of flat valley bottom that have reasonable water supply from rain and snow, as well as surface and groundwater irrigation. In these areas about two thirds of crop land is under irrigation during Kharif (summer) season and half of crop land under irrigation during Rabi (winter) season. In other parts, particularly in much of Shangla and Dir, agro climatic conditions are harsher. Rainfall can be as low as 100 mm per year and most irrigation canals only provide water seasonally with groundwater playing an important role.

Wheat is the most important Rabi crop, while maize, rice, fruit, and tobacco are the main Kharif crops. Wheat straw, maize thinning and Stover are important by-products used for livestock. Vegetables are grown throughout the year and are an important source of both nutrition and income for household members. In Swat, the commercial production of fruits and vegetables has expanded rapidly over the last two decades and sales into urban centers of Peshawar, Islamabad/Rawalpindi and Lahore has become an important source of income. Livestock farming is a major source of food for the families providing milk as well as a form of saving what can be converted into cash at times of need. In the arid areas, livestock is more important for livelihoods than crops. In addition to the settled agricultural population, there is also a significant number of transhumants (Gujars). The Gujars specialize in the rearing of sheep and goats. The animals are grazed on the uncultivated areas and on crop stubble after the harvests in winter while in summers they stay at pastures for grazing. Their animals are mostly for sale to the large urban centers particularly during Eid times when it is traditional to sacrifice a sheep or goat. Fish are produced in the cold lakes and streams in the higher altitude areas as well as in ponds and water bodies in lower areas.

Past Growth Performance

The Planning Commission had estimated that in order to achieve the national economy growth targets of 7-8% per annum, agriculture would need to grow at 4%. Agriculture growth also needs to keep ahead of population growth by 1-2% to allow for increased consumption without increased reliance on imports. A number of steps have been taken to achieve these targets including liberalization of inputs markets .There is some evidence that the agriculture sector is capable of responding to the challenges ahead. However, in Khyber Pakhtunkhwa the agriculture sector has generally not

performed well over the recent past. Agriculture GDP growth has been slow (2.2%), has lagged behind other sectors in Khyber Pakhtunkhwa, and had failed to keep up with population increase and agriculture performance with rest of Pakistan. Livestock performance was particularly poor with growth of less than 2%. In contrast crops, particularly major crops did better while fisheries expanded relatively fast.

GDP growth Rates 1991/92 to 2004/05

	KP	Rest of Pakistan
Total GDP	4.4%	4.7%
Agriculture GDP	2.2%	3.0%
Crops	2.9%	3.0%
Livestock	1.9%	2.7%
Fisheries	3.5%	0.1%
Forestry	2.0%	15.3%

Source: NWFP economic report 2005

GDP at constant 1999/2000 factor cost

Areas of Potential

The low growth performance of agriculture underlines the fact that there are key constraints facing the sector, including poor use of available surface and groundwater, lack of good land management and a relatively shorter growing season. Raising agricultural growth to keep pace with population increase would require large investments in land and water development in the province. A first step in this direction is to focus on those underexploited potentials that can deliver the largest and fastest growth impacts, while reducing the inefficiencies and constraints that exist in the sector. In the crops sector the main underexploited potentials are in production of off-season horticulture crops, including seed crops under disease-free conditions; while in the livestock sector the greatest potential lies in the large rangelands where ruminants, particularly small ruminants and local cattle give good returns.

Water is a critical constraint in Khyber Pakhtunkhwa. Discussions with the concerned sections of the Department of Agriculture indicate that the greatest potential for increased irrigation[1] is from improved water management and conservation works such as small dams, water storage tanks, diversion structures, precision land leveling, installation of high efficiency irrigation system, and conveyance channels; improvements in the rodkohi system; and water conservation structures that increase soil moisture and recharge groundwater[2]. Similarly, there is good potential to improve water use efficiency particularly by adoption on better farm-level water management. Construction of mega projects such Gomal Zam Dam project and the planned Chashma Left Bank canal and other similar structures in other parts of the province will significantly improve irrigation facility.

1 The report does not consider the potential impact of large-scale irrigation works as these are outside the cover age of the provincial government.

2 Surface water flows in the province are also expected to increase in the future due to global warming.

The department of agriculture will also need to look into adopting alternative sources of energy such as solar energy for utilizing at the farm level to improve farmers' access to irrigation water. Certain areas in Khyber Pakhtunkhwa are water logged and saline and needs rehabilitation.

Potential for Increased Irrigation Water Supplies

Source	**Potential for Increase** *(million acre feet)*	**Comments**
Improved on-farm water management	9.5	[Best choice] Lining of water courses, construction of water storage tanks.
Reducing surface water run-off	5-6	Small dams, water harvesting, diversions from stream and rivers
Increasing groundwater pumping	0.4	[Least preferred] Increased supply from doubling the number of tube wells from 3,000 to 6,000 (assuming operational utilization of 25%)

B.
Guiding Principles for a New 10 Year Policy

Key factors that need to be kept in mind in formulating a new agricultural policy are set out below.

Building on Local Skills and Tradition

Farmers, traders and entrepreneurs in Khyber Pakhtunkhwa are highly skilled with a long tradition of successfully producing, marketing and processing commodities not only from the local production but also from neighboring regions. There are also strong networks of local practice and traditions that regulate how various actors in the rural areas work and interact with each other. These relate to almost all aspects of the rural economy ranging from implicit agreements between pastoralists and agriculturalists; various types of contracts, including for credit; and water sharing arrangements. Policies need to build on indigenous knowledge, technical and business skills by strengthening and empowering the various stakeholders.

Involving All Stakeholders to Serve the Farmer

There are large synergies to be gained through better coordination and integration. A recurring theme in all discussions about reduced impact of past intervention is due to poor coordination. Poor coordination exists within government services (for example electric tube wells installed in areas without reliable electricity and research and extension services working in different areas and not cooperating), as well as within the NGO/CSO sector there are no standardized operating procedures, protocols and nomenclature in use. It equally applies to coordination between sectors, for example, government sometimes working at cross purposes and in competition with private sector and NGOs/CSOs rather than complementing each other's work; and weak collaboration between the Department of Agriculture and Agriculture Universities. On the other hand there are a plethora of projects in Khyber Pakhtunkhwa, mainly donor funded, that have successful raised incomes through an integrated approach. Such successful examples of integrated and coordinated approaches need to be up scaled and mainstreamed.

Creating a *"Fit for Purpose"* Public Support System

The Department of Agriculture needs to increasingly support and regulate the work of the private sector and that of NGOs/CSOs, to align it with the provincial government priorities and increase its focus on very poor or remote areas where other stakeholders find it difficult to work.

The current staffing of the Department of Agriculture needs adjustment to its new role. It has a limited number of well qualified technical staff and is dominated by large numbers of support staff. In the field, staff lacks essential technical skills as well as facilities and budgets to work effectively. Furthermore, the Department of Agriculture mainly focuses on construction of facilities and buildings, and for provision of goods and services, often working independently of each other, with no accountability for results. Besides developing physical infrastructure, the future focus would be more on research and development activities in a program mode.

Staffing of the Agriculture Department

Department	Total Staff	Percentages Working As			
	Number	Managerial	Admin	Technical	Support
Agriculture Engineering	566	>1%	6%	2%	92%
Agriculture Extension	714	3%	11%	9%	77%
Agriculture Research	1,614	>1%	>1%	21%	79%
Crop Reporting services	392	7%	29%	13%	51%
Soil & Water Conservation	52	8%	2%	90%	--
On Farm Water Management	489	8%	1%	38%	43%
Livestock Research	536	>1%	--	20%	80%
Fisheries	485	2%	--	4%	93%
Total	**4,576**	**6%**	**10%**	**25%**	**74%**

Building Human Resources

The quality of staff working in agriculture needs to be improved and upgraded. This is the case for junior to mid level technical staff working in government, as well as a mid- to lower-level staff in private and NGO/CSO sectors. Particular efforts are needed to enhance the practical skills of the latter group and also provide a system of certification which would ensure a minimum level of competency. Khyber Pakhtunkhwa also needs to put in place an improved system for technology generation and adaption which better draws on the existing institutions in the province as well as on those in other provinces and at federal level. The University of Agriculture Peshawar can play a key role in this upgrading of human resources *(see box in annex 4)*.

Factoring in Climate Change and Disasters

Khyber Pakhtunkhwa has seen a number of major natural disasters over recent years and it is likely that the higher frequency of extreme weather events may continue in the future. In addition, temperatures are expected to rise in line with global trends. Studies for Pakistan suggest that rising temperatures are likely to result in melting of the glaciers in the western Karakorum and Himalayas which would increase river flows. In addition,

rainfall during the summer monsoon may increase by up to 20-30%, with much of the additional rainfall falling in high-intensity storm events[3]. In the case of Khyber Pakhtunkhwa, these trends pose challenges. Higher temperatures will require use of different crop varieties and livestock breeds, possibly from other parts of Pakistan, as well as improved on-farm water management practices to conserve soils and moisture. Similarly, enhanced surface water flows from rainfall and glacier melt will require flood control works as well as better preparedness and establishment of protocols and standard operating procedures in case of floods. However, these trends, particularly greater surface water flows, also create opportunities but will require significant investments in works for soil and water conservation such as for flood diversion and water harvesting and storage. Adaptation to the continued climatic changes in agriculture sector needs input support from agriculture research and The University of Agriculture Peshawar.

Chapter 04

The New Policy for Agriculture

The agriculture policy of Khyber Pakhtunkhwa will support and promote sustainable agriculture as an inclusive and dynamic source of economic growth and development; and a producer of food, incomes and employment. The specific goals and objectives of agricultural policy are to:

- Enhance sector productivity and competitiveness by activities such as improving the supply chain, technology dissemination and trade promotion;
- Address food security and incomes needs of the vulnerable sections of the population and targeted actions are needed to improve food security, reduce poverty and enhance the role of women; and
- Improve natural resource management, adaptation to climate change and disaster risk management.

A. Enhancing Sector Productivity and Competitiveness

Commodities and Commodity Chains

Agriculture has shown itself to be a strong source of growth and higher incomes in those parts of the province that have the land, water, climate, infrastructure and entrepreneurship to move into production of high value products. The focus on such products should continue and will include:

- large-scale, commercial production and processing of horticultural products particularly temperate fruit, such as peaches, plums, apricot, apples; off-season vegetables, such as tomatoes, potatoes, peas, cabbage and cauliflower; disease free planting material, particularly seed potatoes and saplings;

- specialty products, both fresh and processed, for niche markets such as tea, olive oil, strawberry, guava, high quality citrus, persimmon, walnut, durum wheat for the bread industry;

- maize, particularly hybrid maize, in both irrigated and barani areas, for the feed industry; tobacco for industry and sugarcane for sugar industry and Gurrmaking

- dairy along with meat and wool (sheep, goats), particularly from the extensive rangelands in the province; and

- fish from the colder streams and lakes in the higher valleys, as well as in small dams and lakes in the irrigated and rainfed areas.

Given the resource endowments, the province is likely to remain a relatively high-cost producer for number of other commodities such as wheat, fodder, cattle, dairy products and edible oil. For these items Khyber Pakhtunkhwa will continue to be dependent on other provinces or, as in the case of edible oil, on imports. In these commodities, the focus of policy would be to improve efficiency in existing production, processing, storage and marketing rather than in significantly expanding area and production. Nevertheless, an effort should be made to increase certified wheat seed from current 4-5% to 18-20% in the province.

There are well established value chains for commodities produced in the province for sale elsewhere (fruits, vegetables, small ruminants, etc.), as well as for commodities being brought into the province (wheat, rice, cattle, fertilizer, etc.). A review of these value chains indicates a high potential for improvement and to add value locally. This applies to outward value chains – for example, through better packing and handling of fruit and vegetable, production of jams, juices and other preserves from lower quality output, and local feed-lot fattening of ruminants before sale; as well inward value chains – for example by reducing the current practice of slaughtering productive animals, or transporting back to the Punjab, the cattle and buffaloes that have completed their lactation. The government has a critical role in improvement of value chains by supplying basic services related to improving the system, governing trade in commodities for example through better quality control, certification and branding as standardized production protocols and traceability; managing and improving the genetic makeup of crops and livestock in the province; and safeguarding natural resource and improving use of land and water for example through land use zoning and water management, development of high value fisheries including compatible high value exotic species (like sea bass, tilapia, pangasius, american channel cat fish) and local like trout through development of hatcheries, feed formulation and cold chain development and introduction of technologies such as integrated pest management (IPM) and organic agriculture.

Technology Generation and Dissemination

Generating, testing and disseminating new technologies for production, harvesting, packaging and processing are essential prerequisites for growth and one of the basic services on which the Department of Agriculture has to take the lead. The development of alternate energy sources, such as solar and wind power for production and processing would be an important area for research. However, a system to identify priorities need to be established. These should as far as possible be focused on the activities set out above where Khyber Pakhtunkhwa has potential for expansion and greater incomes, as well as on the possible impacts of global warming which may require changes in crops, livestock, soil and water management systems. A system to identify failed experiments also needs to be in place– for example the "top working" of olive trees carried out in the province is unlikely to result in a viable industry due to difficulties in harvesting and processing from the widely scattered plantations. Already integrated olive plantation/ processing projects are emerging. Similarly, tea plantation on arable lands has proved uneconomical for various reasons. With regard to technology dissemination, the focus has to be on farmer learning rather than on "telling" farmers what to do. Technical viability and economic feasibility of the new technologies works only if these are compatible with farmers'

resources and conditions. Good models, such as the Farmers' Field School with focus on system approach have been shown to be highly effective and efficient and intensive fish farming linked with cold chain and processing units. In addition, existing government training centers should be upgraded into vocational centers for developmental level courses to create a critical mass of certified service providers. Promotion of women inclusion, private industry linkages and academia involvement into Farms Service Centers (FSCs) activities will bring more acceptability and output of already established institution among masses.

