

Islamic Republic of Pakistan

Data Collection Survey on Agriculture Sector
in Punjab and Khyber Pakhtunkhwa Provinces

Final Report Summary

August 2016

Japan International Cooperation Agency
Asia Engineering Consultant Co., Ltd.
A&M Consultant Inc.
Kaihatsu Management Consulting Inc.

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Abbreviations

Initial	Abbreviation	Official Name	
A	ADB	Asian Development Bank	
	AFP	Agro Food Processing	
	AGAHE	Association for Gender Awareness and Human Empowerment	
	AHITI	Animal Husbandry In-Service Training Institute	
	AI	Artificial Insemination	
	AKHU	Akhuwat	
	AMFB	Apna Microfinance Bank Ltd.	
	AO	Agriculture Officer	
	AO	Agriculture Officer	
	AR	Adaptive Research	
	ASA	ASA Pakistan	
	ATI	Agriculture Training Institute	
	B	BEDF	Badbaan Enterprise Development Forum
		BRAC	BRAC Pakistan
	C	CABI	Centre for Agriculture and Biosciences International
CBO		Community Based Organization	
CEDAW		Convention on the Eliminate of All Forms of Discrimination against Women	
CO		Community Organization	
D	DFID	Department of International Development	
	DRDF	Dairy and Rural Development Foundation	
E	EFA	Education for All	
	ELISA	Enzyme-linked Immunosorbent Assay	
	EU	European Union	
	EXT	Extension	
F	FA	Field Assistant	
	FAO	Food and Agriculture Organization of the United Nations	
	FATA	Federally Administered Tribal Areas	
	FFO	Farmers Friend Organization	
	FFS	Farmer Field School	
	FMD	Foot and Mouth Disease	
	FMFB	The First Micro finance Bank Ltd.	
	FINCA	FINCA Microfinance Bank	
G	GBTI	Ghazi Barotha Taraqiati Idara	
	GBV	Gender based violence	
	GDP	Gross Domestic Product	

	GGI	Gender Gap Index
	GMIS	Gender Management Information System
	GPI	Gender Parity Index
H	HIES	Household Integrated Economic Survey
I	ICT	Islamabad Capital Territory
	IFAD	The International Fund for Agricultural Development
	IPM	Integrated Pest Management
	IWMI	International Water Management Institute
J	JEN	Japan Emergency NGO
K	KASHF	Kashf Foundation
	KB	Khushhali Bank
	KP, KPK	Khyber Pakhtunkhwa Province
L	L&DD	Livestock and Dairy Development Department
	LFES	Livestock Farmer Field School
	LSO	Local Support Organization
M	MDGs	Millennium Development Goals
	MLEW	Man/Men Livestock Extension Worker/s
	MOJAZ	MOJAZ Foundation
N	NARC	National Agricultural Research Centre
	NGO	Non-governmental organization
	NRSP	National Rural Support Programme
	NRSP-B	National Rural Support Programme Bank Ltd.
O	ODC	Organization for Development Cooperation
	OFWM	On Farm Water Management
P	PBS	Pakistan Bureau of Statistics
	PCR	Polymerase Chain Reaction
	PCSW	Provincial Council on the Status of Women
	PHKN	Pakistani Hoslamand Khawateen Network
	POMFB	Pak-Oman Microfinance Bank Ltd.
	PPR	Peste des Petitis Ruminants
	PRSP	Punjab Rural Support Programme
	PSLM	Pakistan Social and Living Standards Measurement
R	RI	Relief International
	Rs.	Pakistani Rupees
S	SDC	Swiss Agency for Development and Cooperation
	SDS	Saath Development Society
	SMS	Subject Matter Specialist
	SPPAP	South Punjab Poverty Alleviation Project

	SRSP	Sarhad Rural Support Programme
T	TMFB	Tameer Microfinance Bank Ltd.
U	UBank	U Microfinance Bank Ltd
	UC	Union Council
	UNDP	United Nations Development Programme
	USAID	US Agency for International Development
V	VA	Veterinary Assistant
	VO	Veterinary Officer
	VOrg	Village Organization
W	WLEW	Woman/Women Livestock Extension Worker/s
	WMFB	Waseela Microfinance Bank Ltd.
	WUA	Water Users' Association

Part I

Report on the Survey in Khyber Pakhtunkhwa Province

Chapter 1 Agriculture Policy

1-1 Related agriculture policies, position, and priority challenges

1-1-1 Agriculture sector

“The Agriculture Policy - a Ten Years Perspective’ for Khyber Pakhtonkhwa (2013-2023)” was formulated by the FAO in 2013. The policy is composed of following major strategies.

- 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
- Improve national resource management, adaptation to climate change and disaster risk management

1-1-2 Livestock sector

The livestock development policy of the federal government is stipulated in Chapter 8 of the Annual Plan 2013-2014. Framework for Economic Growth (2011) provides guidelines for improvement in agricultural productivity and ensuring food security based upon required reforms, improved sector governance, adoption of institutional reforms and innovations, upgrading of agriculture marketing systems, improved trade and competitiveness and sustainability of the system. Livestock sector can contribute effectively in the development of the national economy and achievement of the goal of high growth in meat, dairy and poultry production.

On the other hand, the livestock development policy of KPK has been under preparation by the Provincial Livestock and Dairy Development Department (L&DD) and the priority challenges are the following fields; 1. animal health and control of diseases, 2. disease surveillance and reporting, 3. breed improvement, 4. extension services, 5. research and development, 6. poultry production, 7. feed and fodder, 8. vaccine production, 9. live animal and poultry markets, 10. meat production and processing, 11. animal welfare, 12. rangeland development, and 13. environmental protection.

1-2 Organizational structure of the provincial government

1-2-1 Agriculture sector

(1) Structure of Agriculture Department

There are the following five directorates under the Agriculture Department in KP, and five directorate offices are being established in each district.

- Soil management
- Water management
- Agriculture research
- Agriculture statistics
- Agriculture extension

The structure of the Agriculture Extension Office in each district is as follows. Under the District

Director Agriculture, there are three Subject Matter Specialists (SMS) who lead the subject fields as follows:

- Agronomy Extension
- Horticulture
- Soil protection

Also, there are a couple of Agriculture Officers (AO) under the Director, and each AO is responsible for the extension of each Circle of the District and management of other workers such as Field Assistants and Field Workers. Figure 1-1 depicts the structure of Agriculture Extension Section in Abbottabad.

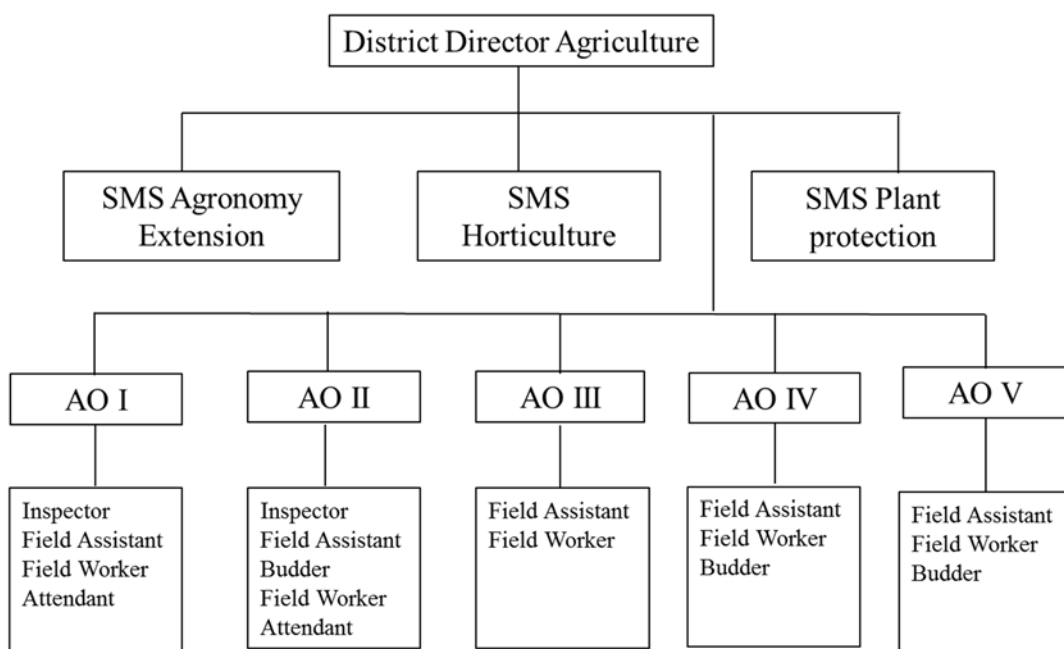


Figure 1-1. Structure of Agriculture Extension Section in Abbottabad

(2) Annual Budget for Agricultural sector in KP

The total provincial budget of Khyber Pakhtunkhwa increased by over 65% between 2008/9 and 2010/12. Over the same period the amount allocated to agriculture doubled but still accounts for only 2.2% of the total budget, which is very small when compared to the share of agriculture in the economy (22% of GDP).

(3) Policy measures for agriculture

The major projects of Agriculture Department in recent years include the following.

(i) Variety improvement

The Research and Development section of the Department in KP has been conducting the breeding of major crops of KP. The improved varieties crossed by the Department include the following.

Table 1-1: New Varieties crossed by Agriculture Department

Crop	Variety name
Wheat	KT-2010, Siran 2010, Amin 2010
Onion	Tirchmir
Orange	Sher Khana, Tarnab Malta
Sugarcane	KB 2010
Apple	Gala Must
Cherry	Stilla

Source: Homepage of Agriculture Department

(ii) Provision of certified seeds to farmers

The Department has been providing certified seeds of wheat and maize to farmers at lower prices. In 2015, they started to give it at free of cost to the farmers with more than 1 acre of farmland.

(iii) Promotion of the plantation of horticulture products

The Department has been promoting the plantation of horticulture products which are suitable for each district. For example, in Abbottabad, the Department grows the seedlings of apple, apricot, litchi, guava at their nursery. They provide these seedlings to farmers at low prices and also provide technical assistance to the farmers.

(iv) Establishment of Model Farm Service Center and support on its management

A Model Farm Service Center was established in each district of KP in 2009. These facilities are collectively managed by the member farmers and their major activity is the collective purchase of agricultural inputs and machinery.

When the centers are established, the government provides the land and the facilities and a revolving fund of Rs4,000,000.

The Agriculture Department has recently given agriculture machinery such as tractors and sprays to the centers under the Farm Mechanization Project.

(4) Challenges for agriculture policy and the structure of the Agriculture Department

Challenges for agriculture policy and the structure of the Agriculture Department are as follows

- The new Agriculture Policy was formulated in 2013, but it has not been reflected to the policy measures of the Agriculture Department. It is not clear if the Department will be given enough budget to implement the strategies of the policy.
- The new Agriculture Policy aims to promote the commercialization and the formulation of strategy of agriculture base on value chain analysis, but the Department lacks the skills and experience to implement it.
- The numbers of Agriculture Officers and Field Officers are very small compared to the numbers of farmers in KP, so the extent of their extension works is quite limited.

The main targets of the extension activities of the Agriculture Department are farmers with more than 1 acre of land, while support to the marginal farmers which is predominant in KP is limited.

1-2-2 Livestock sector

The Provincial L&DD is in charge of administration of the livestock sector in KP and divided into two wings, Extension and Research (check the Figure 1-2). The former provides services on animal health and each district government also has L&DD under the Directorate of Animal Health & Production of the Provincial L&DD. On the other hand, the latter has Veterinary Research Institute in Peshawar and locates Veterinary Research & Disease Investigation Centers and Livestock Research & Development Stations in the regions.

The mission of the Extension Wing is as follows; 1. treatment and control of animal diseases (mainly by the district L&DDs), 2. control of zoonotic diseases (such as Crimea Congo hemorrhagic fever and avian influenza), 3. development of livestock and poultry genetic resources (including production of frozen semen), 4. development of entrepreneurship and market interventions, 5. capacity building of the stakeholders (mainly at Animal Health In-service Training Institute: AHITI), 6. collaboration with partner organizations, and 7. relief activities in disasters/calamities.

In the districts, L&DD is providing the services such as veterinary treatment, artificial insemination (AI) and vaccination by veterinary officers (VOs) and veterinary assistants (VAs) posted at veterinary hospitals, dispensaries and centers including mobile clinics. In addition, the veterinary hospital located in the headquarters has a diagnostic laboratory providing basic diagnostic services to farmers.

The major mission of the Research Wing is to research activities for livestock development, however, it also includes vaccine production, emergency response to disease outbreaks, disease investigation, postmortem examination, training of farmers, internship for students, etc.

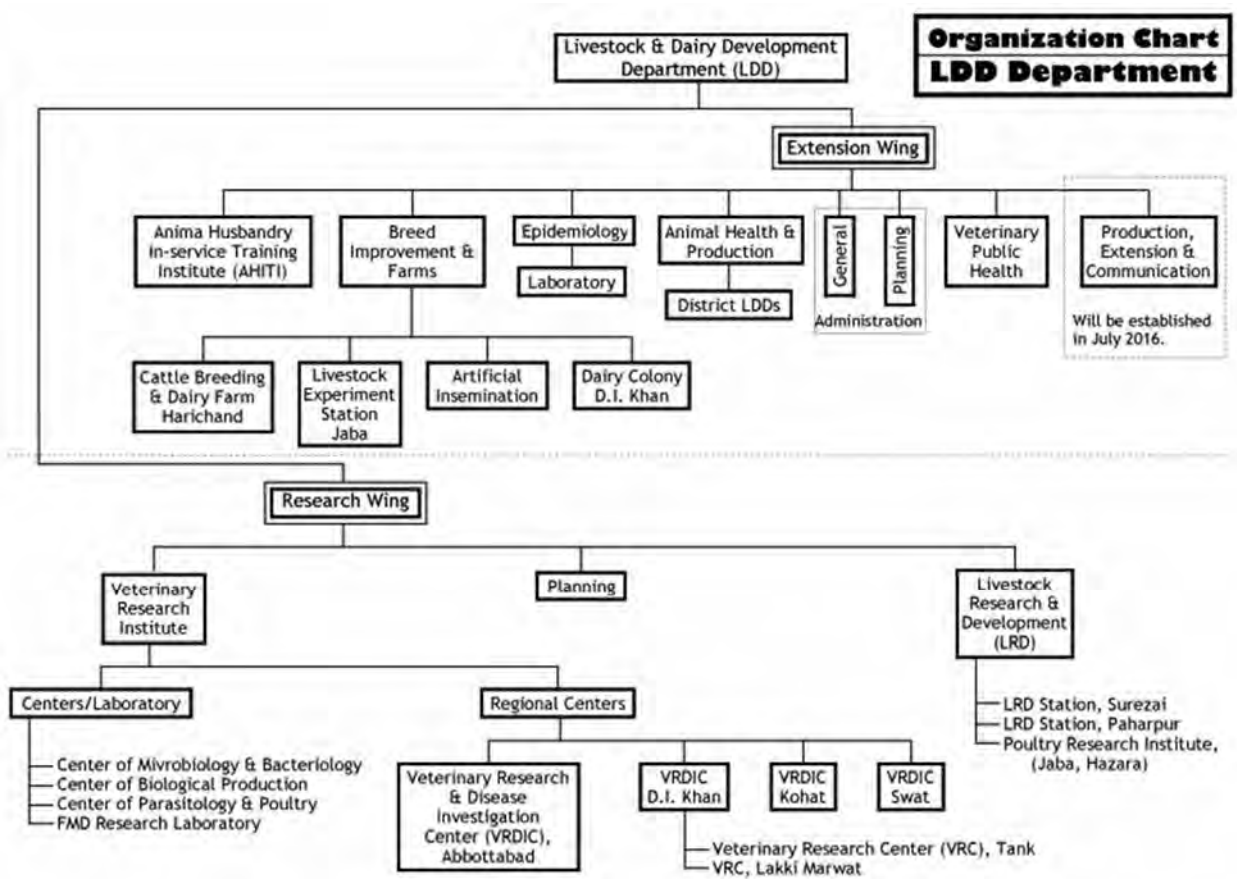


Figure 1-2. Organizational Structure of the Provincial L&DD

Chapter 2 Natural and Social Conditions

2-1 Nature

The KPK is largely located on the Iranian plateau and Eurasian land plate, while peripheral eastern regions are located near the Indian subcontinent and this has led to seismic activity in the past. It covers an area of 74,521 km² (28,773 sq. mi). According to the 1998 census, the total population of KPK was approximately 17 million out of whom 52% are males and 48% females. The density of population is 187 per km² and the intercensal change of population is of about 30%. The northern zone is cold and snowy in winter and has pleasant summers with heavy rainfall except for Peshawar basin, which is hot in summer and cold in winter. It has moderate rainfall. The southern zone is arid with hot summers and relatively cold winters and scanty rainfall.

In Pakistan large-scale floods caused serious damage in 1988, 1995 and 1997, and KPK also recently suffered in 2010 and 2015. Especially the flood along the Indus in 2010 caused a great loss that extended to the Punjab Province. In response to the floods the Provincial L&DD implemented emergency support such as establishment of campsites, animal health services and provision of feed.

2-2 Social infrastructures

KPK has established as many primary schools as in Japan (22,000), which is considered to be quite a few. However, the numbers of middle and high schools are 1/4 and 1/2.5 compared those in Japan. Especially the number of high schools for girls remains only 1/3 of the number of boys' schools, which implies that the condition of higher education for girls hasn't been primed yet.

Availability of hospitals is much worse in KPK than in Japan. The total number is only 157 and the surveyed three districts have around 10 respectively (no private hospitals) while over 9,000 hospitals (60% is private) are functioning in Japan. The numbers of beds per 1,000 of population is 1.13, 1.64 and 0.64 in Abbottabad, Haripur and Mansehra respectively, while it is 8-9 in the advanced countries.

2-3 Economic infrastructures

(1) Electricity

Table 2-1 indicates the quantities of generation and consumption of electricity in Pakistan and KP. It shows that the quantity of electricity generation in KP is only 4% of all Pakistan. The per capita consumption of electricity in KP is about 25% lower than the average of Pakistan.

Table 2-1. Quantities of generation and consumption of electricity in Pakistan and KP (2013-2014)

	Unit	Pakistan	KP	% share of KP
Generation	Million KWH	96,497	3,930	4.07
Consumption	Million KWH	76,789	8,455	11.01
Per capita consumption	KWHs	420	316	-

Source: Development Statistics KPK 2015

(2) Gas

Table 2-2 shows the number of facilities which have access to gas. It indicates that the number of households which utilize gas has been increasing. As the estimated number of households in KP in 2014 is about 3,541,000 (according to Development Statistics KP 2015), about 15% of total households in KP are estimated to have access to gas.

Table 2-2. Number of facilities which have access to gas in KP

Year	Total	Household	Commercial	Industrial/Bulk
2011-2012	530,311	520,724	8,757	830
2012-13	557,160	547,610	8,709	841
2013-14	585,398	575,884	8,661	852

Source: Development Statistics KPK 2015

(3) Transportation

Table 2-3 shows the railway track length in Pakistan and KP. The length of railways in KP constitutes only 3.2% of total length of railways in Pakistan.

Table 2-3. Railway track total length (Km, 2010-2011)

Pakistan	KP	% share of KP
11,755	379.4	3.23

Source: Development Statistics KPK 2015

Table 2-4 shows the total length of roads in KP and Pakistan. The total length of roads in KP constitutes about 7% of total roads in Pakistan.

Table 2-4. Length of road in Pakistan and KP (Km, 2013-2014)

	Pakistan	KP	% share of KP
Total	263,415	19,381	7.36
High type	182,900	14,808	8.1
Low type	80,515	4,573	5.68
Road Per Sq.Km Of Area	0.33	0.26	-

Source: Development Statistics KPK 2015

2-4 Geographical locations

KP is located northwest of the capital of Pakistan, Islamabad. The capital of KP, Peshawar, is connected to Islamabad by a highway (Islamabad Peshawar Motorway), and it takes about three hours' drive between the

two cities. Some major cities of the Southern KP such as Bannu and D.I.Khan are located along N-55, the major road from Peshawar to Balochistan. Also, some major cities of Northern KP such as Abbottabad, Haripur, and Mansehra are located along the Karakorum highway which extends from Islamabad to Gilgit-Baltistan.

2-5 Employment opportunities inside and outside villages

The employment opportunities inside villages in KP is quite limited. Many of the young people in rural areas work as unskilled workers for construction. As infrastructure projects are quite rare, house construction is the major work for them. The daily wage of unskilled labor for construction is usually Rs.300 per day. During harvesting period of major crops such as wheat and maize, there is high demand for agriculture labors. The wage for unskilled agriculture laborer is also Rs.300 per day. Some of the people who have higher education work as teachers or public servants, but these posts are quite limited in rural areas.

A lot of young people work as unskilled labors in major cities in Pakistan such as Islamabad, Lahore, and Karachi or even in the foreign countries. Also, some of them work for the army or navy. The remittances of these people who work outside constitute a significant part of household income in rural KP.

Chapter 3 Major Agricultural Products and Livestock

3-1 Agriculture

(1) Environment

(i) Agro-ecological zones

The KP is divided into the following four agro-ecological zones

- Northern Irrigated Plain: Charsadda, Hangu, Kohat, Mardan, Nowshera, Peshawar, Swabi
- Barani (rainfed) Land: Bannu, D.I.Khan, Karak, Lakki, Tank
- Wet Mountains: Abbottabad, Battagram, Haripur, Kohistan, Mansehra
- Northern Dry Mountains. Buner, Chitral, Dir Lower, Dir Upper, Malakand, Shangla, Swat

(ii) Land Cover

Figure 3-1 shows the status of land cover in KP. One can see that the vegetation in KP is highly diversified. Large-scale irrigated cropland (11) extends in the central areas of KP. Some other irrigated cropland can be found in D.I.Khan, Tank, Bannu, and Kohat. In the northern regions of KP, there are large areas of grasslands (140-Closed to Open grassland), and broad leaved forests (40-Closed to open broad leaved evergreen or semi-deciduous forest) are extended in the south of these areas. Also, there are large areas of bare lands (200-Bare Area) in Lakki Marwat and adjacent areas. Most of the other areas are covered by rain-fed croplands (14-Rainfed croplands) and Mosaic vegetation (20-Mosaic croplands/vegetation).

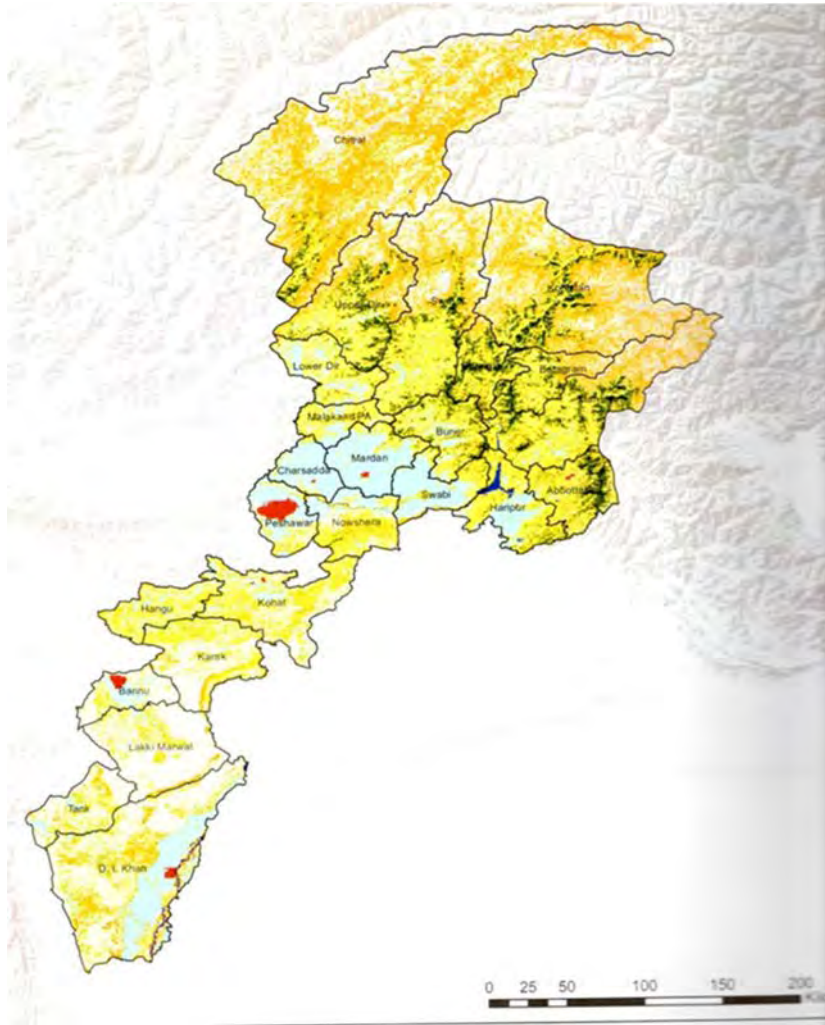


Figure 3-1: Land cover of KP

Source: Kyber Pakhtunkhwa Agriculture Atlas 2012

(2) Agricultural production

(i) Growth rate of sectoral value-added

Between 1991/92 and 2004/05 the value-added of whole agriculture sector (including livestock, fishery, and forestry) in KP had increased by 2.2% annually which is much lower than the annual growth rate of that sector in all Pakistan (3.0%). Yet the annual growth rate of crop sector in KP during these periods is 2.9% which is almost same as the annual growth rate of that sector in Pakistan (3.0%).

(ii) Areas of farm and cultivated land

Table 3-1 depicts the land utilization of farmland in each province of Pakistan. It shows that KPK holds about 10% of total cultivated land in Pakistan.

Table 3-1. Land utilization of farm area in each province of Pakistan (2010, Acre)

	Number of farms	Area of farms	Area of cultivated land
Pakistan	20,421,975	52,911,553	42,623,402
KPK	3,805,000	5,569,815	4,453,170
Punjab	12,972,548	29,327,065	27,034,599
Sindh	2,755,929	9,869,011	7,643,693
Balochistan	888,497	8,145,663	3,491,940

Source: Agriculture Census 2010

(iii) Scale of farm

According to Agriculture Census 2010, In KPK, about 63% of the farms are smaller than 2.5 acres, whereas this number is 43% in Pakistan. Also, the average size of the farms is 3.6 acres in KP, much smaller than the average of Pakistan, 5.2 acres. The prevalence of small-scale farms is one of the major characteristics of the agriculture in KP.

(iv) Major crops

Table 3-2 shows the cultivated areas, quantities of production, and yields of major crops in KP in 2013-14. It shows that maize is the major commodity in the Kharif period while wheat is the major Rabi commodity in KP. The major cash crops include sugarcane and tobacco.

Table 3-2. Cultivated areas and production of major crops (2013-2014)

		<i>Total</i>		<i>Irrigated area</i>		<i>Unirrigated area</i>		<i>Yield per acre</i>	
		<i>Area</i>	<i>Production</i>	<i>Area</i>	<i>Production</i>	<i>Area</i>	<i>Production</i>	<i>Irrigated area</i>	<i>Unirrigated area</i>
Kharif	Maize	1104.2	887.06	453.9	463	650.4	424.1	1.0	0.7
	Sugarcane	287.0	5331.93	284.3	5328	2.7	3.72	18.7	1.4
	Rice	109.8	95.95	109.8	95.95	0.0	0	0.9	
	Fruits	75.9	273.9	75.9	273.9	0.0	0	3.6	
	Vegetables	55.1	177.33	55.1	177.3	0.0	0	3.2	
	Ground nut	15.7	8.19	0.6	0.34	15.1	7.85	0.6	0.5
	Jowar	7.6	2.34	3.2	1.1	4.5	1.24	0.3	0.3
	Bajra	7.1	1.63	1.8	0.55	5.3	1.08	0.3	0.2
	Cotton	0.6	0.13	0.6	0.13	0.0	0	0.2	
	Pulses	0.6	0.09	0.0	0.01	0.6	0.09	0.2	0.2
Sesamum	0.2	0.03	0.0	0.01	0.1	0.03	0.2	0.2	
Rabi	Wheat	1681.1	1251.46	747.6	707.92	933.4	543.54	0.9	0.6
	Gram	90.6	21.55	15.7	5.96	74.9	15.59	0.4	0.2
	Tobacco	80.3	78.21	80.3	78.21	0.0	0	1.0	
	Vegetables	34.3	172.7	34.3	172.7	0.0	0	5.0	
	Barley	28.2	11.76	12.1	6.35	16.1	5.41	0.5	0.3
	Rape seed and Mustard	25.5	5.75	7.8	2.26	17.7	3.49	0.3	0.2
	Onion	22.2	163.94	20.6	155.6	1.6	8.36	7.6	5.1
	Fruits	17.6	62.48	17.6	62.48	0.0	0	3.6	
	Potato	3.0	12.63	1.8	8.06	1.2	4.57	4.5	3.9
	Pulses	0.1	0.03	0.1	0.03	0.0	0.001	0.2	0.2

Source: Development statistics of KPK 2015

(v) Production trend of major crops

(a) Wheat

There was significant increase in the production of wheat in Pakistan between 1991 and 2008, but its production in KP did not increase. One reason for this difference was the significant increase of cultivated areas of wheat in Punjab and Sindh. Also, the pace of productivity increase was slower in KP than other provinces, due to the slow spread of high yield seeds, fertilizer, and pesticide in KP.