Trade, Taxes and Pricing

The trade and marketing system needs to be as open as possible. The impediments that result in excessive margins and nontransparent practices need to be removed. Actions that can increase the bargaining power of farmers vis-a-vis traders and input suppliers have to be undertaken. A particular area where action is needed is to improve the system for livestock markets, including removal of price controls on milk and meat. New marketing avenues like Hut markets have to be explored for alternative options beside increasing bargaining power through promoting collective actions by strengthening farmers groups through FSCs.

Promoting Other Forms of Rural Income Generation

Rural areas in Khyber Pakhtunkhwa include some of the most spectacular scenery in Pakistan and tourism is a major source of income for hotel, restaurants and other service providers in the urban and rural centers. However, there are good examples from other countries where the inclusion of farming families in tourism has been enhanced. This has required government efforts to establish guidelines, standards, information exchanges and establishing linkages with tourist operators. Similarly, movements such as "Slow Food" have proven experience in promoting local foods, gastronomic tourism and food festivals which can bring in substantial income to farmers. Agro tourism is considered an innovative approach to increase incomes which also require integration with tourism department. Kaghan Valley and Naran are examples promoting fisheries and other local products, albeit in an unmanaged way.

Quality Control, Certification and Traceability

Farmers buying inputs such as fertilizers, chemicals and planting materials need to be assured that products are of good quality and labeled correctly. The Department of Agriculture needs to work with the private sector to establish mutually agreed systems for quality control, inspection, certification and, when necessary, sanctions. Similarly, quality control and certification for products, particularly for pesticide residue are essential. Many of the fruit and vegetables, as well as free-range livestock and cold water fish are produced with low or no chemical inputs and creating brands of "denominations of origin" would enable the charging of premium prices. Collaboration with laboratories at national level having capacity for hazard analysis and for maximum residual limits etc., needs to materialize to ensure

safe food supply to the consumers. Similarly certification for Halal meat would help to promote export. Improved slaughter houses, meat storage, packing and quick transportation will increase income for farmers within country provided sufficient government regulation and monitoring ensures quality food safety.

B.
Support Mechanisms for Sugarcane and Tobacco

Sugarcane and tobacco are important cash crops of the central plain regions of Khyber Pakhtunkhwa province with most of the production concentrated in the districts of Mardan, Swabi, Charsada, Buner, Nowshera and Mansehra areas. Almost 88,000 ha are planted to sugarcane with production of about 4 million tones, and 36,192 ha are planted to tobacco. Although the bulk of producers are big land holders who use modern farming techniques and machinery, there are also a number of small holders. Most of production is sold to the large processors in raw or, in the case of tobacco, in semi-processed form. However, substantial proportions of both cash crops are also processed on-farm and sold directly to consumers as well as tobacco companies. In fact the gurr from these areas is highly priced, being consumed in all parts of Pakistan as well as in the Middle East and Afghanistan. The tobacco, which is used in hukkas, commands premium prices. For cigarettes multinational and local tobacco cigarette private companies already set their quality and commerce wings in all tobacco growing area. Both sugarcane and tobacco are intensive users of key natural resources, particularly water and fuel wood, and there have been growing concerns whether these crops give the highest returns from these increasingly scarce resources. The social impacts of these crops, which rely heavily on migrant labour for certain steps in the value chain, are also of some concern.

The Pricing System

The pricing system for both crops is the outcome of discussions between well organized and informed stakeholders such as the Sugar Mills Association and the Pakistan Tobacco Board, and various producer and farmer associations. In the case of sugar, the minimum support price for sugarcane is announced every year for all provinces. In the case of tobacco the Pakistan Tobacco Board announces indicative prices for different grades. However the actual market prices fluctuates above and below these prices depending upon the supply and demand situation and the actions of the factory owners and large producers including on how long payments are paid in cash or are delayed. There have been attempts to build a more systematic system for the determination of prices for these and other crops but estimates, for example for costs of production, vary widely depending on whether it is done by farmers' groups or by industry.

Role of the Government

The provincial Government can play a role in the development of sugarcane and tobacco mainly through the actions below:

- Improved Evidence Base of Price Setting: The involvement of provincial

and Federal Government institutions, such as the Agriculture Policy Institute or the Agriculture Department, Khyber Pakhtunkhwa may help improve the evidence base for policy makers.

- Supply-side Actions: Improved varieties, better crop husbandry and better soil and water management could improve yields and the efficiency of resource use. Similarly, improved village-level processing – of sugarcane for gur and of tobacco curing – would reduce the negative environmental and social side effects, such as the large scale use of trees for fuel and the smoky and hazardous conditions in which some of the local processing of sugarcane and tobacco is done. Proposals for quality control and labeling of niche products, which could include gurr and tobacco for hukkas, is dealt elsewhere in this report.

- Firewood belts and plantations at village level can reduce high fuel wood pressure on the existing trees.

Transparency and Dispute Settlement

The commercial nature of the sugarcane and tobacco subsectors can lead to restrictive practices – such as refusal to buy the crop at the right time, bans on the movement of sugarcane or delayed payments; or disputes – such as over the sugar content of the cane or the quality of the tobacco. Government willingness, possibly through an arbitration mechanism, could be useful.

C.
Addressing Food Security and Needs of the Vulnerable Groups

Khyber Pakhtunkhwa faces an alarming situation with respect to food security and nutrition. Under nutrition is one of the main causes of death among infants and young children, and a very disturbing 48% of the child population of Khyber Pakhtunkhwa are stunted (shorter than expected for age group) with undernourishment impacting the development of their brains and affecting their productivity throughout the life[1]. In terms of livelihoods, the well-endowed areas are capable, after suitable development efforts, to provide a good standard of living and to meet the food needs of the population. However, there are other parts of Khyber Pakhtunkhwa where the land and water resources cannot meet the population's needs and out-migration, by at least a part of the population, is the only viable option. Given the social norms, such out-migration is mainly by the young males, and usually women, children and old people remain on the farm. While a number of essential food and non-food commodities can be purchased with cash remittances, many perishable but nutritionally critical food items, particularly meat, milk, vegetable and fruits, cannot easily be transported to these areas and need to be produced on-farm. Government policy needs to give particular attention to these areas as their poor resource base and remoteness make it unlikely that the private sector or NGOs/CSOs will operate there. The transhumant population is another group that has to receive much more attention than they have done so in the past.

Gender Mainstreaming

Traditionally all family members are engaged in on-farm work related to management of agriculture and livestock, but men tend to play the major role in marketing for both inputs purchase and sale of products. Due to migration of young men in many areas[2], the role of women, the elderly and young children has increased and they now run almost all aspects of small family farms. However, support services are still geared towards reaching male farmers. This needs to change and women, elderly and youth should be taken as the main targets for transferring new and appropriate technologies. There are known and proven techniques to do this such as Women Open Schools, Junior Open Schools, and integration of women into farmers' organizations by adopting appropriate cultural approaches. The aim is not to increase their work load but to make their current contribution more efficient and productive. The type of technologies also need to be targeted to their needs and cover topics such as backyard poultry raising, kitchen gardening and management of domestic livestock, as well as

1 Pakistan's National Nutrition Survey, Planning Commission, 2011

2 Some 1 million people from Khyber Pakhtunkhwa are working overseas - 25% of the total number of Pakistani migrants. In addition substantial numbers work in other provinces.

nutritional topics such as aspects food preparation, storage and consumption. Keeping in view the local culture of the province, the department will have to substantially enhance its female technical force to reach to women and young farmers in a more effective manner and include them in the district level farmers group to ensure their voice and role in the farming systems. Inclusion of gender marker integration in planning stages will also contribute gender mainstreaming programs and projects implementation.

The department of agriculture and livestock has a quota of 10% for targeted recruitment of women. Despite this quota, and the high proportion of women graduating from the Agriculture University, the number of female staff in the Department of Agriculture remains very limited and highlights the need that more efforts to encourage women to come forward. In this regard certain flexibilities in working condition may be considered such as flexible working hours, separate work places and transport facilities.

D.
Natural Resources Management, Climate Change and Disaster Risk Reduction

Land Zoning

Khyber Pakhtunkhwa has limited areas of land with good soils; water and transport links needed for the production of high value crops. These areas need to be carefully managed and effective land use zoning is an essential part of this. The current agro ecological zones are too broad and could not be adequately used for identifying and allocating areas specific certain high value crop or livestock products. An effort is required for scientifically dividing agriculture into zones and sub-zones by involving all related stake-holders including research, extension, industry and development partners. Good zoning is also needed to conserve agricultural land from diversion into other uses – particularly for housing. Zoning is further needed to reduce encroachment for residential and commercial building purposes next to streams and river, and on natural drainage lines. Revised zoning are also necessary to regulate intensive crop and livestock in urban and peri-urban areas to avoid pollution and contamination of groundwater. The policy on land zoning should be backed by the land use regulations banning productive agricultural lands for developing housing societies. There should be legal obligations on the housing societies and land mafias to put land allocated for housing in agricultural use unless there is construction up to certain proportion.

Soil and Water Conservation and On Farm Water Management

In areas where surface water flows might increase due to global warming as well as in the more agro-climatically fragile areas - arid and high elevations lands -there is a need to use this water efficiently through better soil and water conservation methods, as well as water harvesting techniques and small irrigation schemes can increase yields of both crops and livestock. Similarly, improved on-farm water management can yield good results but needs to move beyond watercourse lining to all aspects of water use below the farm outlet. Available bioremediation techniques could also be used treating and reusing waste water, particularly at household level. Improved land management techniques are also needed to ensure that cultivation on sloping lands which do not lead to rapid soil erosion.

Bio-safety and Bio-diversity

In the case of areas under intensive horticulture, there is a need to progressively move to an input regime that is based on a lower use of chemical fertilizers and pesticides as well as integrated pest management. This would not only conserve biodiversity but also reduce costs and ensure that soil and water resources are not damaged through pollution. It would also help farmers become aware of the fact that consumers everywhere are increasingly health conscience and products that can be certified as using low levels of chemical or are "organic" can fetch better prices. Conservation and propagation of precious medicinal plants should be targeted for promoting herbal medicine value chain. This would require more focus towards integrated crop management with managing crop-livestock interaction at farm level for increasing sustainable system productivity. The environmental changes and environmental safety aspects also needs to be looked for their impact on fisheries, forestry and wildlife of the province.

Disaster Risk Management

Khyber Pakhtunkhwa province has been facing number of manmade and natural disasters over the years. The occurrence of these disasters has increased in recent past leaving long lasting impact on the local population. The potential hazards of the province mainly include floods, climate change, conflicts, earthquakes, and pest/disease attacks. Therefore, the department will need to focus on enhancing its capacity in disaster preparedness, mitigation and response by adopting appropriate strategies and tools. The disaster preparedness and mitigation measure will be considered as integral part of department's normative activities and plans.

Given the increased variability in extreme weather conditions such as floods and droughts, the department, in consultation with other stakeholders such as the Provincial Disaster Management Authority (PDMA), District Disaster Management Authorities (DDMA's) and NGOs/CSOs will need to develop appropriate strategies and standard operating procedures for weather related food crises by linking weather patterns, agriculture productivity, and household food security according to situation in respective district.

E. Focusing on Implementation

A major focus of the new policy needs to be on implementation, particularly with regard to defining roles and responsibilities, allocating funds and assigning accountability.

Roles and Responsibilities of Major Actors

The key players responsible for implementation of the new policy are the government, farmers, private sector and NGOs/CSOs. This multi-stakeholder approach, with clear roles and responsibilities, is expected to substantially increase implementation rate of specific action items in the policy.
The specific roles of the three principal actors are outlined below:

- **The Government** will have lead responsibility for creating and enforcing a legislative and regulatory framework, setting up the partnerships to generate and disseminate new technologies, undertake activities that are focused on providing targeted support to poor and vulnerable groups, and managing and guiding use of natural resources including the use of pesticides and other chemicals. Investment in developing farm mechanization and modification of imported farm machinery to make them workable with local conditions and compatible with farmer resources and payment capacity would lay on the government line departments. The government would also support for "pump priming" by providing financial resources and technical backup for up scaling new technologies/processes, through filling critical gaps in output or input supply chains. In addition to its role, the government sector has to grow overtime based on increased technical strengths with more advisory and regulatory role, conducting demand driven basic research, developing capacities of the private sector service providers. This can be done through education extension, and trainings to promote technologies at initial level. Keeping in view the developmental aspects and providing a competitive environment for the commercial service providers to safeguard the interests of both consumers and producers (Formulation of projects and programmes to undertake technical and financial facilitation for community and other stakeholders will be main vehicle to do above mentioned tasks). In addition, the government has the responsibility to provide authentic and reliable data for effective planning and policy formulation. In this regard, the department will need to improve its capacities under the Crop Reporting Services in remote sensing and better reporting.

- **The private sector** will take the lead in generating the demand pull and access to markets that will drive production, storage and processing. It will also establish the supply channels for inputs, credit and farm machinery and equipment, as well as the services that are closely associated with the use of inputs – such as advice on fertilizer application protocols; use of veterinary drugs and medicines; and on use of packing materials. The private sector would also provide the investment that will drive change, bear the

associated risk and provide the necessary national/international market linkages. Overtime more expansion in the private sector as compared to government sector would ensure increase productivity, value addition, employment generation and sustainable solutions for developing commercial agriculture.

- **Civil society organizations**, particularly community based organizations will take the lead in provision of services that are not well covered by the private sector. This includes crop and livestock techniques that are not associated with inputs or markets – such as good agricultural practices for crop and animal husbandry. NGOs/CSOs would also provide interfacing between farmers, particularly small farmers, on the one hand and government and the private sector on the other hand. In particular they will facilitate and moderate, along with the government, the advice received from the private sector in areas such as the use of pesticides.

Creating an Enabling Environment for the Multi Stakeholder Approach

In order to effectively put in place the multi stakeholder approach to implementation, actions will be needed to establish an appropriate and enforceable legal and regulatory framework; strong coordination and integration mechanisms; and a focused human resources and capacity development programme.

- Clear specification of the regulatory framework under which NGOs/CSOs operate should be in place. In the case of NGOS/CSOs the key changes needed are an agreed set of protocols to work with – currently each NGO/CSO can use different approaches when working with farmers and communities which creates much confusion especially if an NGO/CSO working in an area is replaced by another; an agreed nomenclature and set of qualification for workers and service providers – for example it needs to be clear what a village veterinary worker can provide and what training and from whom he/she should receive this; and a set of criteria which would qualify them to work in rural areas providing services- for example a minimum number of technically qualified staff. NGOs/CSOs are themselves moving to improve self-regulation under the aegis of the National Humanitarian Network which will set standards including for public accountability and ensure transparency. CSOs in Khyber Pakhtunkhwa have also shown interest and willingness to continue to be involved in the community mobilization, community sensitization and community capacity building in various agriculture components; information dissemination on research findings, data collection for research and planning purposes and carrying out need assessment for the interventions; initiate social businesses in the partnership of government and other donors.

- In the case of the private sector, the major concerns relate to quality control of inputs supplied – for example there are well set out rules regarding standards and checks for drugs for human use while there are no corresponding rules for veterinary drugs; similarly, there are often concerns by farmers about the quality and composition of fertilizer, seeds and pesticides. In most cases existing legislation provides the necessary legal provision but need to be enforced.

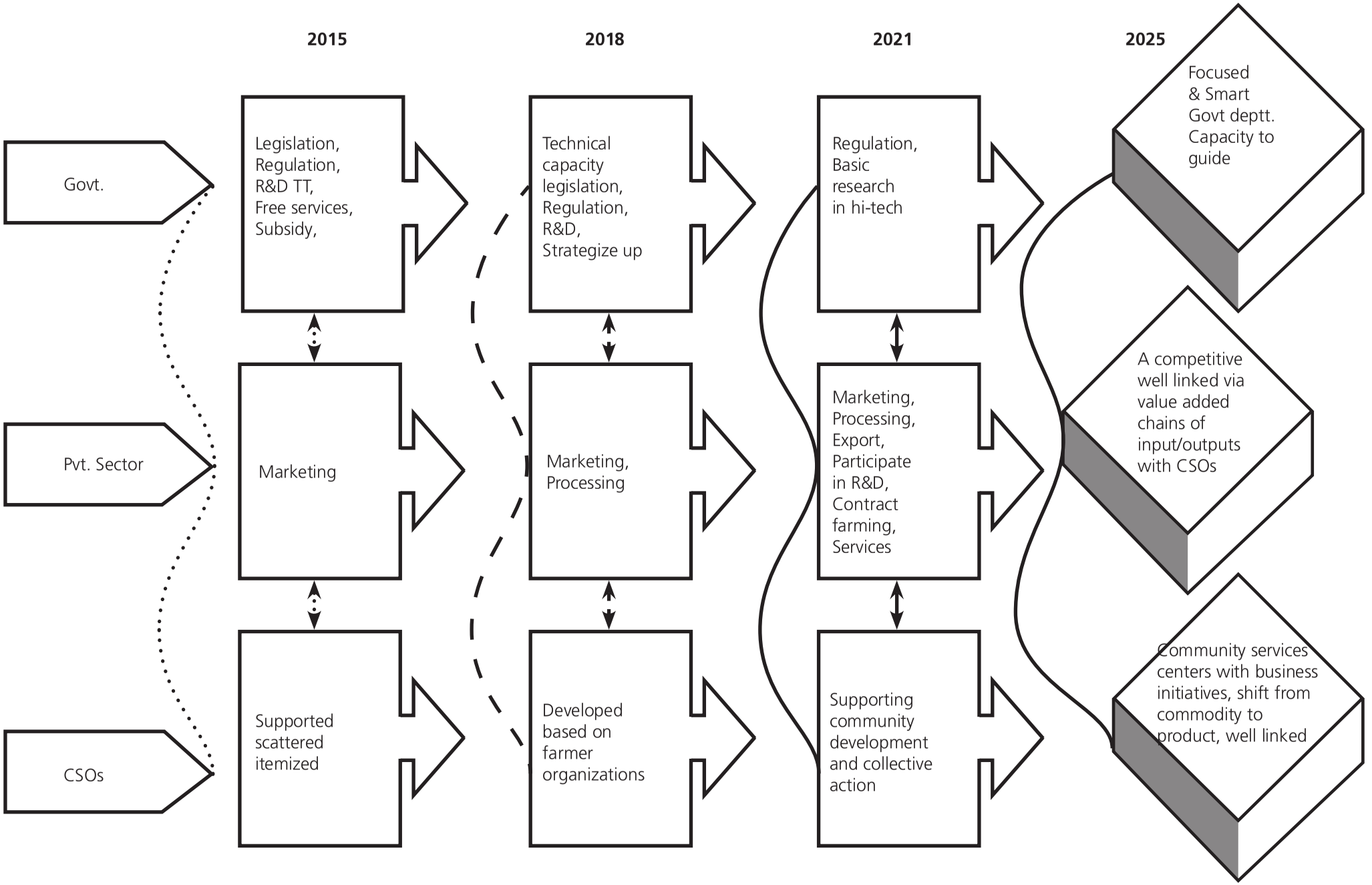
- Strong coordination and integration mechanisms are needed between the different Directorate Generals in the Department of Agriculture; with NGOs/CSOs and the private sector; with other departments, such as Forestry Department and the Food Department, whose mandates cover agricultural and rural issues; and with the Agriculture University. Such coordination could take place through a monthly forum chaired at Ministerial level. There is also a need to strengthen coordination and integration at local level where the bulk of the policies will be implemented. Building on the experience of emergency projects, the most suitable place for this to take place would be at district level where the Executive Development Officer (Agriculture), working with the District Coordination Officer, would review and approve the plans of various groups and organizations. The FSC provides a useful platform to undertake such local (district) level coordination but will require some training and strengthening.

- Human resources and capacity development programmes with a technical and vocational focus and also as a way to mainstream cross-cutting issues such as gender, environment, climate change adaptation, disaster risk reduction and impact of conflict. With 5 million farm families in Khyber Pakhtunkhwa, it is practically impossible for the existing provincial extension system to carter to the diversified, ever emerging capacity building requirements. Rapid scaling up of skill development with government extension through creation of Farmers Training Schools (FTS) in different agro-ecological zones will help to supplement the public sector efforts to educate the farmers and equip them with required skills to enhance productivity, reduce production costs, shift from commodities to products and to reduce income and food poverty. The FTS will also provide an opportunity for knowledge and skill upgrading of public sector extension agents and community activists.

Efficient Utilization of Public/Annual Development Programme (ADP) Budget

The ADP allocations remain the main instrument in the hands of the department to implement its policies. In order to make the best use of the enhanced allocations available after devolution, there is need for increased focus on integrated planning and programmatic approach to achieve results in an effective and efficient manner.

Figure 1. A Dynamic Diagrammatic Presentation of Roles and Responsibilities of Major Policy Actors



Chapter 05

Key Actions to be undertaken in the Short-Term

In order to launch the new policy a number of activities need to be implemented over the next five years. These were endorsed during the stakeholder's workshop in August 2012.

A. Actions to Enhance Production, Processing and Marketing

Critical actions that would set the agriculture sector in Khyber Pakhtunkhwa into a new growth path as suggested by proposed policy include nine high priority activities briefly described in the sections below along with costs over a five year period (2015-2019).

Enhancing and Strengthening the Commodity Chain for Key Commodities

A series of discussions and consultation with district and provincial experts has been used to prepare a list of suitable commodities for promotion in different districts. Further analysis of the supply chains of these commodities were conducted to identify the weak links and prepare proposals for intervention. These range from actions to improve supply of planting material to improved packing, storage and processing facilities. The issues of low productivity (high cost of production), low income due to low (no) value addition to excess supply (low prices to producers) and shortage (high prices for consumers) are expected to be addressed through implementing these interventions. These activities should be undertaken through farmers' organizations/private sector *(annex 3 for details)*.

Tentative Costs: The proposed interventions to strengthen value chains will imply expenditure on a range of improved facilities and services with the total costs to the government of Rs.7.0 billion.

Strengthening Systems for Technology Generation, Assessment and Dissemination

Technology generation in terms of inputs and farming practices, harvesting and post-harvesting systems, processing, and packaging and handling should be the major function of agricultural research in the province. Research needs to be done in collaboration with universities in Khyber Pakhtunkhwa and elsewhere, with research institutions at federal level and in other provinces, and with the Consultative Group for International Agricultural Research (CGIAR) system. Scientific staff in Khyber Pakhtunkhwa should also start engaging with the federal competitive grants system for cutting edge technologies. In view of the need for collaboration and the need to look across the supply chain, a strong multidisciplinary research planning and execution is needed. For this

purpose, a provincial system that reviews research proposals to ensure synergy, eliminate duplication and provide strategic focus, particularly on value chains with high potential, needs to be set up. This system should manage a competitive grant fund - the Punjab Agricultural Research Board provides some useful lessons on the best way forward.

Technologies developed have to be disseminated to the farmers and private sector. A Farmer Field School approach and participatory development would be suitable for the farmers while to the private sector other methods, such as technology fairs or open days, will have to be organized. Some success stories of commercialization of technologies and public private partnership could be learned from Pakistan Agricultural Research Council Agro-tech Company (private) –Limited (PATCO).The role of media wing of Agriculture Secretariat can be utilized and mainstreamed in achieving the objective.

Tentative Costs: Research, extension and training costs are estimated at Rs.3.0 billion including for collaborative research activities on strategic products in the value chain, a competitive grants system and technology dissemination activities mainly in poor and remote areas.

Creating Accredited Laboratory and Inspection System for Product Certification

Ensuring that the quality of inputs used and outputs consumed or marketed is of high quality is one of the most critical functions in the value chain. It is needed not only for developing sustainable export linkages but also to ensure that farmers have access to quality inputs, and that farmers and processors follow good practices in producing both food and non-food items. The International Standards Organization (ISO) benchmarks provide a good system for quality controls but so far in Pakistan there are only a few labs established for quality testing and diseases monitoring. Effective coordination and affiliation of department of agriculture with universities and the established labs which are underutilized could be streamlined to save the resources. For filling the gaps the Department of Agriculture should set up such labs in collaboration with the federal level research system or agricultural universities. The laboratory system will need to be completed by an inspection system that is empowered to do spot check and give fines or sequester contaminated products.

In addition to its role as a manager of the quality control system, the department also needs to take a proactive stance with regard to introduction of new systems (such as Integrated Pest and Nutrient Management), new products and protocols for improving product quality, and new genetic material in the form of planting and breeding material.

Tentative Costs: Establishment of two laboratories for crop and livestock, including running costs and an agricultural and livestock products quality testing service would require an investments of Rs.1.0 billion. Up gradation of the existing labs would be done through research projects from competitive grants.

Agriculture Zoning for Development

The identification and targeting of zones and sub-zones for specific products provides an opportunity for developing economies of scale in both input and output markets, as well as allowing government, NGOs/CSOs and other service providers to focus their activities. The creation of specialized product clusters have played a key role in many countries and offer large opportunities for generation of business, employment and investment to develop supply chains for certain products. The current agro ecological zone system is too broad to help in such planning. The Department of Agriculture would therefore lead an exercise, possibly with the federal and provincial institutions including the Agriculture University, that would identify specialized areas for production and processing, for each of the high value crop or livestock products. The zoning will take account of agro-climatic factors as well as the socio-cultural environment, labor availability and input/output market linkages. Declaration of one village one commodity in the short-term and one village one product in the long-run could provide a good target. There should be a policy shift from higher productivity to higher profitability through exploiting comparative advantages of these specialized zones. The commodity identification activity will need to be combined with the regulation of housing societies on agriculture lands. The increase in housing schemes has further reduced the already scarce agriculture lands and its productivity.

Tentative Cost: The cost of the surveys and assessments, and of a communications effort to inform stakeholders, including through Deputy Commissioner (DCG), would imply costs of Rs.0.2 billion.

Capacity Development and Registration of NGO/CSO Service Providers

The new policy proposes multi stakeholder approach with clear roles and responsibilities for various stakeholders. The government will play a key role in regulating the role of other stakeholders, which is in addition to their role. The CSOs would be supporting community development through collective action, getting technical backstopping from the public sector and developing linkages with the private sector for community business initiatives through Farms services centers. In order to strengthen their role, there is need to develop their capacity through training, internship and attachment programs by the line departments. NGO/CSO staff that has been provided training and internships should be certified by the department and authorized to carry out certain functions. There is also a need to review and evaluate their capacities through monitoring mechanism to orient their activities on scientific basis. Inclusiveness of the small farmers in the value chain has to be ensured through CSOs' service providers.