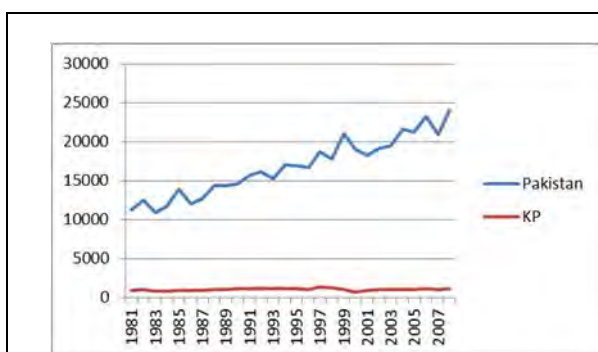


Table 3-3. Production of wheat in Pakistan and KP (thousand ton)

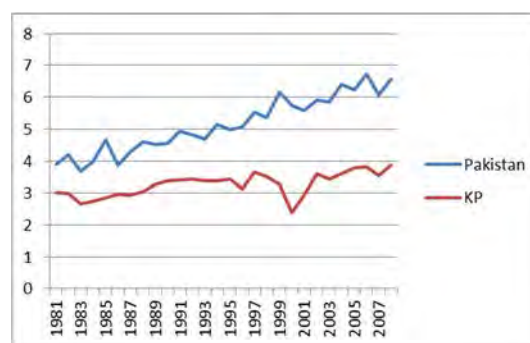


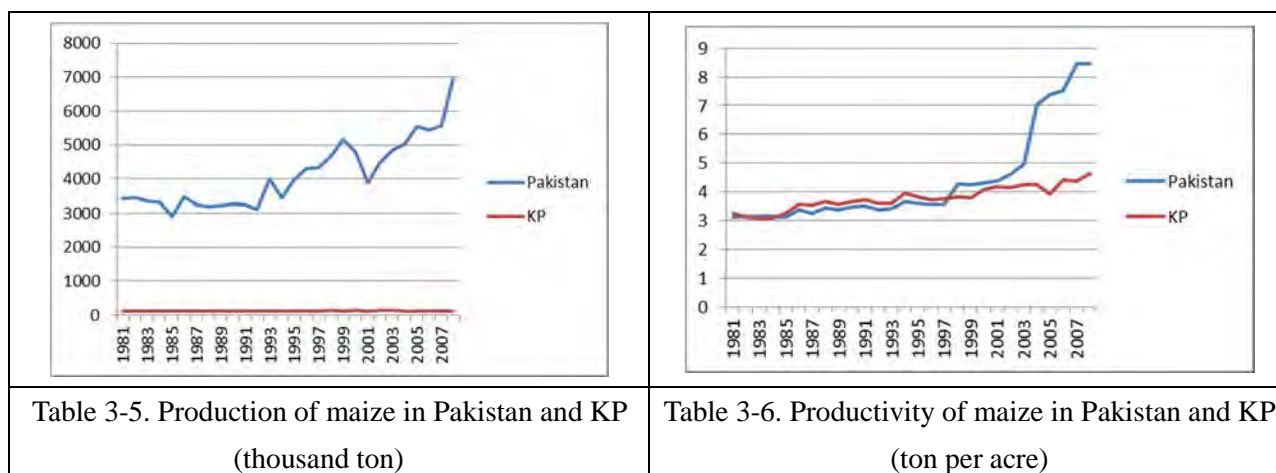
Table 3-4. Productivity of wheat in Pakistan and KP (ton per acre)

Source: Agriculture Statistics Area and Production By Districts for 28 Years

(b) Maize

There was significant increase in the production of maize in Pakistan between 1991 and 2008, but its production in KP did not increase. Major reason for this difference was that the pace of productivity

increase was slower in KP than other provinces, due to the slow spread of high yield seeds, fertilizer, and pesticide in KP.



Source: Agriculture Statistics Area and Production By Districts for 28 Years

(vi) Vegetable

Table 3-7 shows the area of cultivation, quantity of production, and productivity of vegetables in Pakistan and KP in 2012-13. For most of the items, the quantities of production in KP were about 10% of total production in Pakistan. Yet, the production of tomatoes in KP in the Karif period constitutes 62% of total production in Pakistan.

Table 3-7. Cultivation areas and production of major vegetables (2013-2014)

		Pakistan			KP			Production (KP/Pakistan)
		Area under vegetable (acre)	Production (ton)	Yield per acre	Area under vegetable (acre)	Production (ton)	Yield per acre	
Kharif	Tomato	42,025	142,604	3.4	24,619	87,926	3.6	62%
	Lady finger	35,734	110,114	3.1	4,870	16,936	3.5	15%
	Eggplant	22,348	91,126	4.1	3,262	13,654	4.2	15%
	Squash	25,467	94,796	3.7	2,634	12,395	4.7	13%
	Pumpkin	10,079	47,925	4.8	1,816	10,617	5.8	22%
	Bitter gourd	14,809	58,730	4.0	2,585	10,166	3.9	17%
	Arum	4,898	18,232	3.7	1,698	5,567	3.3	31%
	Bottle gourd	14,127	59,842	4.2	1,159	4,175	3.6	7%
	Other	69,385	293,803	4.2	11,817	30,112	2.5	10%
Rabi	Tomato	101,780	431,448	4.2	9,074	43,179	4.8	10%
	Turnip	38,959	276,471	7.1	7,406	42,082	5.7	15%
	Spinach	20,552	100,151	4.9	3,936	17,890	4.5	18%
	Cauliflower	33,050	229,127	6.9	3,348	15,268	4.6	7%
	Radish	25,721	170,366	6.6	2,861	15,196	5.3	9%
	Peas	42,487	113,067	2.7	4,804	13,472	2.8	12%
	Sweet potato	35,282	90,998	2.6	1,567	8,741	5.6	10%
	Cabbage	12,111	76,778	6.3	1,465	5,136	3.5	7%
	Other	583,179	2,980,172	5.1	47,662	214,658	4.5	7%
Patato		430,875	3,802,275	8.8	22,588	125,727	5.6	3%

Source: Fruit, vegetables statistics

Table 3-8 shows the cultivated areas and quantities of production of vegetables in each district in KP. It indicates that the quantities of production of vegetables are relatively larger in Swat, D.I.Khan, Peshawar, Mardan, and Charsadda where there are large areas of irrigated lands.

Table 3-8. Cultivated areas and production of vegetables in each district of KP (2013-2014)

	Kharif		Rabi	
	Area unde vegetable (acre)	Production (ton)	Area unde vegetable (acre)	Production (ton)
Abbottabad	324	348	0	898
Bannu	3,676	2,591	10,581	1,778
Battagram	15,229	338	21,135	0
Buner	2,333	6,677	29,302	4,282
Charsadda	4,109	20,816	26,890	8,553
Chitral	3,914	4,828	10,294	11,858
D.I.Khan	1,691	5,692	9,622	10,882
Dir Lower	800	8,280	1,285	4,166
Dir Upper	3,487	4,119	7,077	3,894
Hangu	67	1,354	44	520
Haripur	3,645	4,636	3,929	2,864
Karak	470	46	1,515	18
Kohat	568	6,495	3,123	1,590
Kohistan	2,748	365	31,985	613
Lakki Marw	5,263	566	38,254	1,264
Malakand	7,187	4,137	38,375	12,944
Mansehra	6,442	4,552	7,878	15,481
Mardan	9,886	13,061	25,506	15,530
Nowshera	1,557	7,899	2,076	3,188
Peshawar	1,649	17,727	19,039	10,322
Shangla	30,231	2,995	95,309	840
Swabi	8,463	2,780	15,106	7,705
Swat	0	49,585	0	38,570
Tank	0	2,323	0	6,113

Source: Crops statistics 2012-13

(vii) Fruits

Table 3-9 shows the cultivated areas, quantities of production, and the productivities of fruits in Pakistan and KP. It indicates that the major fruits cultivated in KP include apples, melons, and guava. The table also shows that the quantities of production of peaches, plums, pears and walnuts constitute more than 50% of total production in Pakistan.

More than 80% of fruits farms in KP are less than 1 acre whereas 64% of fruits farmers in Pakistan are less than 1 acre.

Table 3-9. Cultivation areas and production of major fruits (2013-2014)

	Pakistan			KP			Production (KP/Pakistan)
	Area under fruits	Production (ton)	Yield per acre	Area under fruits	Production (ton)	Yield per acre	
Apple	256,570	556,307	2.2	19,677	91,483	4.6	16%
Melon	114,948	583,820	5.1	12,180	65,144	5.3	11%
Guava	162,328	471,387	2.9	8,958	43,169	4.8	9%
Peach	34,634	55,621	1.6	15,639	36,097	2.3	65%
Citrus	479,347	2,001,685	4.2	10,265	33,289	3.2	2%
Plum	16,697	55,701	3.3	7,556	27,316	3.6	49%
Persimmon	7,339	24,355	3.3	7,339	24,355	3.3	100%
Pear	4,781	18,789	3.9	4,401	18,181	4.1	97%
Apricot	68,043	178,489	2.6	4,826	14,102	2.9	8%
Banana	66,533	104,927	1.6	1,678	13,066	7.8	12%
Dates	221,406	524,612	2.4	3,702	10,960	3.0	2%
Walnut	3,000	9,926	3.3	3,000	9,926	3.3	100%
Loquat	3,872	9,304	2.4	1,762	4,718	2.7	51%
Mango	432,654	1,680,388	3.9	865	2,964	3.4	0%
Papaya	3,521	6,932	2.0	1,349	2,544	1.9	37%
Pomegranate	27,641	46,081	1.7	576	2,437	4.2	5%
Mulberry	1,260	2,325	1.8	544	1,103	2.0	47%
Almond	26,129	22,330	0.9	479	1,775	3.7	8%
Grape	37,763	64,353	1.7	343	1,072	3.1	2%
Fig	301	494	1.6	156	388	2.5	79%
Ber	13,074	25,634	2.0	NK	NK	NK	NK
Coconut	3,670	10,010	2.7	NK	NK	NK	NK
Cherry	2,632	1,981	0.8	NK	NK	NK	NK
Litch	729	1,811	2.5	NK	NK	NK	NK
Pistachio	477	659	1.4	NK	NK	NK	NK
Other	35,576	62,618	1.8	3,479	14,082	4.0	22%
Total	2,025,155	6,520,813	3.2	107,424	415,627	3.9	6%

Source: Fruit, vegetables statistics

Table 3-10 shows the quantities of production of fruits in each district in KP. One can see that a variety of fruits are cultivated in KP.

Table 3-10. Quantities of production of major fruits in each district of KP (2013-2014)

	Apple	Melon	Guava	Peach	Citrus	Plum	Persimmon
Abbottabad	4,662	0	0	175	0	360	144
Bannu	17	0	9,817	0	26	148	0
Battagram	553	0	50	121	197	148	0
Buner	65	0	25	1,037	613	594	1,088
Charsadda	24	1,406	579	679	381	2,676	2,268
Chitral	780	32	0	100	28	0	42
D.I.Khan	330	10,613	5,492	0	2,837	0	0
Lower Dir	318	0	0	35	2,397	449	549
Upper Dri	878	0	0	738	1,628	1,346	709
Hangu	0	0	213	35	285	65	0
Haripur	35	300	2,284	1,030	2,266	963	0
Karak	0	0	0	0	0	0	0
Kohat	0	0	17,321	0	428	92	0
Kohistan	0	0	0	0	0	34	0
Lakki Marwat	0	24,083	147	0	133	0	0
Malakand	83	0	1,894	0	4,310	590	1,240
Mansehra	5,208	0	45	409	220	799	127
Mardan	7	3,386	519	3,684	2,559	2,161	1,119
Nowshera	280	2,800	7,288	750	2,058	2,956	2,497
Peshawar	0	451	335	895	751	4,396	600
Shangla	289	0	16	408	140	143	696
Swabi	51	704	452	296	2,441	2,745	444
Swat	30,500	0	0	16,875	4,055	3,660	9,690
Tank	35	2,250	450	0	28	0	0
Major areas of production	North	Central South	Central South	Norh	Most of KP	Central North	North

	Pear	Apricot	Banana	Date	Loquat	Mango	Almond	Grape
Abbottabad	28	62	0	0	0	0	0	6
Bannu	0	0	10,026	231	263	14	0	0
Battagram	49	60	124	0	203	0	0	0
Buner	326	409	0	0	0	0	0	0
Charsadda	1,611	889	0	40	99	0	0	0
Chitral	236	424	0	0	38	0	72	187
D.I.Khan	0	0	968	6,786	0	1,601	0	0
Lower Dir	714	312	0	0	8	0	49	0
Upper Dri	1285	1,000	0	0	0	0	89	0
Hangu	0	65	0	0	0	0	0	0
Haripur	271	390	973	0	156	14	0	0
Karak	0	0	0	0	0	0	0	0
Kohat	0	50	0	0	294	0	0	0
Kohistan	0	0	0	0	0	0	0	0
Lakki Marwat	0	0	35	54	0	0	0	0
Malakand	95	590	3	0	160	140	0	0
Mansehra	181	162	151	0	220	0	0	0
Mardan	3,097	255	62	0	1,302	528	0	0
Nowshera	1,661	1,080	100	30	194	261	0	6
Peshawar	3,906	1,091	8	0	77	0	0	0
Shangla	517	181	0	0	0	0	0	0
Swabi	205	369	77	0	81	92	0	0
Swat	3,700	2,900	0	0	233	0	71	200
Tank	0	0	86	178	0	162	0	0
Major areas of production	North	Central North	Central South	South	Central North	Central South	Northwestern	Northwestern

Source: Fruit, vegetables statistics

(viii) Agricultural inputs

① Water

Table 3-11 shows the status of irrigation in Pakistan and KP. It shows that the rate of irrigated land is much lower in KP than other areas of Pakistan. Extension of irrigation facilities tends to be better for larger scale farms in KP.