Tentative Costs: The estimated cost of evaluating and awarding certificates of trainings to NGOs/CSOs for its technical staff is estimated at Rs.0.2 billion.

Specific Actions for Promoting Private Sector Investment

The capacity to directly increase private investment does not lie with the government but market opportunities and profit levels. Government can,

however, help the private sector within Khyber Pakhtunkhwa to increase its awareness of opportunities in both national and international markets through study tours, participation in trade fairs and trail shipments. At the same time, potential investors need to be familiarized with conditions in Khyber Pakhtunkhwa by inviting them to visit progressive farms, collection points and processing units as well as organizing an annual agricultural fair. Government could also encourage the spread of small-scale private service providers in the agriculture sector by helping new graduates and youth to set up services companies related to animal health and reproduction, nurseries, pruning and pesticide application. Linking of new emerging market chains and supermarket stores with the farmers through FSC with social and legal coverage for investment for contract farming would help the small farm economy of Khyber Pakhtunkhwa.

A substantial volume of resources flows into Khyber Pakhtunkhwa from migrant workers. Most of this is invested in construction. However, promotional activities by the Department of Agriculture could help channel some of these funds into agricultural activities, including storage and processing units. The novel ideas of agro-tourism and social forestry were validated by the partners and to materialize these more integration with other non-agricultural departments like social welfare department, range and forestry would be needed.

Tentative Costs: Costs for promotional activities, training and other business support functions for promoting young people to start up their own businesses are estimated at Rs.1.0 billion.

Targeted Support to Selected Poor Areas

Various national surveys have confirmed the serious poverty and precarious food security conditions in various districts in Khyber Pakhtunkhwa. As land and water are the key constraints in these areas, Government support for activities such as for soil and water conservation works, community irrigation schemes, or on-farm water management is likely to give high returns in terms of human development. A community infrastructure development programme, targeted at the most poor and food insecure districts, would be undertaken on a matching grant basis with farmers.

Tentative Costs: Costs would mostly comprise matching grants for small scale infrastructure along with support for NGOs/CSOs to help poor communities organize themselves and prepare local development plans centered on the local infrastructure funded by the government. The allocation for this is estimated at Rs.8.0 billion.

Rangeland Development

Although rangelands are the responsibility of Department of Forestry, livelihoods of livestock farmers must be prioritized and supported with improved management of herds and rangelands. The large areas of rangeland in Khyber Pakhtunkhwa represent one of the most valuable resources of the province, providing high value livestock products, particularly sheep, goats and cattle. The regulation, development and proper usage of these areas is essential. Proper mapping, capacity assessment, good planning and monitoring are critical. However, in some places investments would be

needed in seeding with improved species and in water conservation and storage work, and for improving facilities for transhumant population and their animals. CSOs/NGOs have to be tailored to resolve social conflicts and developing ownership for common range lands. Work on regulations for protection of range land along with integration among the custodians and users for proper utilization of these resources is required. The pasture management of higher altitudes also needs to be studied and attention for protecting, conserving and promoting the livelihoods of the dependent pastoral communities. Some of these issues will be addressed by the Rangeland Policy to be implemented by the Forest Department.

Tentative Costs: Costs for planting material, capacity building and training are estimated at Rs.5.0 billion.

Disaster Risk Preparedness

A disaster risk preparedness programme will require an agriculture monitoring and preparedness system that would monitor rainfall and hydrological conditions in the major watersheds; strengthen local communication system for effective message delivery from provincial level to district and within district communication with local stakeholder and with farmers as most important stakeholders; promote community preparedness and awareness raising; and enhance the Department of Agriculture's capacity to undertake pre and post harvest assessment and prepare recovery plans. Beside disaster management the programs on insurance in agriculture sector need to be initiated for risk management and to attract private investment.

Tentative Costs: The cost under the disaster risk preparedness programme is estimated at Rs.0.5 billion and would cover hard ware systems such as setting up surveillance system at the provincial and linking it further with the districts, establishment of the local communication systems and use of local technologies, mobile phones, radio and TV channels; and software component including capacity building of the department staff and farmers in disaster preparedness and response approaches.

B.
Institutional Changes

Strengthening Farm Service Centers

The existing 25 Farm Services Centers, one in each district, have reached a level where these can act as focal points for collaboration between farmers, private sector and NGOs/CSOs. The Farm Services Center Act has been approved while rules are currently under review by the Law Department – will help to strengthen and clarify their role particularly with regard to improving the basic services and infrastructure at village level. In addition, the new act will allow FSC's to link with the private sector and play a role with regard to purchase of input supplies, marketing and credit. The FSC's will be challenged to take on these new functions, and a strong training and community mobilization effort will be needed. The recent investments in FSC's would provide the building blocks for enhancing services to the farmers. The credit institutions both from public and private sector need to be linked through FSC's until sufficient revolving funds are available with the FSC's to fund their activities at no loss no profit basis to minimize the cost and enhance profitability. Limitations in access to and availability of credit should not bottleneck the needed investments to cross the breakeven point.

Tentative Costs: The costs involved are estimated at Rs.0.3 billion and will be largely related to training of farmers' organization to play a greater role in the FSCs, as well as for seed capital to start various micro enterprises related to marketing, storage and processing.

Restructuring and Strengthening of the Departments of Agriculture and Livestock

The various activities set out above, if adopted, will require a Department of Agriculture substantially different from what exists at present. The department would have to be restructured both vertically – with staff resources being upgraded to take on technical as opposed to support and direct implementation responsibilities; as well as horizontally - with the structure changed to reflect the new suite of activities set out above. A new Department of Agriculture would help to create an enabling environment through pump-priming investments and focus direct assistance only to the poorest most food insecure pockets. Restructuring of the agricultural R&D departments as delineated above would need additional technically staff, on-job training programs from capacity development of existing staff in technical aspects along with participatory planning and action with community, supply of latest equipment and latest machinery, up gradation of laboratories with gradual decrease of support services of non-technical staff through their employment generation in private sectors and community service sector. Performance evaluation, based on results, as well as career structures has also to be transformed for technical staff overtime. In the short-term, promotion and service structure, linked with performance like number of varieties developed, yield improvement, technologies adopted etc, have to be revised and implemented while in the long run these had to be purely market based. Overtime the agricultural departments will grow more on technical aspects that would enable to provide the required

backup and solutions to the private sector under competitive market economy and a well aware & integrated farming community. The livestock department is formulating a separate policy on livestock which will further discuss and elaborated on these elements.

Tentative Costs: Costs of the restructuring of the departments are estimated at Rs.0.5 billion but would depend on the extent and speed with which changes need to be implemented.

C.
Review of Seed Act, Market Acts, Consumer Rights Act, Plant Breeder's Rights

The legal framework of agricultural produce marketing is governed by the Khyber Pakhtunkhwa Agricultural and Livestock Produce Markets Act, 2007. The Act allows Government prohibits the marketing of any agricultural or livestock produce except under a license granted under the Act. It also empowers the Provincial Government to create Notified Market Areas and establish and appoint the Market Committees; select the composition of the Committee; to empower them to levy and collect Market Fee on all transactions, inside or outside the Market. The Act reinforces, rather than diminishes, marketing power in the hands of Government and influential middle men. Under the 2007 Khyber Pakhtunkhwa law, the Provincial Government may arbitrarily declare any area as Notified Market Area.

There is a need to bring initiate reforms in the marketing operations and networks. Reforms are necessary to provide for dynamic, growth-oriented and efficient agriculture markets that incentivize growers and ensure a better deal for consumers. To achieve this, regulatory space needs to be created encouraging private investment, allowing for alternate trading platforms and niche markets to arise. Along with promoting competition with public sector markets, a reformed regulatory regime would cater for standardized market operations, reduce cost of doing business and ideally provide even-handed and efficient oversee arrangements through an independent marketing board comprised of representative stakeholders.

Seed act, plant breeders' rights act are still with the Cabinet Division for approval at federal level before devolution and have to be revisited under new provincial responsibilities and authorities. The consumer rights procedures are developed but not practically implemented in the country.

Tentative Costs: The cost of reviews and preparation of new laws and regulations is estimated to cost about Rs.0.3 billion.

D. Costs and Possible Funding Sources

Estimated Costs

Costs of the 12 activities listed above would require public sector investments of about Rs.27 billion over a five years period (2015-2019) – an average of over Rs.5.0 billion per year. This is much higher than the current allocation of Rs.1.5 billion under the current ADP but still equivalent to only 1.1% of the total ADP for Khyber Pakhtunkhwa– well below agriculture's share of the provincial economy (22%).

Estimated Costs

Policy Actions	**Description**	**Cost** *(Rs. billions)*
Enhancing and strengthening the commodity chain for key commodities	Actions to improve supply of planting material to improved packing, storage and processing facilities through matching grants at district level	7.0
Strengthening systems for technology generation, assessment and dissemination	Technology generation in terms of inputs and farming practices, harvesting and post-harvesting systems, processing, and packaging and handling in collaboration with universities in Khyber Pakhtunkhwa and elsewhere, with research institutions at federal level and in other provinces, and with the CGIAR system.	3.0
Creating accredited laboratory and inspection system for product certification	Laboratory system development to ensure that farmers have access to quality inputs and that consumers have safe and healthy foods.	1.0
Agriculture zoning for development	The current agro ecological zone system is too broad to help develop supply chains for certain high value crop or livestock products which need to be revisited for promoting the concepts of one village one commodity in the short-term and one village one product in the long-run with focus on increasing profitability rather than maximizing production	0.2
Capacity development and registration of NGO/CSO service providers	CSOs would be getting technical backstopping from the public sector and developing linkages with the private sector for community business initiatives through farm services centers while ensuring inclusiveness of the small farmers in the value chain	0.2
Specific actions for promoting private sector investment	Government can help private sector to increase its awareness of opportunities in both national and international markets through study tours, participation in trade fairs and trial shipments, annual agricultural fair, and also support new graduates and youth to set up services companies related to animal health and reproduction, nurseries, pruning and pesticide application	1.0
Targeted Support to Selected Poor Areas	A community infrastructure development programme, targeted at the five most food insecure locations, would be undertaken on a matching grant basis with farmers	8.0
Rangeland development	Rangeland carrying capacity enhancement, stocking facilities and services provisions, developing coordination among the stakeholders	5.0
Disaster Risk Preparedness	Institutional arrangements for developing seed and feed reserves, resistant plant material and early warning systems	0.5
Strengthening Farm Service Centers	FSCs to play a greater role supply or services as well as input supply, farm machinery, marketing and credit from formal institutions with increasing reliance on own savings/revolving funds.	0.3

Restructuring of the Departments of Agriculture and Livestock	Restructuring of the agricultural R&D departments would need additional technical staff, on-job training, supply of latest equipment, up gradation of laboratories with gradual decrease of support services of non-technical staff through their employment generation in private sectors and community service sector.	0.5
Review of Seed Act, Market Acts, Consumer Rights Act, Plant Breeder's Rights	Market act, Seed act, plant breeders' rights acts had to be revisited under new provincial responsibilities and authorities.	0.3
Total		**27.0**

In order to achieve a growth of between 3% and 4% in the sector, allowing it to keep ahead of population growth, investments from both public and private sources in the sector need to be running at about 20% of agricultural GDP[1] over the period 2015-19 – an estimated Rs.30 billion per year. Of this about Rs.5.0 billion would be from the public sector and the remaining Rs.25 billion from the private sector. This implies that each Rs.1 of public investment needs to leverage Rs.5 of private investment. The public investment programme proposed above aims to achieve this by being catalytic and paving the way for private investments, and promoting, rather than "crowding-out "the private sector.

Phasing, Prioritization and Financing

Although the programme as whole is expected to be implemented over five years, there are a number of activities which are essential to create a suitable enabling environment, and establish the knowledge and institutional basis for the overall policy and strategy. These activities comprise establishment of laboratories and an inspection system; agricultural development zoning; capacity building for NGOs/CSOs; disaster risk preparedness; strengthening of the FSCs; restructuring of the Department of Agriculture; and a review of laws and regulations. These activities need to be started on a priority basis with completion targeted over a three years period. In this short run period of three years the private sector under the prevailing law and order situation is expected to be less responsive hence initially more dependence would be on public funding.

Furthermore given the competing demands from other sectors, the ADP allocation for agriculture is projected to increase at about 15% per year and amount to about Rs.9.3 billion over a five year period. This leaves a substantial funding gap of about Rs.17.7 billion for which donor assistance, or funding from institutions such as the World Bank, the Asian Development Bank, IFAD or the Islamic Development Bank, should be sought. In the absence of full funding, priority should be given to the seven activities set out above. Expenditures on other items such as commodity chains; research; support to poor areas; and rangeland development should nevertheless continue to receive ADP allocations which would accelerate once the critical institutional and knowledge base have been established.

1 Estimated to average about Rs.150 billion over the period 2015-2019.

Costs, Resources Available and Funding Gap

	2015	2016	2017	2018	2019	Total
	Rs. Billion					
Estimated Costs	4.0	4.6	5.3	6.1	7.0	27.0
ADP allocation for Agriculture[2]	1.4	1.6	1.8	2.1	2.4	9.3
Funding Gap (Donor funding required)	2.6	3.0	3.5	4.0	4.6	17.7

2 Projections for the ADP for Agriculture are based on the allocation of Rs.2.4 billion in 2014, with a projected 15% annual increase from 2014 onwards.

Chapter 06

Business Plans for Value added Agriculture and Departmental Capacity Development

A. Background

The current agricultural policy and strategy of Khyber Pakhtunkwa has emphasized on improving sector productivity and competitiveness through development of value chains for priority commodities produced in the province. It is also highlighted that a high potential to add value in the commodities like fruits, vegetables and small ruminants existed in the provincial agriculture sector. As the agriculture of the province is mainly small farm oriented therefore policy document has particularly emphasized on the inclusiveness of small farmers in all the future value chain developmental activities. To address the major policy shift from higher productivity to higher profitability the investment proposals will be developed to provide solutions for both pre and post-harvest issues. The sustainability of the interventions will be judged on enhanced entrepreneurial skills and diversity of value added enterprises. Hence the policy document has underpinned strengthening system for technology generation in terms of inputs and farming practices, harvesting and post-harvesting systems, processing, and packaging and handling as a major function of agricultural research in the province. The earlier policy documents like "Comprehensive Development Strategy (2010-2015)" have also suggested investment in post-harvest handling along with diversification to high value products.

Beside rapid increase in population of Pakistan, the per capita consumption of fruits, vegetables, meat and other high value agricultural commodities has increased. In addition, the export of fruits and vegetables from Pakistan also increased considerably. The increased consumption and export for high value agricultural commodities particularly fruits and vegetables, has increased the demand for such commodities. The recent development in science and technology has to be integrated to intensifying the production and preservation of agricultural produce. In the face of burgeoning population and rising food demand the agriculture sector has to target high productivity through making adjustment to the climate change, land and water competition from non-agriculture sector and achieve competitiveness to make agriculture viable under free trade scenarios.

This policy shift would have profound effects on the nature of the agricultural supply chain, role of public policy and investment and would also be good for smallholders as the high-value and processed commodities augment income and generate additional employment opportunities in rural areas. In the past more emphasis was on increasing production through vertical and horizontal expansion of the agricultural commodities. However considerable food is wasted from the time crop is harvested till its consumption. The reported post-harvest losses are 28-42% worldwide, and 15-50% in less developed countries. The post-harvest losses for fruits and vegetables have been reported to the tune of 10-40% in Pakistan. Hence the current policy had focused on the integrated approach using three prong strategy; high productivity (reducing yield gaps), post-harvest management (reducing losses in the value chain) and developing departmental capacity to respond to the changing demands and institutional landscape with more focus on shifting service delivery and support system to community and private sector. The current policy is focused on developing commercial agriculture by ensuring increase productivity and value addition making line depart-

ments capable to respond to these challenges through providing sustainable solutions. This chapter, prepared by a team from the Pakistan Agriculture Research Council (PARC), working with FAO, contains preliminary proposals related to two components set out in the policy document related to Value Chain Development *(Section B)* and Strengthening of the Department of Agriculture, Livestock and Cooperatives *(Section C)*.

B. Value Chain Development

The current policy emphasizes shift from commodities to products through targeting productivity enhancement and post-harvest management to target sustainability through developing profitable and competitive agriculture. Along with the horticulture sector development, integrated crop management with managing crop-livestock interaction at farm level has to be achieved for increasing sustainable system productivity in the long run. The variety of diversified habitats is especially remarkable for fisheries development in KP and the major potential for increase in fish production lies in inland aquaculture. Therefore, two pronged initiatives are required to ensure food security and raise economic benefits through introducing intensive fish farming for increased productivity along with cold chain and improved processing facilities. Considerable waste occurs owing to the fact that small farmers lack resources and are unable to market their produce and implement suitable post-harvest handling practices. There is a need to undertake activities related to post-harvest processing, storage, grading, polishing, packing and other activities in addition to development of cool chain. A considerable share of vegetables/fruits is wasted due to negligence and lack of processing facilities, which could convert them into non-perishable form, permitting its transportation and storage without wastage. Value addition to agricultural commodities has assumed vital importance in the country due to diversity in socio-economic conditions, industrial growth, urbanization and globalization. There is a large potential for value added horticultural crops and products, which can bring many fold foreign exchange compared to what we are getting now. This can be achieved through good farm management, adopting good agricultural practices, promotion of products and byproduct industry through value addition, processing, improved picking, grading, modern packaging and marketing practices. The main focus of the proposal is to design appropriate interventions with investment plans to enhance productivity and reduce post-harvest losses to the minimum acceptable levels and increase returns to stakeholders involved in the value chain of high value agricultural commodities. Interventions will be introduced for increasing shelf life through improved skills and practices along with value addition and product diversification to decrease risk of market fluctuations, increasing income, employment and ensuring food security of the region. The current proposal is based on the estimation of losses of the priority commodities at the current production levels, prices and reported losses in the literature.

Estimation of Post-Harvest Losses for Developing Investment Plans

To justify the funding for value chain development plans and to evaluate the viability of investment, expected returns in terms of saving of post-harvest losses are estimated using current production levels, whole sale market prices and reported levels of losses for different commodities of interest for Khyber Pakhtunkhwa agricultural policy *(Annexure-1)*. It has not only provide logical basis for proposing viable investments plans to improve value

chains and reduce post-harvest losses but also helped to prioritize commodities based on the value of expected returns and extent of losses. The commodities are further grouped into soft fruits and vegetables, hard fruits, crops and meat (mutton).The expected returns from the savings are calculated at the possible reduced level of losses that will be achieved through the proposed value chain plans. The investment levels are determined based on the possible returns in terms of savings from reduction in post-harvest losses.

Issues and Constraints

There are many issues and constraints impeding the development of value chain of HVAP resulting in low productivity, high post-harvest losses, high price volatility and ultimately low profitability. The agriculture research and development system has not kept pace with the changing market scenarios and require developing capability and capacity for supporting producers in coping with the changing climate, poorly managed natural resources, water shortages, declining productivity, new market demands, rising food prices, and waning food security, not to mention natural disasters. The shrinking financial resources with poor integration of government agriculture system with private sector and civil society have widened the technology development and service delivery gap resulting in exploitation, high cost and quality issues etc. Beside service delivery and productivity issues, post-harvest management is still un-attended areas where lot of resources could be tapped that would also generate a demand pull synergy for improving farm level quality and adoption of best management practices that would lead to achieve productivity targets. Primary factors responsible for post-harvest losses are: poor pre-harvest measures, adoption of poor farming techniques (varieties with low shelf life, imbalance use of nutrients, insect pest and disease infestation and abiotic stresses), old harvesting procedures, non-utilization of pre-harvest recommended methods, harvesting at improper stage, careless harvest; post-harvest problems, non-removal of field heat, dumping produce, moisture condensation causing pathogen infestation, packaging in bulk without sorting and grading of produce, improper transportation and storage, distant and time consuming market distribution. These losses lead to lower net profit not only to the growers but also to other stakeholders in the value chain. For preparing investment plans major farm level issues and causes of low productivity and reasons of post-harvest losses along with possible areas of interventions are summarized in *Table 1* for fruits and vegetables and for livestock in *Table 2*.

Table 1. Issues and Areas of Interventions for Promotion of Value Added Agriculture in Khyber Pakhtunkhwa

A-Farm Level Issues	Areas of Interventions	Activities/ Approaches/ Mechanism	Institutional Arrangements	Training Needs, Skills & Capacity required
1. Lack of certified nursery plants of varying maturity level and lack of certified vegetable seed and local hybrids	Establishment of certified and clean nurseries with development of quality plants with varying maturity to manage market supply and reduce seasonal gluts and price risks, development of local hybrids and certified supply for vegetables	Establishment of clean nurseries onion each hub of fruit production area, research and development for local hybrids and certified seed production (community based) and supply mechanism for vegetables	Research (horticulture), Extension, Seed Certification, Community (FSCs/ CSOs)	Trained technical experts and technicians in clean nursery and hybrid seed production along with required technologies/labs
2. Limited trained manpower availability as service providers	Vocational and on-farm training of farm labor and service providers for skill development and promotion of BMP	Training of service providers (one in each FSCs) including field technicians in public and private sector as fruits and vegetable doctors through season long training programs at each hub of fruit & vegetable production areas	Research, Extension, Vocational Training Institutes and FSCs and private sector (input suppliers, manufacturers etc.)	Training in IPM, ICM, and multidisciplinary team development
3. Limited focus on skill development of farmers leading to adoption of traditional crop management	Shift from knowledge transfer to skill transfer through participatory on-farm training and demonstrations (like IPM approach) to farmers and farm labor	FFS approach based technical and business skill development along with collective action through FSCs	Extension-Research-(collaboration with federal and Punjab Agric.) FSCs/ CSOs	Master trainers from extension and research system and training modules development
4. None use of standardized production packages	Field demonstration for promoting standardized production packages	Demonstration of package of technologies through developing FFS in FCS	Research (horticulture), Extension, Community (FSCs/ CSOs, NGO'sand line departments	Development of area specific production packages (Soil and water testing with laboratory support)
5. Small landholdings– low financial capacity, Limited/inadequate credit and crop insurance facilities- resulting non-adoption of mechanized production practices and innovations	Strengthening FSCs (machinery/input pool, strengthening financial capacity through savings, developing entrepreneurial skills) and ensuring inclusiveness of small farmers in the Farmer Organizations, and introduction of weather/ water supply index based insurance schemes with promotion of innovations	Developing network of FSCs based farmer associations of small farmers and development of insurance schemes through community involvement	Extension-rural support programs-PPAF, Financial Bodies (banks) research and community	Livelihood based Social organization, training in weather indexing for insurance schemes
6. No or low farm level market coordination and pre-harvest contractor based marketing in fruits	Encouraging contractual (future markets) production and enhancing vertical coordination to increase producers' share in price spread along the supply chain	Vertical coordination through linking farmers associations at FSCs level with food chains/exporters	FSCs-Market Committee (local Govt)-Food industry-PHDEB	Collective and contractual marketing trainings
7. Increasing cost of inputs and quality concerns	Promotion of alternative nutrient option (biological control, bio-fertilizer etc.,), balance nutrient management (cropping pattern, time and method of application of inputs etc) and farm input market management	Up-scaling research outputs through commercial production of low cost input technologies and dissemination	Public Private Partnership and Business Companies in research organization	Biological products development and use
8. Declining water supply and land degradation (erosion, salinity etc)	Promoting efficiency in the use and distribution of water and integrated land and water-conservation approach with low cost indigenized technologies and packages	Participatory demonstration of indigenized HEIS technologies and soil and water conservation practices	OFWM-Soil &Water Conservation department-extension-private sector and FSCs	Developing a cadre of skilled service providers in HIES and conservation

B-Post Harvest Losses	Areas of Interventions	Activities/ Approaches/ Mechanism	Institutional Arrangements	Training Needs, Skills & Capacity required
1. Harvesting plan not integrated with maturity levels, shelf life, target market	Development and dissemination of maturity indices for each commodity/species/variety w.r.t. shelf life and market type	Dissemination of Commodity specific and user friendly maturity indices to farmers, service providers and market agents	Research (Post Harvest Section) - Extension-private sector (traders/exporters) and community	Technical know how imparting on maturity level and shelf life
2. Conventional Harvesting methods and tools	Standardized harvesting methods and use of proper harvesting tools/ clippers etc.	Training of labor and supply of harvesting tools	Research-Extension-Farm machinery Institute (pvt. Manufacturers)-Community	Farm machinery designing and adjustment to local condition (collaboration and training)
3. Un-skilled labor for harvest and post-harvest handling (quality unconscious behavior) and no focus on post-harvest management by actors in supply chains	Training and capacity building of service providers and chain stakeholders on post-harvest management	On job training of labor and awareness campaigns for post-harvest management and training of service providers and entrepreneurs across the value chain	Vocational Institute Agriculture University (business and post-harvest management programs)	Skill development modules and implementation
4. Poor grading and sorting	Awareness creation and establishment of pack houses for sorting and grading; development of standards packing material, capacity building	Promotion of size and quality based grading and sorting system at pack house level	Pvt. Sector (market agents), Community (FSCs)-Research and line departments	Design and development of packing material, standardize methods of packing and grading
5. Lack of postharvest treatment	Designing cleaning and washing equipment, popularizing post-harvest treatments	Identification and dissemination of post-harvest treatment methods and procedures	Research-Extension and Pvt Sector	Post-harvest management
6. Unscientific Packing procedures andimproper packing material	Standardizing packing procedures, awareness creation and production and promotion of cardboard cartons.	Packing & grading houses in production hubs, commercialization offsite specific technology	Research-Extension and Pvt Sector	Product specific packaging material designs
7. General transportation systems, same for all commodities, limited refrigerated transport facilities	Commodity specific transport through multipurpose containers with refrigerated facilities	Encourage private sector investment through policy support to improve transport system	Pvt. Sector	Transportation science
8. Improper handling at market and poor market infrastructure	Enhanced market facilities and improved market infrastructure	Investment of market fee and development of markets in private sector	Market committee and private sector	Product handling knowledge
9. Limited processing and value addition	Develop suitable technology, Awareness and training for stakeholders especially small processors and product development through primary processing	Promotion of primary processing and value addition with product diversification at household and small scale processing for fruits and vegetables	Community-Research-Extension and Pvt Sector	Processing and product development
10. Lack of proper storage infrastructure, poor knowledge of operation and management of storage facilities	Establishment of model cold storage and skill development for preparation and management of cold storages	Encourage private sector investment, training for storage operators	Govt-Private sector	Efficient storage facilities and product storage
11. Poor worker hygiene & poor market sanitation, and food safety issues and no traceability record	Implement GAP, GMP, HACCP schemes, establishment of appropriate food safety and quality Laboratories with trained scientists	Farm level implementation through joint projects with exporters and farmers' associations at FSCs level	Extension-Line departments-Private Sector and Community	Training of Experts