Table 3-11. Status of irrigation in Pakistan and KP

	Farm without irrigation		Farm with irrigation facilities (% of irrigated)							
			Under 51%		51%-76%		76%-100%		100%	
Pakistan	1,537,398	19%	146,139	2%	53,327	1%	34,712	0%	6,113,403	78%
KPK	641,253	45%	34,888	2%	13,341	1%	6,358	0%	744,065	52%

Source: Agricultural Census

The extension of irrigation facilities differs significantly from region to region. There are large areas of irrigated lands in the central plains (such as Peshawar, Marda, Charsadda, Swabi), D.I.Khan, and Kohistan, and Swat.

The irrigated lands are scarce both in the Southern region such as Karak, Hangu, Lakki Marwat and

Hazara region such as Abbottabad, Haripur, Mansehra. However, the importance of irrigation differs considerably for both regions. In Haza region, where precipitation is quite high, the risk of draught is very low. On the other hand, in the Southern area, which is arid region, the access to water is quite important for the stability of agricultural activities.

② Fertilizer and pesticide

57% of farms use chemical fertilizer in KP whereas 71% of farms use it in all Pakistan in 2010. Only 9% of farms use pesticide whereas 33% of farms use it in all Pakistan.

③ Agricultural machinery

Table 3-12 shows the rate of ownership for agricultural machinery for the farms in Pakistan and KP. For all kinds of machinery, the ownership rate is lower in KP than all Pakistan. The table shows that the ownership rates tend to decrease for smaller scale farms.

Table 3-12. Rate of ownership for agricultural machinery in Pakistan and KP

	Scale of farm (acre)	Tractor	Thresher	Sheller	Combined harvester	Reaper/Harvester	Spray machine
Pakistan	Total	9%	4%	1%	0%	1%	17%
	Under 1	1%	0%	0%	0%	0%	6%
	1–2.5	2%	1%	0%	0%	0%	14%
	2.5–5	6%	2%	0%	0%	0%	19%
	5–7.5	11%	5%	0%	0%	1%	20%
	7.5–12.5	20%	9%	1%	1%	2%	25%
	12.5–25	28%	14%	2%	1%	3%	28%
	25–50	37%	22%	3%	2%	4%	31%
	50–100	44%	29%	5%	2%	4%	33%
	100-150	47%	31%	7%	2%	5%	32%
150 and above	34%	23%	3%	3%	6%	24%	
KPK	Total	2%	1%	0%	0%	0%	3%
	Under 1	0%	0%	0%	0%	0%	2%
	1–2.5	1%	0%	0%	0%	0%	3%
	2.5–5	2%	1%	0%	0%	0%	4%
	5–7.5	2%	2%	0%	0%	0%	4%
	7.5–12.5	6%	4%	1%	0%	0%	5%
	12.5–25	9%	6%	1%	0%	0%	4%
	25–50	12%	7%	1%	0%	0%	5%
	50–100	18%	13%	3%	1%	1%	7%
	100-150	23%	12%	2%	0%	0%	14%
	150 and above	30%	26%	2%	1%	2%	18%

Source: Agricultural Census 2010

(ix) Challenges for agricultural production

The challenges of agricultural production in KP are as follows.

- The marginal and small-scale farmers are predominant.
- The productivities of major crops such as wheat and maize are lower than other areas of Pakistan. The

low utilization of high yield seeds and irrigation and the small-scale of the farms seem to be the main reasons for it.

- There are a number of farmers who cultivate high-value-added crops such as sugarcane, tobacco and vegetables, but it is difficult for those farmers who do not have access to irrigation to grow these products.

Many of the areas in KP are suitable to grow fruits trees, but the production of fruits does not lead to income generation for farmers in many cases due to the lack of skills and knowledge on post-harvest management, processing, and marketing.

3-2 Livestock

Livestock animals are important to Pakistan's economy, with the sector's total assets estimated to be worth more than US \$19 billion. Contributing approximately 12% to the GDP and more than 50% of value-added in agriculture, livestock products (valued at Rs. 165 billion) are assuming an increasing share of agricultural output, rising from 25% in 1996 to 52% in 2011-12. The estimated annual growth in the livestock sector of 3.7% is mainly attributed to increasing value of livestock products. Dairy products contribute 75% to the total value of the sector, and a world dairy indicator price rise of 125% that occurred during the decade is background to the continued strong domestic demand for dairy products. Growth has also been associated with developing markets. Although world meat price rises of 86% over the past ten years have flattened since 2011, meat exports from Pakistan are increasing. The export value of meat of US\$123 million in 2011-2012 was up 14% on the previous year.

Culturally KPK Province is strongly associated with livestock production, as meat and milk are staple food items, and more than 70% of families own ruminant livestock. Rangeland occupying 46% of total land area dominates as the basis for production. Landless producers and traditional subsistence systems with informal marketing arrangements contribute to the status of KPK as the province with the highest poverty rating (39.2% rated poor compared to nationally 34.0%). As production becomes less dependent on rangeland grazing, and more on integrated crop-livestock systems, satisfying local and international demand will require increased efficiency, and transfer of resources from existing agricultural enterprises. So far modern larger-scale systems have had limited impact on production, for example only 9% of buffaloes are managed on a commercial scale.

3-2-1 Production

The numbers of domestic animals reared in KPK are summarized in Tables 3-13 and 3-14. In all KPK the number of cattle is three times the number of buffaloes while both numbers are almost same in the surveyed three districts, which proves that the number of buffaloes in those three districts is more than the other districts in KPK. In fact, the farmers prefer buffalo milk to cow's milk and a majority of small-scale farmers rearing 1-2 animals have buffalo. In addition, numbers increased by 34% for cattle and 27% for Buffalo in eight years between 2006 and 2014.

Table 3-13. Number of domestic animals reared in KPK (Livestock Census 2006, Unit: 1,000 heads/birds)

	Cattle	Buffaloes	Sheep	Goats	Poultry
Pakistan	29,558.8	27,335.0	26,487.7	53,787.0	73,647.9
KPK	5,967.8 (20.2%)	1,927.5 (7.1%)	3,363.2 (6.4%)	9,599.0 (12.7%)	21,004.1 (28.5%)
Abbottabad	111.4	104.6	13.1	24.5	773.1
Haripur	130.2	106.9	6.8	215.6	683.9
Mansehra	182.0	191.1	86.7	316.8	1,013.6
Total (three district)	423.6	402.6	106.6	556.9	2,470.6

Source: Livestock Census 2006

Table 3-14. Number of domestic animals reared in KPK (2013-14 Estimated, Unit: 1,000 heads/birds)

	Cattle	Buffaloes	Sheep	Goats	Poultry*
Pakistan	39,700	34,600	29,100	66,600	79,900
KPK	8,020 (20.2%)	2,440 (7.1%)	3,690 (12.7%)	11,890 (17.9%)	27,000 (33.8%)

Source: Economic Survey of Pakistan 2013-14, * Livestock & Dairy Development Department Peshawar

(1) Animal husbandry

Generally, the animal sheds at small-scale farms are small and dark without appropriate ventilation, which stresses animals and lowers their productivity. The conditions of the animals reared at small-scale farms with poor management are generally undernourished, and nevertheless, they can be improved by small changes derived from record keeping on feed, breeding, milk yield and animal health.

(2) Feed

In the three districts the main feed for animals are straw of wheat and maize, which are the major crops in the region. During the summertime farmers can feed the animals with green grass and also produce hay for the wintertime but the majority of the farmers without their own land have to buy feed for the animals.

(3) Breeding

Cattle and buffaloes are bred by mating or AI. In KPK only 10% of cattle and a few percent of buffaloes are bred by AI (the cost is around Rs. 1,000 for both). The conception rate is also stagnating at around 30-40%, which is very low compared with that in Japan, over 80%. This results in low productivity of the animals as long sterility causes a prolonged dry period.

(4) Animal health

Major infectious diseases are still prevalent in Pakistan and especially foot and mouth disease, hemorrhagic septicemia, brucellosis, mastitis, internal parasites and blood protozoa in large ruminants, peste des petits ruminants, caprine contagious pleuropneumonia, enterotoxemia and internal parasites in small ruminants, and Newcastle disease in poultry are problematic in KPK. However, the current field conditions of prevalent infectious diseases haven't been illustrated due to the limited diagnostic capacity of L&DD.

Among or besides the diseases listed above, zoonotic diseases such as Crimea Congo hemorrhagic fever, highly pathogenic avian influenza, brucellosis and tuberculosis are important in terms of public health. The prevalence of brucellosis in KPK is presented approximately 10% and it was informally reported that 60% of VAs have already been infected with the disease.

3-2-2 Marketing

The marketing system with a flow of collection, processing and marketing through cold chain hasn't been developed in KPK as there are no major milk processing companies or dairy colonies. The small-scale farmers sell the milk to neighbors or retailers. The commercial farmers also sell the milk to retailers or directly to consumers through their own shops as dairy market do not exist in KPK. In case of meat as well, the situation is similar since the meat production industry hasn't been developed. The contribution of livestock to the KPK economy is difficult to measure due to the high level of such informal marketing and processing.

3-2-3 Management

The proportion of small-scale farms with less than 10 cattle or buffaloes is around 95% in Pakistan nationwide including KPK, where 70% of cattle and 83% of buffaloes are reared on those small-scale farms. The farmers usually consume 4-5 kg of milk domestically every day and sell the surplus to earn daily income. Accordingly, increase of animal productivity through improvement of feed, breeding and animal health is inevitable for the farmers.

3-2-4 Product processing

In Pakistan a wide variety of dairy products have been developed in response to high demand for healthy and high-quality products. The dairy product industry has reached 40% of the whole dairy market and is expected to contribute to the Pakistani economy as the profitability of dairy products is high and can attract foreign investment.

3-2-5 Research development

The following two research projects have been ongoing utilizing PC-1 budget by the KPK government.

- (1) Expansion of purebred buffalo breeding farm in D.I. Khan and improvement & conservation of Azikheli buffalo breed with establishment of dairy technology facilities in Khyber Pakhtunkhwa
- (2) Study on the causes of calf mortality and measures to reduce losses in Khyber Pakhtunkhwa

3-2-6 General condition and potential of biomass power generation

The biomass power generation is still in the research phase and hasn't been practically applied to the field. Even the biogas plant using excretion of domestic animals hasn't been introduced to the region probably because it hasn't been recognized as useful and practical by the government and supporting development agencies.

Chapter 4 Community Organization and Extension

4-1 Administrative units/roles, structure and actual state of communities and roles in rural development

Provinces of Pakistan are divided into four administrative units, namely districts, Tehsils (under the districts), Union Councils (under Tehsils), and villages (the smallest unit under the Union Councils). Haripur District of KP Province has two Tehsils and 45 Union Councils, Abbottabad District has two Tehsils and 52 Union Councils, and Mansehra District has three Tehsils and 60 Union Councils.

Distribution of tribes and ethnic groups in KP does not correspond to the administrative units mentioned above. Instead, each group lives across administrative units while sharing common identity. This is because these administrative units have been created in the course of complicated Pakistani history, which is full of political issues¹.

There are several tribes under one ethnic group; for example, Tareen, Tanoli, Jadoon and Tahirkheli under the Hazara ethnic group in Hazara Division. The language spoken by the Hazara ethnic group is Hindko. The smallest unit is a family which is likely to be based on paternal line. The strong tie among families and relatives is the base of the social structure².

After the earthquake in Kashmir in 2005, numerous NGOs presented and created many CBOs in Hazara Division. They are mainly categorized into three types: Traditional community organizations such as Jirga, pre-existing Community Organizations which are created within the community to support the members, and Community Based Organizations (CBO) which are formed by NGOs.

According to the findings from the interviews to CBOs created by World Vision and Pakistani Hoslamand Khawateen Network (PHKN) in the division, Community Organizations play significant roles for improvement of livelihood, empowerment of females as well as community development. For example, a female CBO with 215 members in Abbottabad District received several training courses related to child protection, gender awareness, citizenship, proposal writing to obtain a fund, and disaster reduction by World Vision. Then the female CBO worked to develop a paved footpath with some help from male CBO in the same community. The male CBO provided labor to pave the path while World Vision funded the project. On the other hand, a CBO created by PHKN with 25 members received training to improve their livelihood such as agriculture, kitchen gardening, livestock and sewing by PHKN. The livelihood of a female member interviewed has improved and she feels more confident in herself after joining the CBO.

4-2 Number, role and actual status of diffusion staff in agriculture department

In the Agriculture Extension Department of KP, Agriculture Officers (AO) and Field Assistants (FA) are responsible for extension services for farmers such as distribution of seeds for vegetables, wheat/ maize, and fertilizer, as well as promotion of agriculture technology to increase productivity. It is required to

¹ The Policy of Agriculture and Rural Development Islamic Republic of Pakistan (Final Report), 2005, IDCJ, P. PAK(R)-15-16

² *ibid*, PAK(R)-15-16

have a university degree related to agriculture for the position of AO, and a diploma of a two-year Agriculture Science course from Agriculture Training Institute (ATI) in Peshawar (the course is three years) is required for the position of FA. The Agriculture Extension Department of KP employs 185 male FOs, 15 female FO and 500 male FAs. Table 4-1 shows the number of AOs and FAs in Agriculture Extension Departments in Hazara Division. ATI has not opened the FA course to females; therefore, the department does not have any female FAs in KP. However, ATI has a plan to open the FA course to females.