Table 2. Issues and Areas of Interventions for Promotion of Value Added Livestock in Khyber Pakhtunkhwa

Issues	Areas of Interventions	Activities/ Approaches/ Mechanism	Institutional Arrangements	Training Needs, Skills & Capacity required
1. Traditional management and breeding with limited veterinary cover and disease monitoring and control particularly for transhumant herds	Promotion of best management practices along with improved breeding, awareness of herd health management and supply of veterinary services along with disease monitoring and control in transhumant herds	Training of farmers in livestock management; private technicians; mobile health services and disease monitoring and control system for transhumant herds	Livestock research and extension, Herders	AI in small ruminants, disease surveillance, laboratory support
2. No range management, overgrazing and overtime decline of pasture led to poor and inadequate nutrition	Range land rehabilitation and pasture management strategies and awareness for low cost quality feed supplementation	Identification and preservation of potential germplasm, range land reseeding, pasture development, grazing schedules, dissemination feed formulation and preparation methods from local ingredients	Forest and Range departments, Soil Conservation, livestock extension, livestock research	Study tours for best practices in the region,
3. No basic facilities along the migratory routs and poor live animal market infrastructure (sheds, watering, feed, vaccination) and faulty price mechanism	Development of basic facilities along the migratory roots and live animal markets along with promotion of weight based price mechanism. Livestock research to work on the promotion of vaccines and de-wormers for the better health management of the livestock	Establishments of watering, sheds, feed facility/markets and health facilities along the routs and supply of weighing machines and establishment of market committees in live animal markets	Livestock Extension, livestock research, and market committees	Mapping of routes, best animal production and marketing practices
4. Underdeveloped meat and fish processing system with no mechanism for utilization of offal and byproducts and waste management	Establishment of model slaughter houses with offal and other byproducts management Development of models of inland fisheries intensive fish farming, cold chain and processing	Encouragement of private sector investment and export promotion (Halal meat, trout fish)	Livestock and fisheries Extension, Export promotion bureau, Private Sector (chain actors) and Community	Meat processing, enterprise development and SPS issues
5. Weak quality control and chilling/storage at wholesale or retail level	Anti and post mortem inspection services, awareness and development of storage and chilling facilities with improving quality standards in line with SPS and HACCAP	Quality control services through training of local veterinarians, Encouragement of private sector investment and vertical coordination with food chains and exporters	Livestock Extension, Export promotion bureau, Private Sector (chain Stakeholders) and Community	Training in Quality Standards, product handling and business skills
6. No meat grading cut based price system with low level of specialized skills for meat processing	Enhanced technical and entrepreneurial skills of the stakeholders involved in meat business to enhance grading and quality aspects	Promotional activities and linkages with the food chains and retail stores with capacity building of businessmen involved	Livestock Extension, Private Sector (chain Stakeholders) and Community	Skill development in quality meat production
7. Limited export promotion and low export as compared to the potential for halal meat	Export promotion to develop competitiveness and profitability of livestock farming Halal meat research facility should be developed for quality assurance at livestock and dairy development.	Establishment of small scale model slaughter hose and upgrade existing infrastructure of meat processing	Livestock Extension, Private Sector (chain Stakeholders)	Infrastructure and machinery along with skill development

Selection of Target Commodities

The commodities included in different value chain development schemes have been identified through a consultative process with all the stakeholders and collection of data through questionnaires from the concerned departmental/institutional heads of all districts and further debated in different consultative meetings during the policy formulation exercise. Existing level of losses along with the expected returns in terms of savings from reduction in losses through implementing proposed interventions is the second criteria for selection of the commodities. Keeping in view the level of market, processing industry and service sector development in the crops (maize, tobacco, sugarcane) there is little room for project based improvements except improvement in regulatory and support (research and extension) mechanism to safeguard the interest of the stakeholders. Hence for the present exercise only fruits vegetable and meat (sheep &goat) is targeted.

C.
Geographical Targeting

Production hubs of the selected commodities will be the starting point for conducting post-harvest management interventions. District and zone wise areas are prioritized based on the production levels of each commodity. Agro-Ecological Zone (AEZ) wise commodity concentration indicate that citrus is almost equally found in AEZ A, B and C; nearly three fourth of apple and peach is found in AEZ-A,90% Apricot and 85% plum in AEZ-A&C, 80% Guava in AEZ-C&D, nearly all of date in AEZ-D and walnut in AEZ-A, potato in AEZ-A&C while tomato in AEZ-A&D while sheep and goats are found throughout the province However certain market intervention along with packaging, cold storage, processing and value addition has to be developed at the places where their capacity is fully utilized. Such facilities had to be developed keeping in view the whole cropping pattern and seasonal production cycle of different commodities *(see Table 3)*.

D.
Financing Value Chain

Great potential from supply side with availability of sufficient and diversified resource base of the province, allows for intensive high value agriculture pulled by increasing demand from expanding domestic market and opportunities for exports. Promotion of value chain has become one of the priority development agenda and many development programs support value chain development. Although most of such programs deal with issue of finance yet the type and volume of finance ensured did not cover the needs of entire value chain. Furthermore the existing financial services are not tailored to the needs of the entire value chain and provide partial coverage of the entire production cycle (orchards and livestock) for small farmers and small scale agribusiness and primary processing. Hence a wide range of innovative products (insurance, leasing, investment loans etc.) combinations of financial service providers (banks, micro finance, community banks etc.) and other services including building vertical linkages in the financial services are required to achieve profitable and competitive value chain development. Therefore beside project base support, a pro-value chain development policy shift in the financial sector is required.

Table 3: Commodity Priority Matrix

Zones	Northern Dry Mountains (A E Z – A)	Eastern Wet Mountains (A E Z – B)	Central Valley Plains (A E Z – C)	Southern Piedmont Plains (A E Z – D)
Districts	Chitral, Upper Dir, Lower Dir, Swat, Buner, Shangla	Kohistan, Batagram, Mansehra, Abbotabad, Haripur	Mardan, Charsada, Peshawar, Nowshera, Swabi, Kohat, Hangu	Karak, Bannu, Lakki-marwat, D. I. Khan, Tank
Major Commodities	Maize, Apple, Apricot, Citrus, Plums, Walnut, Potato, Onion, tomato, Milk, Meat and wool, Cold water Aquaculture	Maize Apple, Potato Milk, Meat, wool, Warm water, aquaculture, coldwater aqua-culture (Please note that district Kohistan has very high poten-tial for meat, wool production)	Maize, Sugarcane, Tobac-co, Peaches, Apricot , Cit-rus, plums, Potato, Tomato, Milk, Meat, Poultry, Warm water Aquaculture, semi cold water Aquaculture	Rice, Dates, Guava, Ground nut, Turmeric (Potential only for district Bannu), Milk, Meat, Wool, Honey (Potential only for district Karak), Warm water Aquaculture
Selected/Com-mon Commod-ities	Dairy Meat Maize Horticulture (Fruits) -----	Dairy Meat Maize Horticulture (Vegetable) ------	Dairy Meat Maize Horticulture (Fruits) Warm Water Aquaculture	----- Meat ------ -------- Warm water Aquaculture
Special Commodities	Cold water fish (trout)	Cold water fish (trout)	Horticulture, olive	Hort. Date

E.
Interventions, Approaches, Institutional Arrangements and Costs

To enhance sector profitability promotion of high value agriculture and livestock is targeted and investment plan are focused on the reduction of losses along with value addition for achieving the objectives. To address the issues highlighted above possible interventions, approaches and institutional arrangements along with cost estimation is provided in *Table 4*.

Table 4. Interventions and Cost Estimation

Interventions	**Description of Approaches**	**Institutional Arrangements**	**Cost** *(Rs. Billion)*
Improved harvesting and post-harvest management skills and equipment	Training of labor and other service providers involved in harvesting and post-harvest management of fruits and vegetables for standardized harvesting methods and supply of proper harvesting tools/clippers etc.	FSC (Community)-Extension and line departments	2.0
Developing standards and knowledge dissemination on standard harvesting and post-harvest practices along with value addition	Development of harvesting indices, standardization of harvesting and post-harvest management practices, development of techniques (recipes)along with dissemination in user friendly methods	Research and Community	1.5
Development of private service providers and skilled labor	Training of private service providers like labor, machinery operators, mechanic, input suppliers etc., through vocational training programs for dissemination and adoption of best management practices	Research-Extension-line departments and Private Sector	1.0
On-farm value addition	Developing farmer organization through FSCs, Training of farmers (male and female) with supply of equipment for value addition and small scale processing (pickles, jams, tomato paste, drying etc) through development of clusters at the production hubs of each commodity.	Extension-community-Research and line departments	1.2
Community infrastructure	Development of sheds and model pack houses at FCSs level in the main production hubs of fruits and vegetables for reducing post-harvest losses through improved packing, processing and income diversification	community-Pvt Sector- and line departments and market intermediaries	1.5
Supply of Improved grading and packing material	Supply of improved packing material for transportation from farm to pack house to the community and sorting, grading equipment to the private sector along with training to the partners	community-Pvt Sector- and line departments and market intermediaries	0.8
Cold storage and refrigerated transport	Development of cold storage and chilling facilities along with promotion of refrigerated transport for distant markets through encouraging private sector (subsidy)	Private sector-Project support (subsidy)	2
Post-harvest treatment	Development and promotion of safe post-harvest treatment methods to increase shelf life, reduce losses through awareness campaigns and training	Community-Line departments –pvt sector	0.7
Health cover and disease monitoring for transhumant herders	Mobile health services along the migratory and grazing routs, disease surveillance and emergency control mechanism	Livestock department- livestock herders	0.8
Capacity building and skill development of livestock farmers and service providers	Vocational training for improved breeding, livestock management, treatment to farmers and technicians in private sector	Community-livestock department	0.5

Rangeland and pasture development	Rangeland reseeding, pasture preservation, grazing management/scheduling for carrying capacity enhancement, stocking facilities and services provisions, developing coordination among the stakeholders Research on fodder and forage species for development of range lands and production enhancement of livestock.	Community-forest and rangeland department, livestock research, agriculture research, transhumant herders	0.4
Herd management and feed development	Training on herd management, low cost feed formulation and development of community based feed production from local material. Supply of feed machines and training	Community-livestock department	0.3
Improving infrastructure for basic livestock facilities in the markets and migratory routs of transhumant herders	Development of watering, sheds, feed supply etc in the local livestock markets and along the migratory/grazing routs of the transhumant herders	Community and line departments and pvt-sector	0.5
Development of a model small scale slaughterhouse	A model slaughterhouse with processing facilities along with development of linkages with the food chains for promoting vertical coordination and strengthening export (slaughter house infrastructure machinery and cold storage etc.,)	Livestock department-community (FSC)-Pvt sector (food chains and exporters)	1.5
Total			**14.7**

F.
Departmental Capacity Development Plan

Current growth in agriculture sector is achieved through developing innovation by different agricultural departments. These department generate diverse technologies and services like improved plant and animal species, good agricultural practices, soil and water conservation methods, new machines and tools, low cost animal and crop inputs, crop reporting, effective crop-livestock extension approaches, services centers etc. Agricultural department has the requisite capacity to perform routine R&D functions. However, under changing national and international economic scenarios, agricultural departments have to adjust instantly to generate new stream of innovations and technologies. The World Bank agriculture report also highlights the need to adjust to the new ground realities where Pakistan is now no more a subsistence agricultural economy where agricultural sector of Pakistan is now in transitional phase and as a consequence market oriented value added commercial agriculture is continuously gaining importance. These facts highlight the importance of developing capacities of the agricultural departments to amicably respond and adjust to new market oriented agricultural sector development challenges and opportunities.

Capacity development of agricultural departmental will provide requisite impetus to rightly target commercially driven agriculture sector growth by involving all relevant value chain stakeholders. This would ensure finding science based solutions for the sustainable use of natural resources and generating innovations for promoting quality production of value added products. Skilled human resources, well equipped laboratories and appropriate financial resources would be critical in achieving requisite sectoral growth. The vibrant and fully operational departments would be able to effectively interact with all development partners including farmers, researchers, extension, policymakers, private-sector companies, entrepreneurs, nongovernmental agencies, and other intermediary organizations.

The capacity development of all the agricultural departments as well as refocusing coordination and integration with other stakeholders is an essential part of new policy focuses and action plans. More specifically, policy envisaged that the public sector departments would be enriched in their human capabilities and required technology to be responsive to make the private sector and CSOs flourish at much faster rate. The agriculture departments have to incorporate feedback from stakeholders, link communities effectively and more interactive implementations. Public sector will help to develop the private service system and most of current responsibilities will be shifted to private sector with overtime development in the value chain.