As for the actual status of extension services, it is observed that the services by AOs and FOs do not reach small-scale farmers due to the shortage of extension staff. However, JICA has been implementing the Project for Capacity Development of Agriculture Extension Services in KP to improve agricultural knowledge and extension skills of extension staff in KP since 2015. The improvement of the extension services by the department is expected.

Table 4-1. Number of AO and FA in Agriculture Extension Department in Hazara Division

District	AO (male)	FO (Female)	FA (male)	FA (Female)
Abbottabad	4	1	20	0
Haripur	3	0	10	0
Mansehra	5	1	34	0

Note: The number of Subject Matter Specialist (SMS) is excluded.

Source: The chart is made by the research team based on the interviews and documents from the Agriculture Extension Departments of the three districts.

4-3 Condition and actual status of extension activity of Livestock and Dairy Development Department

The Livestock and Dairy Development Department (L&DD) of KP Province does not have Extension Department in its organization body. The Veterinary Officer (VO) and Veterinary Assistant (VA) take both roles in animal health and extension services for farmers. However, due to the shortage of extension staff of L&DDs of Haripur, Abbottabad and Mansehra Districts, VO and VA are busy and is difficult for them to spread extension services. Moreover, there are shortages of extension materials and multimedia equipment in the L&DD of the three districts.

The department promotes mobile clinics for VOs to visit farmers for diagnosis, organizes a monthly Field Day to distribute free vaccination and medicines, and provides workshops regarding livestock management for farmers. The equipment and extension training are needed in order to improve the functions of mobile clinic. In addition, L&DD of KP will strengthen AHIT by improving the training modules and methodology in its policy.

The L&DD of KP is planning to establish a new department of Directorate of Production Extension & Communication to enhance extension services in July, 2016. The L&DD plans to hire 186 extension staff who are VOs, VAs and Social Mobilizers in whole KP. It is expected that the extension services of the L&DD will be improved after the establishment of the new department.

The following five countermeasures are suggested to reinforce the extension services by L&DD for the improvement of small-scale farmers' livelihood in the three districts. 1) Improvement of extension services by training the extension staff, building up the extension system within L&DD, and utilizing NGOs that organize CBOs as they are able to work at grassroots level where authorities can hardly reach. 2) Reinforcement of the training contents and system within L&DD. 3) Reconsideration of Livestock Field Farmer School (LFFS) utilization and finding out sustainable way. 4) Improvement of extension materials. 5) Reinforcement of extension activity through media and a campaign to raise awareness of farmers regarding livestock management.

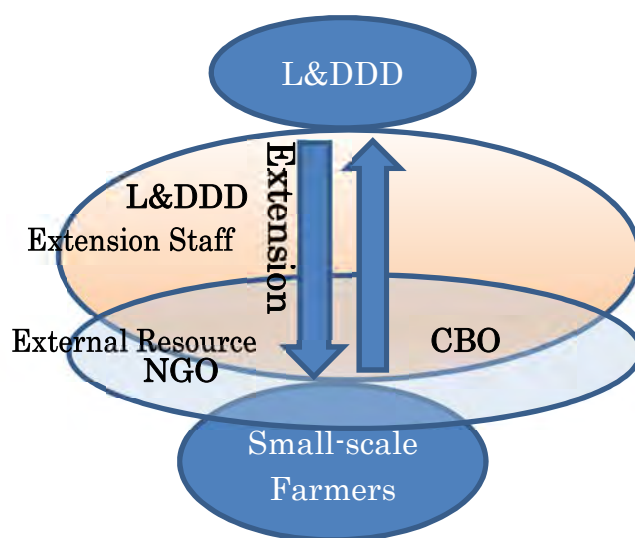


Figure 4-1. Utilization of NGO by L&DD (the figure is created by mission)

4-4 Actual situation and conditions of veterinary officers

The graduates from the Faculty of Animal Husbandry & Veterinary Science of the University of Agriculture are qualified as veterinarians and can apply for the VO position of the L&DD. The total number of VOs in KPK is 360, of which 20 are female. In Abbottabad, Haripur and Mansehra, the numbers of VOs are nine, nine and 15 respectively and only Mansehra L&DD has one female VO. The VOs are in charge of administrative work supervising over the whole district rather than practical Union Council-based fieldwork that is usually conducted by VAs. There are clinical veterinarians working for private veterinary clinics but the number is not sufficient.

4-5 Actual situation and conditions of veterinary assistants

The graduates from the diploma course on Veterinary Science at Agriculture Training Institute for men and AHITI for women can apply for the VA position of the L&DD. The total number of VAs in KPK is 1,560, of which 43 are female. In Abbottabad, Haripur and Mansehra, the numbers of VAs are 25, 33 and 35 respectively and only Abbottabad L&DD has one female VA. They are usually posted at Veterinary

Hospitals, Dispensaries or Centers and are engaged in veterinary treatment, AI and vaccination activities. Besides Vas, some graduates from ATI and AHITI engage in clinical work as private clinicians.

4-6 Actual situation and conditions of Livestock Farmer Field Schools

A total number of 64 (32 are female) facilitators have been trained by Kenyan and Pakistani experts under the support of SDC and a total of 37 LFFSs have been established, of which 18 were for women and 30 had been completed while the remaining 7 LFFSs were discontinued due to financial difficulties. In Abbottabad, Haripur and Mansehra, two, two and one LFFSs had been established respectively and only the two in Haripur were completed.

One LFFS usually consists of 20-30 members with one facilitator and regularly has a session at a certain time (e.g. one lactating period). The facilitator is supposed to play as medium to connect farmers with experts or VAs on certain subjects and the LFFS also needs a financially supporting institution for the members to demonstrate new techniques in the field.

An LFFS is a capacity building method based on non-formal adult education principles using groups of farmers. It is best described as "school without walls", where farmers learn through observation and experimentation in their own farms/fields. The approach empowers farmers using experimental and participatory techniques.

Chapter 5 Access to Finance

5-1 Asset holdings of small-scale farmers

KP Province has higher ratio of small-scale farmers (less than 3ha) than Punjab, Sind and Baluchistan provinces. According to the Agriculture Census 2010, the ratio of small-scale farmers in KP is 89%, Punjab is 79%, Sind is 70% and Baluchistan is 50%. That of Haripur District is 96%, Abbottabad District is 97% and Mansehra District is 93%, which is higher than the average of KP.

The ratio of assets holdings of agriculture machinery (tractor, tube well/pump, thresher, sheller, combined harvester and reaper harvester) of small-scale farmers in Abbottabad is less than 1% and Mansehra District is less than 2%. It means that small-scale farmers in the two districts hardly hold the assets of agriculture machinery. On the other hand, the ratio of the assets holdings of small-scale farmers in Haripur District is approximately from 3% to 5%, which is higher than the other two districts. Even so, the number is by far lower than that of big scale farmers (more than 150 acres) - more than 80% for tractor and thresher, and 25% for sheller. The usage of draught animals by small-scale farmers is around 14% in Abbottabad District and 15% in Mansehra District while 3% in Haripur. This illustrates that small-scale farmers in Abbottabad and Mansehra Districts are using draught animals more than tractors.

As a result of the interviews to the farmers in Haripur and Abbottabad Districts, small-scale farmers in the two districts are mainly livestock farmers who have few livestock such as buffers, cows, goats and hens. Some small-scale farmers who have agricultural land own a house and its grounds, fruits trees and cars.

5-2 Fundraising of small-scale farmers

The outreach of micro finance in KP Province is lower than Punjab and Sind provinces; however, the outreach of micro finance in Haripur, Abbottabad and Mansehra is higher than the other districts of KP Province. There are 12 offices of micro finance banks/institutions and three units: The total number of borrowers is 18,894 in Haripur. There are 15 offices and 15,500 borrowers in Abbottabad and 13 offices and 13,665 in Mansehra District.

The small farmers can access mainly three types of micro finance, i.e. micro finance banks/institutions, NGOs, and community organization groups. Firstly, the FINCA micro finance bank (FINCA) is one of the micro finance banks in the three districts. FINCA has around 700 borrowers and 74% of the borrowers are small-scale livestock farmers and 70 % of the borrowers are female. The bank provides loan services at amounts from around 50,000 PKR to 400,000 PKR at an interest rate from 24% to 30%. It requires one guarantee for the loan and does not require literacy. Secondly, Sungi Development Foundation (Sungi) is one of the NGOs which provides micro finance to females in the three districts. Sungi has had 40,000 borrowers and it has currently 7,000 borrowers: 70% of the borrowers are small-scale farmers. Sungi provides loan from 10,000 PKR to 150,000 PKR at 20% interest rate. Sungi does not require assets for the loans. Thirdly, some of the community organizations are likely to have micro finance within the group to support each other. It works as a method to improve farmers' livelihood. Thus, small-scale farmers have access to micro finance through micro finance banks and institutions, NGOs and community organizations with accessible conditions

in the three districts. Micro finance contributes to improvement of farmers' livelihood.

5-3 Farming income and additional income

Table 5-1 shows the ratio of monthly household income sources in rural areas in KP, Punjab, Sind and Baluchistan provinces. Wages and salaries are higher than other sources. On the one hand, the percentage of monthly household income from overseas/domestic remittances of KP is higher than in the other three provinces. The distribution of monthly household income sources in rural areas in KP is 30.15% for wages and salaries, 13.73% for other source apart from agriculture, 12.38% for foreign remittance, 10.57% for domestic remittance, 9.63% for livestock and 6.79% for crop production. It shows that the ratio of monthly household income from wages and salaries as well as overseas/domestic remittances are higher than livestock and crop production in KP.

According to the results of the interviews to small-scale farmers in Haripur, Abbottabad and Mansehra Districts, the income of small-scale farmers are diverse in the source such as livestock, agriculture, wages and salaries, domestic remittance and pension. The small-scale farmers have livestock and agriculture for selling purposes as well as household consumption, and fruit trees are for mainly household consumption.

Table 5-1. Percentage distribution of monthly household income by source of 4 provinces in Pakistan

Source Income	KP Province		Punjab Province		Sind Province		Baluchistan Province	
	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)
Wages and Salaries	45.15	30.15	39.00	25.11	63.62	43.01	52.07	44.68
Crop Production	1.01	6.97	3.57	20.56	0.94	25.07	1.55	21.60
Livestock	0.62	9.63	1.53	15.08	0.94	12.34	1.06	7.13
Other Non Agri Activities	22.51	13.73	28.75	12.87	14.59	6.17	24.19	12.40
Property (Owner Occupied Houses Excluded)	4.47	2.37	3.71	2.57	2.53	3.02	5.84	2.60
Owner Occupied Houses	11.47	6.11	11.28	6.24	13.22	6.66	10.86	7.54
Social Insurance Benefits Including Pension	3.37	2.10	3.03	2.15	1.55	0.63	3.10	0.30
Gifts & Assistance	1.76	4.95	1.2	3.68	1.19	2.34	0.83	1.87
Foreign Remittances	5.63	12.38	4.72	5.68	0.71	0.42	0.74	1.32
Domestic Remittances	3.72	10.57	2.79	5.74	0.70	0.15	0.03	0.62
Other Sources	0.28	1.04	0.43	0.32	0.00	0.19	-0.27	-0.06
Total	100	100	100	100	100	100	100	100

Source: Household Integrated Economic Survey (HIES), (2013-14)

Chapter 6 Access to Land and Social Structure

6-1 Access to land

In KPK the proportion of small-scale farmers (smaller than 5 acres) is over 80% in KPK and reaches to 97% in Abbottabad. Nevertheless, the proportion of landed farmers exceeds 96% in Abbottabad while that of tenant farmers is close to 10% in Mansehra, which is high in KPK. Sharecropping is more equitable in KPK than in different districts of Punjab. Landowners bear the cost of inputs equally. It appears that tenants' rights, as laid down in the tenancy acts, are not honored. For example, the act or law makes the landlord responsible for water rates and seed. The landlord also has to share on a 50-50 basis the cost of inputs such as fertilizer and pesticides. However, in practice, the cost of seed is the responsibility of tenants who also share irrigation costs.

6-2 Social structure

Pakistani rural society is based upon an unequal land tenure system. In KPK only a small percentage of all the farmers have over 25 acres of land and occupy 23% of all the agriculture land. On the other hand, the farmers with smaller than 5-acres of land account for 81% of all the farmers and own only 33% of all the agriculture land. In the rural areas such unequal land distribution is directly linked to the social strata having great landowners on top followed by landed farmers, and then, tenant farmers.

Asian Development Bank implemented a survey on rural society in Punjab and KPK and formulated a report in 2007, which concluded as follows: Various types of structures (including tribes, clans, and castes) exist and actively mediate social relations, hierarchies, and solidarities in rural Pakistan. While the dynamics within these structures vary from one region to another, and even from one village to the next, certain features are robust across locations and sociocultural settings. Kinship remains a crucial building block of social structures of various types, and kinship norms are strongly closely associated with patriarchy.

Chapter 7 Gender

7-1 Gender in Pakistan and KP Province

7-1-1 General Profile

The Government of Pakistan has made efforts to promote gender equality to some extent since it signed and ratified the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1996. However, a critical problem exists in that Islamic Laws and Custom Laws which are not necessarily compatible with State Laws are widely applied to the actual lives of people in Pakistan, and these tend to violate against women's rights³. Based on "Hudood Ordinances" and "Law of Evidence", many of the women victims of rapes are not able to testify that they are victims, and rather end up with being prisoned for "zina"⁴. Similarly, through the male-dominated community reconciliation system of "jirga", gender-based violence (GBV) cases tended to be solved in favor for men. Under Islamic Laws, women are entitled only to a half of what men are supposed to inherit, but, in reality, most of women give up even that right⁵. Thus, women in Pakistan do not necessarily enjoy equal rights, as men do, which are ensured under the Constitution and other State Laws.