Departmental capacity development plans are prepared using value chain approach coupled with a system perspective and making agriculture sector research and development departments responsive to changing demand for technologies (research), extension and advisory services for the entire satisfaction of farming community and other stakeholders across value chain for major commodities. The other important policy focus is on increasing system profitability through cost effective technology development and improving flow of inputs and services to the end users. The departmental activities have to be converged on strengthening farming community through public sector support, improving their linkages with private sector, civil society and processing industry and market players using public-private-partnership approach (PPP) through ensuring appropriate incentives to the chain stakeholders by giving monitoring and regulatory role to the departments. Looking at the geo-political, social system, financial conditions and coordination and integration level among the policy focuses on capacity development rather than surgical improvements in the departments is proposed. Therefore the following departmental capacity development plans *(Table 5)* are prepared keeping in view the interventions, activities and approaches envisaged for commodity value chain development plans.

Systematic departmental capacity development will be achieved by investing in scientific manpower along with providing required scientific tools, equipment and laboratories. The array of support services is to be augmented by developing a cadre of youth as service providers in emerging high value production and value chain sectors. The current policy and business plans will provide a base for imploring funding from the international and national donors. Both the business plans for value chain and departmental capacity development are complementary to each other and have to be implemented simultaneously for achieving holistic agricultural development goals. The policy guidelines will be helpful in implementing R&D in program modes as against PC-1 based project modes. Annual development budgets and donor support would be used to effectively implement the policies, business plans and departmental capacity building.

Table 5. Departmental Capacity Development Plans

Departments	Additional Mandated Functions	Training Needs, Skills & Capacity required		Cost *(Rs. Billion)*
		HRD	Infrastructure	
1. Directorate of Agricultural Research	• Development of cost effective and quality production technologies to cater local consumption, industrial use and exports • Advance biotechnology and hybrid seed production • Modern pre & post post-harvest handling, packaging and processing technologies • Strengthen research linkages and coordination with national and international research and development partners	• Biotechnology, • Tissue culture • Bio-fertilizer and inputs (against diseases, pest etc) • Product development • On-farm participatory research and validation • Youth as skilled service providers	• Biotech and bio processing labs • Post-harvest labs, SPS & quarantine related certification/accreditation labs • Value added processing infrastructure • Vocational centers	**1.75**
2. Livestock and Dairy Development Department (Research)	• Animal biotechnology for effective disease control and high productivity for livestock and poultry • Development of best management practices for different livestock production systems • High value animal product development • Skill development in animal and poultry public and private service providers • Strengthen research linkages and coordination with national and international research and development partners	• Animal Biotechnology, • Disease surveillance • Low cost-high efficiency rations • Product development • Youth as skilled service providers	• Animal Biotech and disease surveillance labs • SPS & quarantine related certification labs • Value added processing infrastructure • Vocational centres	**1.25**
3. Fisheries Department	• Feed formulation and development of BMP for different cold and warm water fisheries • Improved re-production and seed production for diverse water bodies • Improved preservation, processing and product development	• Modern feed formulation and management practices • Fish reproduction • Cool chain, transportation and processing	• Fish nutrition lab and feed production units • Fish research and product development lab	**0.25**
4. Directorate of Agricultural Extension	• Institutionalization of learning by doing approaches (Skill development --FFS, ICMP, IPM etc.) • Strengthen feedback &linkages with research , education, CSOs, development agencies and private sector • Bridging gap in services for harvesting and post harvest management for field and horticultural crops • Strengthening and expansion of community service centers along with public and private service providers at grass root level • Enhance use of ICT in knowledge dissemination	• Certified cadre of master level facilitators • Value chain and post-harvest management • Use of Digital video and electric tools	• Up gradation of training centers • ICT center • Mobility/transport • Up gradation of field offices (Staff and infrastructure)	**1.75**
5. Livestock and Dairy Development Department (Extension Wing)	• Development and dissemination of different product based livestock production modules • Transfer of skills for product development and promote livestock and livestock product value chain development • Enhance use of ICT in knowledge dissemination	• Value added livestock • Use of Digital video and electric tools	• Up gradation of training centres • ICT center • Mobility/transport • Up gradation of field offices (Staff and infrastructure)	**0.90**

6. Directorate of On-Farm Water Management	• Popularizing use of alternate energy sources in HEIS by production systems • Promote sustainable aquifer/resource base water use • Development of irrigation systems/designs in consultation with relevant departments (crops, fruits, vegetables etc) • Promoting precision agriculture in collaboration with concerned public and private sector • Developing linkages and training of service providers in HEIS and precision agriculture	• Integrated planning and implementation (multidisciplinary) • System planning and technology design • Design and layout for HEIS by production system and soil type etc	• Improved equipment for soil and moisture evaluation • Other relevant equipment	**0.50**
7. Agricultural Engineering Department and Soil and Water Conservation	• Development and promotion of watershed based soil and water conservation practices • Documenting alternative uses of waste lands for targeting appropriate resource use maximization strategies • Indigenization and promotion of production system based low cost farm machinery & tools along with soil and water conservation technologies/practices (range land development, olive, forages and forest management etc)) • Strengthen linkages and coordination in planning and implementation with research , education, CSOs, development agencies and private sector	• Exposure and training in watershed management • Indigenizing modern practices with system management perspective • Design and development of farm machinery and tools	• Improved machinery and equipment • Institutional setup in relevant production systems • Farm machinery research and development institute	**1.50**
8. Directorate of Crop Reporting Service	• Integrated approach for reliable and accurate crop reporting data with federal and provincial concerned departments (SAPARCO, Bureau of statistics and other departments) • Identification of agro-ecological and crop system zones and sub-zones in collaboration with agricultural R&D departments • Analysis and reporting by zones	• GIS and net working • Information sharing, validation and synthesis • Data management and Statistical analysis	• GIS system • Computer lab and networking • Joint forums • Digitizing of data, Publication and sharing	**2.00**
9. Agric. Education Institutions (Agriculture, animal/veterinary, engineering etc)	• Inclusion of value chain and product development courses • Curriculum development and specialized courses for cutting edge technologies in coordination and consultation with line R&D departments (in-service training programs) • Academia and student exchange programs with R&D departments including extension services and field work • Collaborative project development in agriculture sector and sharing of lab facilities	• Faculty development in value chain and product development • Curriculum & field oriented Syllabus development • Outreach and On-farm research programs • Capacity building and in-service training for R&D departments	• Up-gradation of labs with focus on product development and certification • Joint forums and capacity development centers	**0.50**
Total				**10.4**

G.
Governing Board

The policies and business developed could only be implemented timely and effectively by forming a governing board. The Board will serve as an over-sight and evaluation body for monitoring the overall policy processes – this would include an operational board which would identify problems and propose solutions, a high level committee of "Wise Persons" who will periodically review progress and suggest new direction and revisions.

The board of governors will be comprised of:

i. President --- Provincial Agriculture Minister
ii. Chairman ---- Secretary Agriculture
iii. Members (20) --- (10)-Departmental Heads and (1) Vice Chancellor University of Agriculture Peshawar (2) Farmers selected from FSCs for two years (2) Private Sector Representative from agriculture agric. processing and exporters selected for two years (5) Eminent Scientists/agricultural Experts selected for two years

The Board will be set up by the Agriculture Ministry to provide many opportunities for input from concerned public sector research, development and education departments, community members, private sector and service providers. The board will give input and direction. The board will also set up sub-committees of experts with specific expertise to deal with specific areas and interventions launched for implementation of the policy directions and business plans. The board will help to reorient and direct the partners to take measures and develop project in line with policy directions while ensuring resource allocation to priority areas to achieve the growth targets. During each meeting the board will review the progress along with review of roles and responsibilities of the partners looking at changing demands and priorities and help to allocate available resource among the priority areas. The meetings of the Board shall be held at least twice a year and shall be presided over by the President or, in his absence, by a member nominated by him for the purpose.

Annex 1

Gross Value of Production, Value of Losses at Current Levels of Post-Harvest Losses and Net Possible Savings at future level of Losses

Commodities	**Gross Value of Production** *(Rs. Million)*	**Value of Post-Harvest Losses at current level** *(Rs. Million)*	**Net Possible Savings** *(Rs. Million)*
Soft Fruits & Vegetables (Peach, apricot, Guava, Plum. Tomato)	3583.98	974.95	525.58
Citrus and apple	3431.82	487.39	144.21
Dates and walnut	1654.57	384.57	204.47
Potato	1068.56	160.28	53.43
Crops (Maize, Tobacco, ◊ Sugarcane)	46822.19	5219.38	1115.50
Sheep and Goat (Mutton)	47197.71	4719.771	1415.9313
Overall	103758.81	11946.35	3459.12

Annex 2

Table 2.1 Showing Access to Food in KP Districts

Access to Food in KP districts 2009		
Rank	**District**	**Index**
1	*Upper dir*	*0.31*
2	*Chitral*	*0.37*
3	*Kohistan*	*0.38*
4	*Lakki marwat*	*0.47*
5	*Lower Dir*	*0.48*
6	*Malakand*	*0.51*
7	*D.I Khan*	*0.52*
8	*Charsada*	*0.55*
9	*Shangla*	*0.56*
10	*Buner*	*0.57*
11	*Karak*	*0.58*
12	*Tank*	*0.61*
13	*Swat*	*0.69*
14	*Swabi*	*0.73*
15	*Mardan*	*0.74*
16	*Kohat*	*0.77*
17	*Nowshera*	*0.80*
18	*Bannu*	*0.81*
19	*Hangu*	*0.83*
20	*Peshawar*	*0.84*
21	*Battagram*	*0.97*
22	*Mansehra*	*1.01*
23	*Haripur*	*1.02*
24	*Abbottabad*	*1.09*

Rank 1= Lowest

Table 2.2 Showing Monthly Income of House hold in KP districts

Monthly Income of house hold in KP districts 2009		
Rank	**District**	**Level**
1	*Shangla*	*< $ 1.00*
2	*Swabi*	*< $ 1.00*
3	*D.I Khan*	*< $ 1.25*
4	*Lakkimarwat*	*< $ 1.25*
5	*Tank*	*< $ 1.25*
6	*Battagram*	*< $ 1.25*
7	*Kohistan*	*< $ 1.25*
8	*Kohat*	*< $ 1.25*
9	*Malakand*	*< $ 1.25*
10	*Buner*	*< $ 1.25*
11	*Swat*	*< $ 1.25*
12	*Chitral*	*< $ 1.25*
13	*Karak*	*< $ 1.25*
14	*Charsada*	*< $ 1.25*
15	*Hangu*	*< $ 1.25*
16	*Lower Dir*	*< $ 1.25*
17	*Haripur*	*< $ 1.75*
18	*Upper dir*	*< $ 1.75*
19	*Bannu*	*< $ 1.75*
20	*Nowshera*	*< $ 1.75*
21	*Abbottabad*	*< $ 1.75*
22	*Mansehra*	*< $ 1.75*
23	*Peshawar*	*< $ 1.75*
24	*Mardan*	*< $ 1.75*

Rank 1= Lowest

Table 2.3 Showing Food Consumption in KP Districts

Food Absorption/Consumption in KP districts 2009		
Rank	**District**	**Index**
1	*kohistan*	*0.22*
2	*Upper dir*	*0.34*
3	*D.I Khan*	*0.39*
4	*Battagram*	*0.46*
5	*Shangla*	*0.46*
6	*Buner*	*0.53*
7	*Karak*	*0.55*
8	*Lakkimarwat*	*0.57*
9	*Mansehra*	*0.58*
10	*Lower Dir*	*0.59*
11	*Hangu*	*0.60*
12	*Tank*	*0.61*
13	*Swat*	*0.65*
14	*Malakand*	*0.65*
15	*Bannu*	*0.65*
16	*Swabi*	*0.66*
17	*Chitral*	*0.66*
18	*Mardan*	*0.69*
19	*Kohat*	*0.70*
20	*Charsada*	*0.71*
21	*Peshawar*	*0.75*
22	*Abbottabad*	*0.76*
23	*Haripur*	*0.77*
24	*Nowshera*	*0.77*

Table 2.4 Showing Percentage Food Insecure Population in KP Districts

Food insecure Population in KP districts 2009		
Rank	**District**	**% age of food insecure**
1	*Upper dir*	*75.6*
2	*kohistan*	*73.5*
3	*Lakkimarwat*	*66.3*
4	*Lower Dir*	*64.5*
5	*Karak*	*63.7*
6	*Malakand*	*61.0*
7	*Shangla*	*60.9*
8	*Chitral*	*60.7*
9	*Buner*	*60.6*
10	*Tank*	*60.0*
11	*D.I Khan*	*56.0*
12	*Charsada*	*54.7*
13	*Swat*	*54.2*
14	*Hangu*	*54.2*
15	*Swabi*	*53.0*
16	*Kohat*	*52.6*
17	*Bannu*	*52.1*
18	*Mardan*	*51.3*
19	*Battagram*	*50.4*
20	*Peshawar*	*49.3*
21	*Nowshera*	*47.5*
22	*Mansehra*	*46.7*
23	*Abbottabad*	*40.6*
24	*Haripur*	*40.2*

Annex 3

Planning Matrix for Priority Commodities

The table below elaborates on the potential commodities with guiding notes on value chains development. The table below present inputs of district level agriculture and livestock department staff gathered during a consultative session.