In Pakistan, girls and women are widely considered to be commodities of men: 1) fathers' until they get married; and 2) husbands' after they get married⁶. Due to the good reason that men are supposed to protect girls and women from any risks, men tend to control girls' and women's freedom of mobility through the social custom of 'purdah' or segregation between men and women⁷. As a result, many girls and women are prevented from going to school and working outside home without the permission of their fathers, husbands, or other family members. This has largely contributed to very low levels of women's literacy, very low levels of female labor participation and lower incomes, very low levels of modern family planning prevalence, and high birth rate. The social custom of *purdah* has determined and perpetuated the gender division of space and gender division of labor/roles. Based on the gender division of labor/roles and unequal gender relations, many women in Pakistan need to rely on men for almost all aspects⁸.

7-1-2 Gender GAP Index

According to the World Economic Forum, Pakistan is ranked the 144th out of 145 countries in the world for Gender Gap Index (GGI) 2015 in which countries are evaluated on the gender gap in economic participation, educational level, health condition, and political participation. Even among countries in

³ Based on the review comments for the Government of Pakistan's 4th periodic report by the CEDAW Committee

⁴ http://daigakuin.soka.ac.jp/assets/files/pdf/major/kiyou/19_houritsu4.pdf (latest access on March 22, 2016)

⁵ <https://sdpi.org/publications/files/Microsoft%20Word%20-%20policy%20Brief%202023.pdf> (pp. 2. Latest access on March 24, 2016)

http://www.landesa.org/wp-content/uploads/2011/01/RDI_Report_WJF_Womens_Inheritance_Six_South_Asian_Countries_December_2009.pdf (pp. 59-61. Latest access on March 24, 2016)

⁶ http://www.af.org.pk/pub_files/1366345831.pdf (latest access on March 24, 2016)

⁷ *ibid.*

⁸ *ibid.*

South Asia, Pakistan is ranked the lowest in 2015. Since 2006, there have been few changes in the ranking of Pakistan for GGI, moving only from the second worst to the fourth worst.

7-1-3 Educational level for men and women

Due to the international initiatives of Education for All (EFA) and Millennium Development Goals (MDGs), the promotion of girls and women's education is taken into account by the Government, international organizations/bilateral donor agencies, and NGOs. As a result, there has been a drastic increase in women's literacy over the last three decades although it does not meet the MDG. Women's literacy rate increased from 19% in 1980's to 40% in 2000's and 47% in 2013-14⁹. The gender parity index (GPI) in literacy rate, enrollment rate for primary education, and enrollment rate for secondary education has been closed gradually, but still is far behind the MDG¹⁰.

In Pakistan, there is a huge gap in literacy rate and enrollment rate for primary education not only between sexes, but also between the four provinces and between rural and urban areas. The female literacy rate in Punjab Province is 53.3% in 2013-14, which is the highest rate among the four provinces and higher by 8.2 points and 24.6 points than KP Province and Balochistan Province, respectively¹¹. While there is 20.8 point-difference in the literacy rate between rural men and women in Punjab, there is 38.9 point-difference and 43.7 point-difference in KP and Balochistan, respectively¹². In the male enrollment rate for primary education in urban areas, there is not a much difference among four provinces, but female ones vary by Provinces as 65% in Punjab, 46% in KP, and 36 % in Balochistan¹³. More problematically, the rates in rural area are quite low as 37% in Punjab, 15% in Sindh, and 11% in Balochistan¹⁴.

In KP Province, Abbottabad, Haripur, and Mansehra Districts have marked relatively high literacy rate and primary education completion rate. According to Pakistan Social and Living Standard Measurement (PSLM) 2008-09, the total female literacy rate of KP Province is only 27% whereas ones of Abbottabad, Haripur, and Mansehra are 58%, 52%, and 41%, respectively. Looking at other Districts, a huge gap in literacy rate between those three districts and other districts and between men and women in other Districts is obvious as the rates of Kohistan, Hangu, Tank, Buner, Lakki, Marwat, Shangla, D.I.Khan are only 3% (male: 49%), 11% (71%), 12% (57%), 13% (63%), 15 % (69%), 15 % (63%), and 17% (46 %), respectively¹⁵. Similarly, the primary education completion rate of rural women in KP Province is only 21% whereas that in Abbottabad, Haripur, and Mansehra is quite high at 50%, 42%, and 31%,

⁹ Economic Survey 2011-12 and PSLM 2013-14.

¹⁰ PSB. 2015. *PSLM 2013-14*. Islamabad: PSB.

¹¹ PSB. 2015. *Pakistan Labour Force Survey 2013-14*. Islamabad: PSB.

¹² *ibid.*

¹³ PSB. 2015. *PSLM 2013-14*. Islamabad: PSB.

¹⁴ *ibid.*

¹⁵ PSB. 2015. *PSLM 2013-14*. Islamabad: PSB.

respectively¹⁶.

7-1-4 Labor participation of men and women

The labor participation rate of women in Pakistan is quite low in the world. According to Pakistan Labor Force Survey 2013-14, the labor participation rate of women in Pakistan is only 22.2% while that of men is 68.1%. The social custom of *purdah* may contribute to this low rate of women's labor participation. Although there is not a much difference in the labor participation rate of men between urban and rural areas, there is a huge gap in the rate between urban women (10.2%) and rural women (28.9%)¹⁷. This implies that women's labor participation concentrates in the agriculture sector in Pakistan. Approximately two thirds of working women belong to the agriculture sector whereas 34.2% of working men belong to the agriculture sector, 14.7% to the manufacturing sector, 9.5% to the construction sector, and 18.5% to the wholesale and retail sector¹⁸. Another problem faced by working women is that 55% of working women still work as helpers for family business, which implies that they are unpaid workers¹⁹.

7-2 Gender policy and gender mainstreaming in KP Province

7-2-1 Provincial machinery for gender equality and gender mainstreaming in KP Province

Based on the 18th Constitutional Amendment Act in 2011, the power and mandates entitled to the Ministry of Women at the national level was handed over to the provincial governments. In KP Province, the Social Welfare, Special Education and Women Empowerment Department has functioned, in cooperation with Provincial Commission of the Status of Women (PCSW), as the provincial machinery for gender equality and gender mainstreaming²⁰. The Department, however, is institutionally and structurally weak as it has only two gender specialists and one gender analyst who take responsibilities for policy and legislative arrangement for gender equality and women's empowerment in KP Province²¹.

7-2-2 Gender Policy in KP Province

The Government of KP Province has developed "KP Women Empowerment Policy Framework", based on which the government has aimed to promote the empowerment of women in all aspects. The Framework is consisted of 4 parts: 1) social empowerment; 2) economic empowerment; 3) political empowerment; and 4) legal empowerment (access to justice).

7-2-3 Integration of Gender into Development and Agriculture Policies of KP Province

The Government of KP Province has developed "Integrated Development Strategy (IDS) 2014-2013,

¹⁶ *ibid.*

¹⁷ PSB. 2015. *Pakistan Labour Force Survey 2013-04*. Islamabad: PSB.

¹⁸ *ibid.*

¹⁹ *ibid.*

²⁰ Based on the website of the Department and PCSW's leaflet "An Introduction to Provincial Commission on the Status of Women KP".

²¹ Based on the interview with Secretary of the Department on Feb. 24, 2016.

based on “Comprehensive Development Strategy (CDS), “Economic Growth Strategy (EGS), and “Post-conflict Needs Assessment (PCNA)”. IDS aims at poverty reduction through economic growth, focusing on the development of energy, agriculture, mining and manufacturing, and tourism sectors. as a strategy for growth. While a gender perspective is not integrated evenly in the Strategy, the separate section of “Gender Equity” is included.

The Government has also developed “Agriculture Policy KP A Ten Year Perspective (2013-23)”, supported by FAO. In the Policy, the section of “Addressing food security and needs of the vulnerable groups” touches some key points pertaining to gender-mainstreaming into the agriculture sector. Those points include that in spite of women’s playing an important role in agriculture and animal husbandry, women do not have access to extension services and that in order to disseminate information and skills for women, it is important to invite women for Farmers’ Field School at the community level.

7-3 Women in agriculture in KP Province

7-3-1 General profile of rural KP Province

Due to its geographic location bordered with Afghanistan, KP Province has socially and economically been affected by the flow of numerous refugees from Afghanistan after the invasion of Soviet Union into Afghanistan in 1979 and that of the NATO and US Military into Afghanistan after the 9.11 terrorist attacks²². With the influence of the refugees and unstable/unsafe social conditions, the traditional social orders of KP Province was gradually destroyed and investment for KP Province was discouraged²³. As a result, a lot of people in KP Province left for other Provinces and foreign countries, seeking for job opportunities²⁴.

KP Provinces has been hit and affected by the 2005 Kashmir Earthquake and the 2011 flooding. The financial losses of the Province due to the earthquake and flooding were Rs. 58.7 billion and US\$1.17 billion, respectively²⁵. Due to the flooding, 72,000 cows/buffaloes and 67,000 sheep/goats as well as 6 billion chicks were killed, accounting for 50% of the total livelihoods in KP Province²⁶.

In KP Province, approximately 83% of its total population live in rural areas²⁷. According to the data in 2005-06, the poverty ratio per capita of KP Province is 28.2% whereas that of Pakistan is 22.3%²⁸. The poverty ratio of rural KP is 29.2% and 6.5 points higher than that of urban KP²⁹. According to Household Integrated Economic Survey (HIES) 2013-14, critical determinants for people living under the poverty

²² UNDP. 2011. *KP Millennium Development Goals Report 2011*. Islamabad: UNDP.(pp. 1)

²³ *ibid.*

²⁴ *ibid.*

²⁵ *ibid.*

²⁶ *ibid.*

²⁷ PSB. 2010. *PSLM. 2008-09*. Islamabad: PSB.

²⁸ UNDP. 2011. *KP Millennium Development Goals Report 2011*. Islamabad: UNDP.

²⁹ *ibid.*

line in Pakistan include average household size, dependency ratio, etc. The average household sizes for the richest 20% in urban and rural areas in 2013-14 are 6.09 persons and 6.49 persons, respectively³⁰. However, those for the poorest 20% in urban and rural areas are 8.63 persons and 8.08 persons, respectively, which are 2.54 persons and 1.59 persons more than their counterparts³¹. The average household size of KP Province is 7.2 persons, which is 0.67 person more than the average household size of Pakistan³². On the other hand, the average number of earners at the household level is 2.04 persons in rural KP, which is not very different from the figure of 2.35 persons in rural Pakistan³³. The dependency ratio of rural areas is 104.77 while that of urban areas is 83.46³⁴. In order to decrease the poverty ratio in Pakistan and KP Province, it may be essential to decrease the average household size and population growth rate.

The average household monthly income of KP Province is Rs. 30,515, which is lower than Punjab's Rs. 33,962, but more than Sindh's Rs. 25,112 and Balochistan's Rs. 28,321³⁵. There is a wide gap in the average household monthly income between urban (Rs. 42,882) and rural (Rs. 27,715) KP Province³⁶. The distribution of the monthly income in rural KP Province comprises 30% wages/salaries, 6.97% of agriculture, 9.63% of livestock, 12.38% of foreign remittance, and 10.57% of domestic remittance³⁷. Looking at the distribution by the quantile, the poorest 20% rely their more on wages/salaries (42.27%), agriculture (9.14%), and livestock (11.43%) rather than foreign remittance (5.54%) and domestic remittance (9.17%)³⁸.

In KP Province, people living under the poverty line are less among those working in the agriculture sector (26.95%) than those working in the service sector (31.72%) and those working in the mining/manufacturing sector (44.98%)³⁹. The poverty ratio is much higher among those who possess land and housing than among those who do not possess land or housing⁴⁰. In KP Province, the poverty ratio among those who possess land is only 19.51% while that among those who do not possess land is 32.35%⁴¹.

³⁰ PSB. 2015. *HIES 2013-14*. Islamabad: PSB.

³¹ *ibid.*

³² *ibid.*

³³ *ibid.*

³⁴ *ibid.*

³⁵ *ibid.*

³⁶ *ibid.*

³⁷ *ibid.*

³⁸ *ibid.*

³⁹ Social Development in Pakistan 2004 <http://www.spdc.org.pk/Data/Publication/PDF/AR-6.pdf> (pp.59 latest access on March 24, 2016)

⁴⁰ *ibid.*

⁴¹ *ibid.*

In Pakistan, 61% of female-headed households live in rural areas⁴². In 2000-01, 54% of the total households were female-headed in KP and the figure was 41% in Punjab while in 2004-05 it was 50% in Punjab and 49% in KP⁴³. In Pakistan, the poverty ratio is not necessarily higher among female-headed households than among male-headed households. However, the scores of poverty gap and poverty severity at the household level are much higher among female-headed households in rural areas (5.41 for poverty gap and 1.65 for poverty severity) than among male-headed households in any areas⁴⁴. According to Khalid and Akhtar, the statistically efficient variables to determine whether or not those women-headed households live under the poverty line include age, literacy, engagement in wage-labor/entrepreneurship, having remittance, dependency ratio, and living in rural area⁴⁵.

7-3-2 General Profile of agriculture in KP Province

KP Province can be divided ecologically into three areas: 1) the southern area; 2) the central area; and 3) the northern area⁴⁶. In the southern area, food crops are produced while in the mountainous northern area, high-value products such as mushrooms and vegetables are produced⁴⁷. On the other hand, in the central area, which has rich land and water resources as well as the market for agricultural inputs and sales, sugar canes, tobacco, and vegetables are produced and farmers' incomes are relatively higher⁴⁸. In KP Province, around 42 kinds of crops are produced, including wheat, rice, maize, sugar cane, tobacco, ground nuts, beans, vegetables, fruits, etc⁴⁹.

According to the Agriculture Census in 2010, farming households can be categorized into three types: 1) those farming their own land (58%); 2) those that borrow and farm others' land in addition to their own land (27 %); and 3) tenants (15%)⁵⁰. Landless population can be categorized into three types: 1) people engaged in carpentering, blacksmith, pottery, weaving, etc. based on their occupational caste; 2) those engaged in agriculture on a contract basis; and 3) agriculture laborers (not contract basis)⁵¹.

7-3-3 Men's and women's role in agriculture and livestock management in KP Province

Women in rural areas of KP Province take responsibility for not only reproductive work, such as household chores and child care, but also productive work, such as agriculture and livestock

⁴² <http://pide.org.pk/pdf/Working%20Paper/WorkingPaper-80.pdf> (latest access on March 24, 2016) (pp.7)

⁴³ *ibid.*

⁴⁴ *ibid.*

⁴⁵ Khalid & Akhtar. 2011. "Poverty Dynamics of Female-headed Households in Pakistan: Evidence from PIHS 2000-01 and PSLM 2004-05, PIDE Working Papers 2011-80". (pp. 10)

⁴⁶ FAO. 2015. *Women in Agriculture in Pakistan*. Islamabad: FAO.

⁴⁷ *ibid.*

⁴⁸ *ibid.*

⁴⁹ *ibid.*

⁵⁰ <http://www.professor-frithjof-kuhnen.de/publications/rual-development-pakistan/2-a.htm> (latest access on March 24, 2016)

⁵¹ *ibid.*

management⁵². They spend 12 to 15 hours per day for such reproductive and productive work, especially caring for livestock⁵³. Despite their hard work, women's work is generally unpaid. Commercial-based agriculture is exclusively dominated by men, and the incomes earned through the sales of dairy products and animals are usually controlled by men⁵⁴. Furthermore, few women are involved in decision-making processes on how to manage agriculture and animal husbandry at the household level⁵⁵.

What kind of work women do for cropping and livestock management and how much they are involved in cropping and livestock management may depend on social norms for women (the level of *purdah*), distance of agricultural fields from main roads, landholding size, household size, etc. In the traditional tribal communities where *purdah* is practiced, women may be refrained even from going to the fields and working there. If the field faces a main road, women may not be allowed to work in the field by their family members for fear of exposing themselves to other men. If a woman's family holds a large piece of land and does commercial-based farming, some laborers are hired and women may not need to work in the fields. On the other hand, if male family members do not stay at home and work abroad or in other places, women may have to take double role in cropping and livestock management for the absent men.

In general, men take the main role in water management with irrigation, machine operation, and chemical fertilizers and pesticide practice. Women are engaged in other work, such as seed preparation, weeding, cultivation, post-cultivation treatment, etc. According to the results of the survey conducted by FAO in 2015, women in the northern area feel that they are involved in most of the agricultural work, except plowing, practicing chemical fertilizer, and water management⁵⁶. On the other hand, women in the central and southern areas do not feel that they are involved in agriculture, except for seed preparation, drying products, and storing products⁵⁷. In the central area, in particular, where *purdah* is practiced, women might not be allowed to work in the fields, but are limited to the work available at home, such as seed preparation and post-cultivation treatment⁵⁸.

In KP Province, animal husbandry is one of the most critical income sources as demand for dairy products has increased in urban areas. Each household in rural KP keeps two to 10 animals, including cows, buffaloes, sheep, and goat as well as chicks⁵⁹. In general, women take responsibility for collecting fodder/grass for animals, feeding and watering, collecting manure, cleaning, milking, etc. According to the survey done by FAO in 2015, women in the northern, central, and southern areas feel that they are

⁵² FAO. 2015. *Women in Agriculture in Pakistan*. Islamabad: FAO.

⁵³ *ibid.*

⁵⁴ *ibid.*

⁵⁵ *ibid.*

⁵⁶ *ibid.*

⁵⁷ *ibid.*

⁵⁸ *ibid.*

⁵⁹ *ibid.*

involved in all work necessary for livestock management, except selling animals⁶⁰. While in the northern area, 70% of women feel that they take a role in selling animals, in the central and southern areas, only 25% and 35%, respectively, feel so⁶¹.

7-3-4 Access to/control over resources and power over decision-making

Based on the power relationship between sexes embedded in society, gendered division of labor/role tends to be determined, based on which, what resources men and women are able to have access to may also be determined. In accordance with the power relationship and gendered division of labor/roles, who makes a decision can be also determined. In traditional and patriarchal society, due to unequal gender relations, agricultural land is possessed only by men, and therefore, men are recognized as farmers, but not women. Due to the practice of *purdah*, women are not allowed to go to the market. In other words, only men can have access to the market, which implies that men have access to agricultural inputs, such as seeds, chemical fertilizer, and pesticide and access to and control over the income earned from agricultural products, dairy products, and animals. Thus, how to manage farming and animal husbandry tends to be decided only by men, and women end up providing their labor without participating in decision-making processes.

Based on their division of labor/roles, men have more access to agricultural machines, irrigation, and agricultural inputs. Due to their land ownership, men can have access to loan and credit services from commercial banks while women have access only to micro-credit/finance services if they have any at all. In animal husbandry, large size animals such as cows and buffaloes are usually controlled by men. Men are considered to make the decisions on buying and selling those animals. Women are also involved in buying sheep, goat, and hens through available micro-credit/finance. However, they might need to get permission from their male family members and may not be allowed to make decisions on their own. The access to the market limited to men might contribute to the systematic exclusion of women from control over the income earned in the market and decision-making on cropping and animal husbandry.

The traditional gendered division of labor/roles and unequal gender relations embedded deeply in the society might not be able to be transformed without any effective interventions by external organizations. Based on the author's interview with women farmers in Haripur District, KP Province on Feb. 27 and March 1, 2016, there are a couple of good practices in which women farmers have been involved as main actors in agriculture or animal husbandry. They are successful in not only the enhancement of their livelihoods, but also in their empowerment and the transformation of gender division of roles and gender relations. One is a story of a woman farmer aged 47 who had been abandoned by her husband. Without any financial support by her husband, she is raising her three children while other two daughters have already been married off by her. After losing the household breadwinner, she and her children suffered financially and she made her mind up to earn her livelihood from animal husbandry. With the money

⁶⁰ *ibid.*

⁶¹ *ibid.*

borrowed through a community micro-finance program, she started her business with only one cow. She has scaled up her business up to raising two cows, six buffaloes, four goats, etc. at present. Since she does not have any agricultural land, she has to buy all fodder/grass and feed which costs her Rs. 56,000 to 66,000 per month while she earns around Rs. 90,000 by selling milk. In her case, she did not have any financial and technical support from NGOs, but technical support only from a senior veterinary officer belonging to the District Department of Livestock. She is educated up to the 10th grade and relatively free from the social norms of *purdah*, which seems to have largely contributed to her success.

Another case is about a woman farmer aged 32 whose husband is away from their home due to his military work. She used to be a very shy woman, always stayed at home, and followed whatever her parents-in-law and husband ordered/suggested her to do before she was involved in activities of a local NGO called PHKN. The local NGO of PHKN first approached the community leaders and religious leaders in her community and explained to them about women's rights, the importance of the recognition of women's role and capacity, and needs for women's involvement in livelihood activities and decision-making. After convincing those leaders about the involvement of women in activities, the NGO's community mobilizers approached women to raise women's motivation. In order to raise awareness of women's rights and transform the wrong ideas of gender, the NGO conducted gender-sensitization workshops, involving both men and women at the community level. With better understanding and support by men, women in this community started actively participating in the training and other activities conducted by the NGO. This woman farmer has succeeded in cropping, animal husbandry, and horticulture based on the knowledge and skills which she gained through the training programs. Based on her knowledge and skills, her parents-in-law and husband changed their attitude toward her and came to rely on her to manage agriculture and animal husbandry. Nowadays, she is a main decision-maker on agriculture and animal husbandry at the household level.

Thus, women's active participation and empowerment cannot be achieved only with the provision of skill training and resources. To achieve the objectives, men's understanding and support are rather essential to promote the motivation and confidence of women who used to be always protected by men and were prevented from doing anything on their own will. Therefore, it is very important for the government and external organizations to first mobilize community people and sensitize both men and women on gender when they start livelihood-enhancement projects. This can be a first step to transform traditional gendered division of labor/roles and unequal gender relations, which may lead to not only women's empowerment, but also have a great impact on household livelihoods and income.

7-3-5 Constraints of women in participation and possible measures

The most critical constraint preventing women from participating in agriculture and animal husbandry activities/projects might be the practice of *purdah* and women's limited mobility. Because women's literacy rate and educational level in prospective target districts of Abbottabad, Haripur, and Mansehra are relatively higher than other districts, people in those districts can be less conservative and they can be easily convinced to let women become involved in activities and support their participation. If there were

no intervention by external organizations before, people may not be aware of women's rights, their role as farmers, and the importance of their involvement in activities. Therefore, such a case might require the processes of community mobilization and gender sensitization from the initial stage of projects.

From the perspective of a provider, there exists a critical problem that both Agriculture Department and Livestock Department at the provincial and district levels lack human resources of women experts, such as agriculture officers, field assistants, veterinary officers, and veterinary assistants. Because of *purdah*, women farmers might not be able to take any training instructed by men, but women. It is not appropriate to exclude women farmers only because women instructors are not available from the provincial government. Instead, it is better to consider the possibility of conducting training for women with available human resources outside the government until female experts are hired by the government. It is also effective to utilize external organizations, such as local NGOs, with their know-how and experiences of community mobilization and gender sensitization which are essential for the promotion of small-scale agriculture and animal husbandry.

Chapter 8 Other Matters

8-1 Activities and projects in agriculture, animal husbandry, and farming village development by other donors

The main donors which have worked or have been working in the sectors of agriculture, animal husbandry and rural development in KP Province are FAO, European Union (EU), SDC and Netherlands. FAO has been working for the control of livestock infectious diseases such as foot and mouth disease (FMD) and peste des petits ruminants (PPR) in KP: The projects are still ongoing. EU prioritizes KP Province and has worked to strengthen livestock services in KP. SDC prioritizes KP and FATA, and worked for the capacity building of L&DDD. It has been operating the project of Livelihoods Programme Hindukush in 5 districts of KP Province and 2 districts of FATA. The government of Netherlands established the AHITI and trained female livestock assistants in KP Province in 1986 though it is no longer present in the province. The Agency for International Development (USAID) and Department of International Development (DFID) funded NGOs in the sectors of animal husbandry and rural development in KP.

8-2 Activities and projects in agriculture, animal husbandry, and farming village development by NGOs

Numerous NGOs worked for the recovery in the sector of agriculture, animal husbandry and rural development in Hazara Division after the earthquake in Kashmir in 2005. However, after the incident of Osama bin Laden in Abbottabad District in 2011, the regulation of international NGOs by the Pakistani government was enforced. As a result of this regulation, the number of international NGOs in KP Province has been decreased. Nevertheless, local NGOs are present in Hazara Division, creating many community organizations in the sectors of agriculture, animal husbandry and rural development for the betterment of livelihood of local people. Sungi Development Foundation, which is a local NGO, has been working in Haripur, Abbottabad and Mansehra Districts for more than 25 years, and worked for the Hazara Integrated Rural Development for 13 years implementing 22 livestock projects. Pakistani Hoslamand Khawateen Network (PHKN) is also a local NGO which creates CBOs for community development and empowerment of females through agriculture, livestock and vocational training in Haripur District. Sarhad Rural Support Programme (SRSP) has been working to create CBOs in Hazara Division in the sectors of agriculture, animal husbandry and rural development in Hazara Division.

Chapter 9 Action Plan

9-1 Challenges in the surveyed districts

9-1-1 Agriculture sector

The challenges for the agriculture sector in KP are as follows.

- Challenges for the agriculture policy and the structure of Agriculture Department
 - The new agriculture policy was formulated in 2013, but it has not been reflected to the policy measures of the Agriculture Department. It is not clear if the Department will be given enough budget to implement the strategies of the policy.
 - The new agriculture policy aims to promote the commercialization and the formulation of strategy of agriculture base on value chain analysis, but the Department lacks the skills and experiences to implement them.
 - The numbers of Agriculture Officers and Field Officers are very small compared to the numbers of farmers resided in KP, so the extent of their extension works are quite limited.
 - The main target of the extension activities of the Agriculture Department is the farmers with more than 1 acre of land, and the supports to the marginal farmers which is predominant in KP are limited.

- Challenges for agricultural production
 - Marginal and small-scale farmers are predominant.
 - The productivities of major crops such as wheat and maize are lower than other areas of Pakistan. The low utilization of high yield seeds and irrigation and the small-scale of the farms seem to be the main reasons for it.
 - There are a number of farmers who cultivate highly value-added crops such as sugarcane, tobacco, and vegetables, but it is difficult for those farmers who do not have access to irrigation to grow these products.
 - Many of the areas in KP are suitable to grow fruits trees, but the production of fruits does not lead to the income generation of farmers in many cases due to lack of skills and knowledge on post-harvest management, processing, and marketing.

9-1-2 Livestock sector

The challenges for the livestock sector in KPK are as follows.

(1) L&DD

- Capacity building of the management staff
- Capacity building of the technical staff
- Establishment of the new directorate for extension
- Employment of female staff
- Improvement of veterinary health services (treatment, disease diagnosis)

- Breed improvement of cattle (including AI service)

(2) Livestock farmers

- Improvement of animal productivity
 - i) Improvement of feed
 - ii) Countermeasures for internal parasites
 - iii) Increase of conception rate
- Countermeasures for animal diseases
- Improvement of farm management
- Enhancement of marketing skill
- Securement of water (depends of locations)
- Initial investment for small business such as goat raising and poultry farming

9-2 Development strategies

9-2-1 Agriculture sector

Based on the analysis in this report, the development strategies for the agriculture sector can be proposed as follows.

1. Improvement of productivities of major commodities of KP such as wheat and maize by the increase of irrigation facilities, high yield seeds, fertilizer, and pesticide.
2. Increase of added value of fruits production at farmers' level by improving their skills on post-harvest management, processing, and marketing.
3. Introduction of high valued-added crops such as vegetables and herbs
4. Introduction of kitchen gardens
5. Introduction of processing of milk and horticulture products at household or village level

It is important to note that the establishment of development model for marginal and small-scale farmers, who are predominant in rural KP, would generate a significant social impact in KP. In view of this, Strategies 1 and 2 above do not have much impact to the marginal and small-scale farmers. The feasibility of Strategy 3 depends on the climate and the access to water, the region specific strategies that consider the environment and the value chain of each crop should be formulated. Strategies 4 and 5 can be implemented relatively easily.

9-2-2 Livestock sector

The following strategies can be applied for livestock development in KPK.