Commodity Group	Fruits
Constraints	1) Lack of Certified Nursery Plants of varying maturity periods
	2) Non use of standardized production packages
	3) Low level of market integration for supplying properly harvested, stored, packed and value added products
	4) Limited trained manpower availability as service providers across whole fruit value chain
Recommendation	1) Certified and clean nurseries establishment
	2) Field demonstration for promoting standardized production packages
	3) Linking all partners involved in production, harvesting, processing and marketing functions
	4) Training community based service providers for the whole value chain
Goals/objectives	1) To popularize best orchard management practices
	2) To introduce improved pre and post harvest technologies
	3) To develop well integrated value chain for efficient marketing
Objective wise Activity plan	1.1 Documentation of best practices (documentaries, media talks, exchange visits, print media)
	1.2 Establishment of demonstrations (identification of locations, management of Irrigation, nutrient, compost use, plant protection etc)
	1.3 Training of service providers (Trainees Selection, training need assessment, training duration, institutions, curriculum, ToRs and Follow up for quality assurance)
	2.1 Plant nutrient management specific to fruit storability and processing
	2.2 Training of pickers, use of proper picking tools, treatment of fresh fruit, storage, packaging, transportation
	3.1 Agreement between value chain partners (Production package, harvesting methods, handling, prices, etc)
	3.2 Involvement of different tears of service providers at different levels of value chain
	3.3 Bulking, grading, pricing and marketing arrangements for domestic and export markets
	3.4 identification of different product lines in consultation with value chain partners (farmers, market intermediaries, processors/exporters, R&D experts)
Approaches/Mechanisms	1.1 Experts consultations, review, case studies on most effect communication means for different practices
	1.2 participatory, clusters formation and FFS approach,
	1.3 Participatory selection of Service providers, establishments of community service centre
	2.1 Review of existing knowledge and experimentation (research)
	2.2 Market-based harvesting and handling plans
	3.1 Collective planning
	3.2 on-job or vocational centre based training
	3.3 Market analysis
	3.4 Consumer preferences based product development
Institutional arrangements	1.1 Extension-Progressive farmers-Research collaboration
	1.2 Extension-community-Research and line departments
	1.3 Community and partner institutes
	2.1 Research-extension
	2.2 Individual entrepreneurs, community cooperatives or industry/processors
	3.1 Network of value chain partners
	3.2 Community Service Centre
	3.3 Individual entrepreneurs, community cooperatives or industry/processors

Roles and responsibilities	1.1 Lead role Research, Partners Extension, Community
	1.2 Lead Role Extension Collaborators Line Departments
	1.3 Lead Role Extension Collaborators Line Departments
	2.1 Lead role Research, commodity programs
	2.2 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
	3.1 Agric. Secretariat involving line departments, CSOs, and Pvt. Sector
	3.2 CSOs with backup from line departments
	3.3 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
	3.4 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
	1.1 Lead role Research, Partners Extension, Community
	1.2 Lead Role Extension Collaborators Line Departments
	1.3 Lead Role Extension Collaborators Line Departments
	2.1 Lead role Research, commodity programs
	2.2 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
	3.1 Agric. Secretariat involving line departments, CSOs, and Pvt. Sector
	3.2 CSOs with backup from line departments
	3.3 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
	3.4 Pvt. Sector (food Chains) in collaboration with CSOs and line departments
# of locations	• Orchard system based selection of minimum one site in each district (13 locations in two zones)
	• 2 clusters per site (total 26 clusters)
# of demonstrations	• Four demonstrations per cluster (104)
	• 26 nurseries development (one in each cluster)
Partners/Recipients	Extension, research, community/farmers, NGOs, Rural Support Programmes, market players, processors, exporters, services providers, input suppliers,
Outputs	∞ Availability of quality plants from 26 nurseries
	∞ Adoption of GAP
	∞ Productivity enhancement
	∞ Reduction of losses
Outcomes	‡ Increased profitability
	‡ Ensured supply of quality inputs/cadre of services providers
	‡ Employment generation
	‡ Increased income and economic growth
Indicators of success	• Establishment of 26 nurseries with a capacity of 100000 plants per year
	• Farmers exposures to production packages 100 per year at each demonstration site (10400 Farmers per year)
	• Trained farmers through FFS (One FFS at each demonstration sites training 30 farmers each year
	• Establishment of Industry (13 units one in each district of two zones)
	• Trained service providers (10 at each demonstration sites Total 260 per year)
	• Establishment of community service centre one in each clusters (total 26)
Timeframe	3 years
Assumption	• Identification of leadership roles
	• Additional resources availability from donors and government
	• Industry and partners commitments
	• Continuity of services providers
	• Representative sites
	• Involvement of decision makers at service centers

Planning Matrix for Priority Commodities

Commodity Group	Meat
Constraints	1. Week indigenous and exotic breeding system for high meat production and aquaculture
	2. Incompatible feeding regimes and limited development in fish feed industry
	3. Deficient animal health, breeding and other management services
	4. High market exploitations/imperfections/poor infrastructure
	5. Inappropriate slaughtering and retailing services
	6. Limited cold chain infrastructure and processing
	7. Conventional price regulatory system
	8. Poor quality control and regulatory systems
	9. limited extension services for specialized meat production and inland fisheries
	10. Increasing strain on aquatic resources due to water pollution
Recommendation	1. Identification, multiplication, conservation, replacement of low yielding animals with high producing animals and modern hatcheries
	2. Planned cross breeding of local high meat yielding animals with exotic breeds
	3. Improved fodder/forage production, preservation and supplementation
	4. Development of cadre of health, breeding and other improved animal management services
	5. Alternate more efficient marketing channels development
	6. Modern slaughtering and processing infrastructure for export promotion and niche market development for high value fish (trout etc)
	7. Improved price regulatory system
	8. New quality control regulatory system
	9. Provision of advisory services and technical knowhow for post-harvest and processing of meat and fish
	10. Restocking of untapped water reservoirs to their full potential along with conservation of water bodies
Goals/objectives	1. To popularize best meat breeds of indigenous and exotic origin
	2. To improve feeding, health and other services for quality meat and fish production
	3. To develop well integrated value chains for efficient marketing and processing of livestock and fish meat
Objective wise Activity plan	1.1 identification of high meat producing indigenous meat breeds through using animal bio-technology
	1.2 Breed improvement program with both indigenous and exotic breed components
	1.3 Breed replacement with alternative reproduction means (natural & AI)
	1.4 Public and private livestock farms linkages for expanding breed improvement activities
	2.1 Augmenting fodder production with improved seeds and fodder preservation (hay, silage)
	2.2Low cost feed formulations and local feed production (village level enterprises)
	2.3 Village level animal health services through developing a cadre of service providers
	2.4 Promotion of recommended housing and other animal raising practices
	2.5 Modernization of Fish Hatcheries and improved fish feed system
	3.1 Validating and promoting alternative live animal marketing channels
	3.2 Establishment of modern slaughter houses
	3.3 Developing vertical coordination between feed lot fattening farmers and processors/exports
	3.4 piloting meat and fish processing and new market options
	3.5 Development of fisheries for export and tourism
	4.1 Review of existing regulatory and quality control systems
	4.2 Develop new regulatory system in light of 18 amendment and export obligations
	4.3 Suggesting revised price mechanism of live animals and meat
	4.4 Developing livestock insurance schemes

Approaches/Mechanisms	1.1 Exploration of existing high meat animals by species and zones
	1.2 Identification of breeding bulls/rams by species and zones
	1.3 Semen Production and bulls multiplication
	1.4 Training of service providers
	2.1 Fodder and forage seed/plant entrepreneurs
	2.2 Low cost high producing feed formulation
	2.3 Training of local health services providers
	2.4 Knowledge sharing on improved housing
	2.5 Cultivation of fast growing fish species and development of fishing culture
	3.1 Linking meat producers with different meat marketing chains
	3.2 Investmentplan for improving slaughter houses, marketing, hatcheries and fish processing infrastructure
	3.3 Planning vertical linkages for meat value chain
	3.4 Feasibility and investment plan
	3.5Incentives to motivate private sector involvement and development of fisheries resources
	4.1 Review and proposing new regulatory systems
	4.2 Examining federal regulatory system in the light of devolution
	4.3 Reviewing and suggesting more relevant meat pricing systems
	4.4 Livestock insurance product development considering types of meat enterprises
Institutional arrangements	1.1 Livestock Farms, extension, farmers
	1.2 Livestock Farms, extension and farmers
	1.3. Livestock Farms and extension
	1.4 Livestock department, SRSC, FSC, Communities
	2.1 Fodder & livestock department and Private Feed Industry, FSC, SRSP, Communities
	2.2 Fodder & livestock department and Private Feed Industry
	2.3 Livestock department, SRSC, FSC, Ext, Communities
	2.4 Livestock, fisheries engineering departments, Extension, SRSP, FSC, Communities
	2.5 Fisheries Department, Engineering departments, extension
	3.1 Livestock department. SRSC, FSC, super /mini markets
	3.2 Livestock departments, fisheries, city/town governments
	3.3 Livestock department, SRSC, FSC, Super/mini markets. Private entrepreneurs
	3.4 Livestock department, Economic departments, entrepreneurs
	4.1 Law department and livestock department
	4.2 Law department and livestock department
	4.3 Livestock Departments
	4.4 Economic Faculty, farming community livestock department, SRSC, Insurance Industry, Banks
Roles and responsibilities	1.1 Leader: Livestock farms Collaborators: Ext, Farmers
	1.2 Leader: Livestock farms Collaborators: Ext, Farmers
	1.3 Leader: Livestock farms Collaborators: Ext, Farmers
	1.4 Leader: Livestock department Collaborators: SRSC, FSC, Ext, Farming communities
	2.1 Leader: Fodder department Collaborators: Livestock department, Private Feed Industry, SRSC, FSC, Ext, Farming communities
	2.2 Leader: Fodder department Collaborators: Livestock department, Private Feed Industry, SRSC, FSC, Ext, Farming communities
	2.3 Leader: Livestock department Collaborators: SRSC, FSC, Ext, Farming communities
	2.4 Leader: Engineering Department Collaborators: Livestock department SRSC, FSC, Ext, Farming communities
	2.5 Leader: Fisheries department, SRSC, FSC, Ext, Farming communities
	3.1Leader: Livestock department Collaborators: Mini/Super markets, SRSC, FSC, Ext, Farming communities
	3.2 Leader: City town Govt. Collaborators: Livestock department, fisheries department
# of locations	Eight high meat production districts in four zones will be selected for implementing meat value chain pilots schemes
# of demonstrations	Four demonstration sites in each of 8 selected district (32 demonstrations)

Partners/Recipients	Livestock farms, Livestock department, Livestock extension, fisheries department, SRSC, FSC, Super/mini markets. Private entrepreneurs
Outputs	∞ High producing indigenous and cross breeding programs developed
	∞ Breed specific feeding resources developed for quality livestock and fish meat production
	∞ New market chain developed for raw and processed meat and fish
	∞ Regulatory framework developed considering new ground realities
	∞ Around 320 animal health and breeding services providers trained
	∞ Introduce 2 pilot fish processing plant and 50 community fish farms backed with technical support
Outcomes	‡ Meat production augmented by identifying potential local breeds and best cross bred combinations
	‡ Feed resources developed in accordance with the animal strength
	‡ Meat marketing system improved
	‡ Rules framed to enhance quality meat availabilities
	‡ Sustainable fish production to meet increasing demand of fresh and cold water fish
Indicators of success	• Total 32 demonstrations sites developed in coordination with all partners for livestock meat and 2 pilot fish processing plants integrated with community fish farms
	• A critical mass of high meat producing animals identified
	• Best combination suitable to local situations of animal crosses identified
	• Animal production services available at accessible locations
	• new rule framed to ensure fair prices to producer and quality products to consumer
Timeframe	3 years
Assumption	• Identification of leadership roles
	• Additional resources availability from donors and government
	• Industry and partners commitments
	• Continuity of services providers
	• Representative sites
	• Involvement of decision makers at service centers

Annex 4

Box: Strengthening and Development of the University Of Agriculture, Peshawar

Established in 1981, the University of Agriculture, Peshawar has been playing a vital role in producing skilled human resource, through imparting quality agricultural education and undertaking applied research in the field of agriculture and allied sciences for ensuring sustainable development in the sector. The University has five faculties in the fields of Crop Production, Crop Protection, Human Nutrition, Social Sciences, Animal Husbandry and Veterinary Sciences, all containing 24 Departments and three Institutes including Biotechnology and Genetic Engineering, Development Studies and Agro-Management Sciences.

The University contains a total of 368 faculty, out of which 178 are Ph.Ds mostly from the technologically advanced countries of the world including USA. Most faculty are holding the Post Doc Degrees in varied fields ranging from pure scientific/ technical approaches towards highly influential social and rural development pursuits. All of these faculty members are contributing in enhancing the knowledge base of our students by facilitating them in attaining their postgraduate and Ph.D degrees and directly culminating towards production of highly skilled man power in this important field of our economy.

The University has initiated the Ph.D. programme in 1997, more than 90 PhDs have so far been produced and about 200 students are pursuing their Ph.D. programme in different fields of national interest.

The Agricultural Policy is based on innovation and value addition of agricultural commodities and these two factors necessitate the strengthening and updating academic and research facilities of the University of Agriculture, Peshawar, being a key stakeholder. The skilled human resource that will be required down the road to implement the strategic actions would be provided with enhanced funding so that the faculty can be trained through PhDs and Post Docs, up gradation of laboratory facilities at par with international standards, infrastructural environment and effective coordination mechanisms with national and international organizations.

Moreover, with the enhanced patronage of the Provincial Government in terms of physical and financial support, the University of Agriculture, Peshawar will be in a much better position to produce quality research that will ultimately contribute in the socio-economic development of the province. Also the research and extension officials of the Agriculture Department would be provided on the job learning facilities so that they become effective in utilizing their services for the Government.