- i) Improvement of productivity of cattle and buffaloes, and enhancement of countermeasures for animal diseases (targeting farmers)
- ii) Capacity building of technical staff and improvement of diagnostic service (targeting L&DD)

The concept of the strategies is illustrated in Figure 9-1.

Discussion on JICA's Assistance for Livestock and Dairy Development Department, Khyber Pakhtunkhwa, Pakistan





[Site Location] Abbottabad, Haripur and Mansehra Districts, Hazara Division				OUTPUT 1 (Demonstration)	OUTPUT 2 (Extension)	OUTPUT 3 (Diagnostic Service)
[Beneficiaries] Small-scale farmers in the 3 districts				The appropriate techniques on livestock are demonstrated in the target areas.	The extension services regarding the appropriate techniques are established.	The diagnostic services for animal infectious diseases are strengthened.
CHALLENGES		PLAYERS				
Livestock and Dairy Development Department	<ol style="list-style-type: none"> Capacity building of the staff (especially technical staff) Full establishment of Directorate of Production, Extension & Communication (including development of extension materials) Employment of female staff (Veterinary Officer, Veterinary Assistant, Extension Officer, Community Mobilizer) Improvement of veterinary health service Improvement of AI service 	Veterinary Officers (VOs)		[Trainings] (VO & VA) Fodder Production, Parasite Control, Agricultural Business,	[Trainings] (VO & VA) Mobilization, Gender, Facilitation, etc.	[Trainings] (VO & VA) Sample Collection & Preservation, Diagnostic Techniques,
		Veterinary Assistants (VAs)		Breeding, Data Collection, Monitoring & Analysis, Marketing etc.		etc. 
		Extension Officers (EOs)		[Trainings] (EO & CM) Agricultural Business, Data Collection, Monitoring & Analysis	[Trainings] (EO & CM) Mobilization, Gender, Facilitation, etc.	
		Community Mobilizers (CMs)		Marketing etc.		
Small-scale farmers	<ol style="list-style-type: none"> Improvement of livestock productivity <ol style="list-style-type: none"> Improvement of fodder Control of stomach worms Increase of conception rate (heat detection, AI skills) Countermeasures to animal diseases Water management (depending on the location) Initial investment for small livestock business (case by case) Agricultural Business Marketing 	Small-scale Farmers		[Field Demonstration] with VAs & CMs	[Trainings] LFFS	
						

Figure 9-1. Concept chart on development strategies in the livestock sector

9-3 Proposed summary of livestock project (draft)

Name of the Project: Improvement of Livestock Service in Hazara Division of KPK

Project Period: 3-5 years

Target Areas: Abbottabad, Haripur and Mansehra Districts

Implementation Institutes: Provincial L&DD, District L&DDs in Abbottabad, Haripur and Mansehra

Beneficiaries: Small-scale farmers in the target areas

Project Purpose: The services provided by the L&DDs are improved.

Output 1. The appropriate technologies on livestock are demonstrated.

Activity

- 1-1 To implement training (feed, parasitic diseases, breeding, farm management, data collection, monitoring, data analysis, etc.) for technical staff in the target areas (VOs, VAs, social mobilizers, etc.)
- 1-2 To select model farms
- 1-3 To formulate activity plans together with farmers and technical staff based on the needs of the model farms

- 1-4 To implement monitoring and data collection of activities by technical staff
- 1-5 To summarize appropriate techniques based on the analysis results by technical staff
- 1-6 To revise the techniques every year
- 1-7 To reflect the demonstrated techniques to livestock policy

Output 2. Extension services on the demonstrated techniques are established.

Activity

- 2-1 To implement training (mobilization, facilitation, gender, etc.) for technical staff in the target areas (VOs, VAs, social mobilizers, etc.)
- 2-2 To organize farmers utilizing the existing farmers' groups (FFS, CBO, etc.)
- 2-3 To implement LFFSs
- 2-4 To share the results (lesson learned, good practices, etc.) of LFFSs (holding workshops)
- 2-5 To reflect the extension services to livestock policy

Output 3. The diagnostic services for infectious diseases are strengthened.

Activity

- 3-1 To illustrate the actual conditions of disease occurrences and diagnostic system in the target areas
- 3-2 To establish the diagnostic system at the veterinary hospitals
- 3-3 To train technical staff on diagnoses of infectious diseases
- 3-4 To prepare training materials for technical staff
- 3-5 To make brochures for farmers
- 3-6 To reflect the control measures of infectious diseases to livestock policy

Part II

Report on the Survey in Punjab Province

Chapter 1 Agriculture Policy

1-1 Related agriculture policies, position, and priority challenges

1-1-1 Agriculture sector

Agriculture policy does not exist in Punjab Province. There is, however, the Punjab Agriculture Sector Plan, which was formulated by the Department of Agriculture in 2015.

The Punjab Agriculture Sector Plan states the following four fields as major functions of the agriculture sector.

- Increase the supply and quality of agriculture crops and products for local consumption and for export
- Improve living standards of small and subsistence farmers through increase income generation from agriculture
- Contribute towards national food security
- Promote integrated and sustainable use and management of natural resources

Under the Agriculture Sector Plan, the key goals to be achieved by 2020 are as follows.

- Raise the growth rate of agriculture sector to 5%
- Improve service delivery to farmers with 75% farmer access
- Improve the productivities of following crops
 - Wheat: 20%
 - Sugarcane: 20%
 - Cotton: 25%
 - Rice: 15%
 - Maize: 10%
- Transform the Department of Agriculture into a strong ICT-led farmer-centric institution

Mobilize private investment of Rs.75bil into the agriculture sector

1-1-2 Livestock sector

The livestock development policy of Punjab Province is amplified in "The Policy Papers" formulated by the Provincial Livestock and Dairy Development Department (L&DD) in June 2015. The Papers summarize the major challenges in the following fields; 1) Public Policy, 2) Governance, 3) Knowledge, 4) Marketing, 5) Finance, and 6) Production, upon which the aims and objectives of provincial livestock policy would be formulated as follows:

(1) The development framework

Sustainable development of the livestock and dairy sectors is the basic mandate of the L&DD through optimal utilization of resources and enabling the stakeholders to take productive decisions in the very domains of livestock and dairy.

(2) The marketing growth

The heart of the proposed policy is that the private sector should be in the driving seat and government should work as a facilitator & stabilizer of business environment.

(3) The governance framework (paradigm shift from curative to preventive)

The L&DD is required to work as a facilitator "Livestock Asset Manager of the Province" and not merely the administrator, implementing the following measures; 1) Human Resource Development, 2) Disease Prevention (through disease surveillance and forecasting, vaccination, improvement of animal husbandry practices, and deworming), 3) Improvement of Food and Nutrition, 4) Enhancement of Extension Services, and 5) Capacity Building of Livestock Production Systems.

(4) Partnerships for socio-economic change-livestock activists

Livestock is not only an economic activity, rather a way of life. Woman is the one who spends maximum time with the livestock. The government has decided to encourage the participation of rural women, Imam Masajid and students as catalysts of socio-economic development of the farmers - the primary producers of livestock.

(5) The regulatory framework

The government has decided to create a Provincial Drug Control and Marketing Facilitation Authority to regulate the production, marketing, sale and administration of medicines and products pertaining to the livestock sector.

(6) The service delivery framework

It encompasses the service delivery architecture pertaining to ensuring food security, competitiveness of the sector and prosperity of stakeholders and generating exportable surpluses.

Apart from The Policy Papers, " the Punjab Livestock Breeding Act 2014" was introduced and the Livestock Breeding Service Authority was established. in 2014. The Authority shall; 1) regulate provision of breeding services in accordance with the provisions of the Act; 2) raise awareness regarding standards and quality of breeding services; and 3) conserve and develop local genetic resources. In terms of the standards and procedures of breeding, details of the following subjects are stipulated in "The Standard Operating Procedure for Performance Recording and Progeny Testing"; 1) selection of breeding animals, 2) collection and production facilities, 3) use of semen, ova and embryos, 4) AI technicians, and 5) contents of certificates.

1-2 Organizational structure of the provincial government

1-2-1 Agriculture sector

(1) Department of Agriculture, Punjab

Figure 1-1 depicts the structure of Department of Agriculture, Punjab.

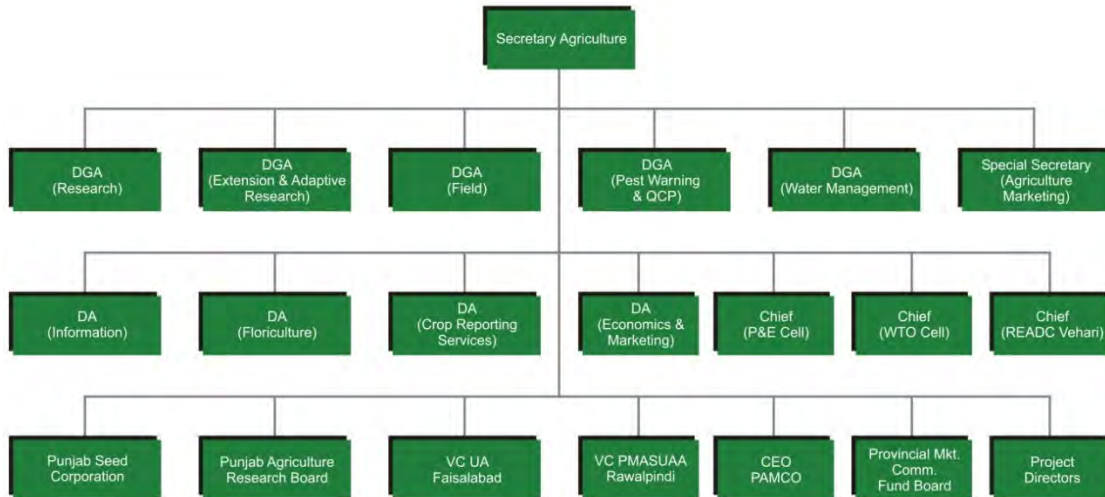


Figure1-1. Structure of Department of Agriculture, Punjab.
 Source: Homepage of Department of Agriculture, Punjab

(i) Directorate General Agriculture (On Farm Water Management: OFWM)

(a) Structure

Figure 1-2 depicts the structure of OFWM.

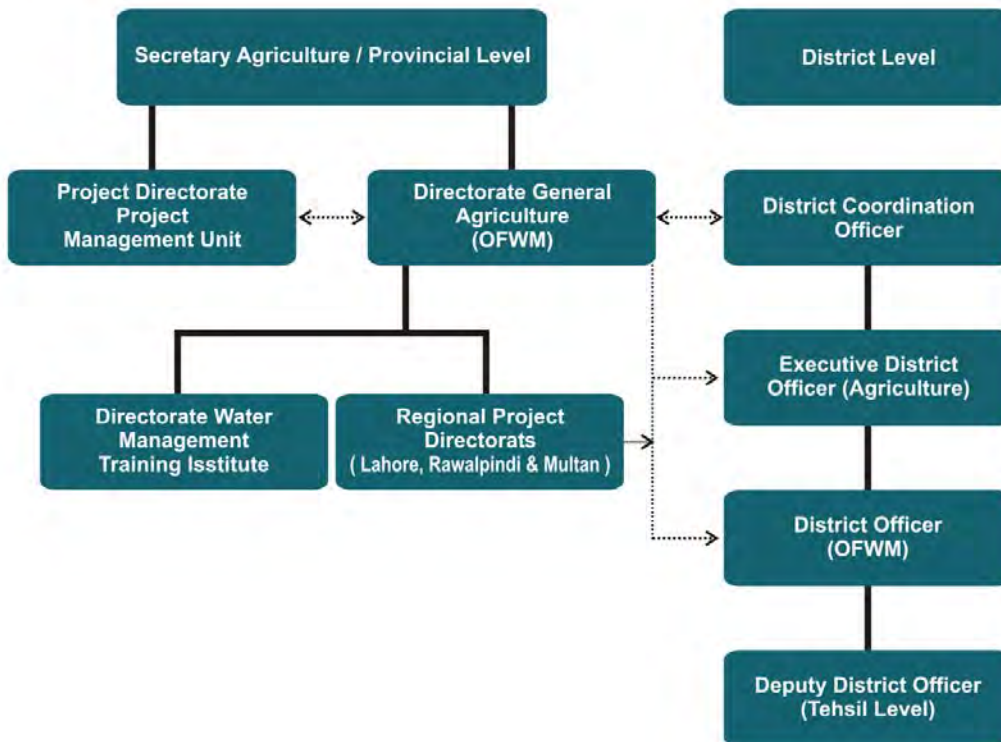


Figure1-2. Structure of Directorate General Agriculture (On Farm Water Management: OFWM)
 Source: Homepage of Department of Agriculture, Punjab

(b) Functions

The major functions of Directorate General Agriculture (on Farm Water Management: OFWM) are as follows.

- Formulation of Water Users' Associations
- Improvement and rehabilitation of watercourse
- Scheduling of water usages
- Promotion of land leveling
- Promotion of rationalized irrigation systems such as drip irrigation and sprinkler

Among the irrigation facilities shown in Figure1-3, OFWM is responsible for managing watercourses only. The Irrigation Department is responsible for managing other facilities.

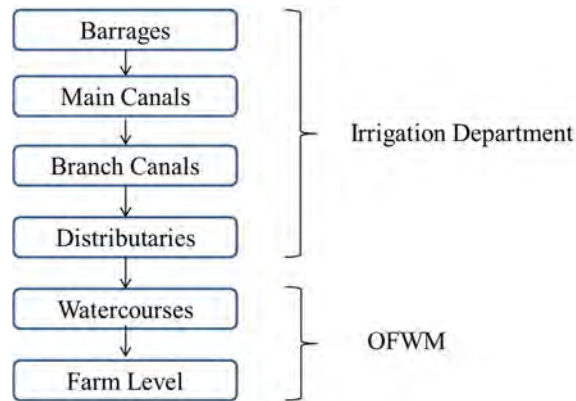


Figure 1-3. Types of irrigation facilities and managing institutions

Source: JICA research team

(ii) Directorate General Agriculture (EXT & AR)

(a) Structure

Figure 1-4 depicts the structure of Directorate General Agriculture (EXT & AR).

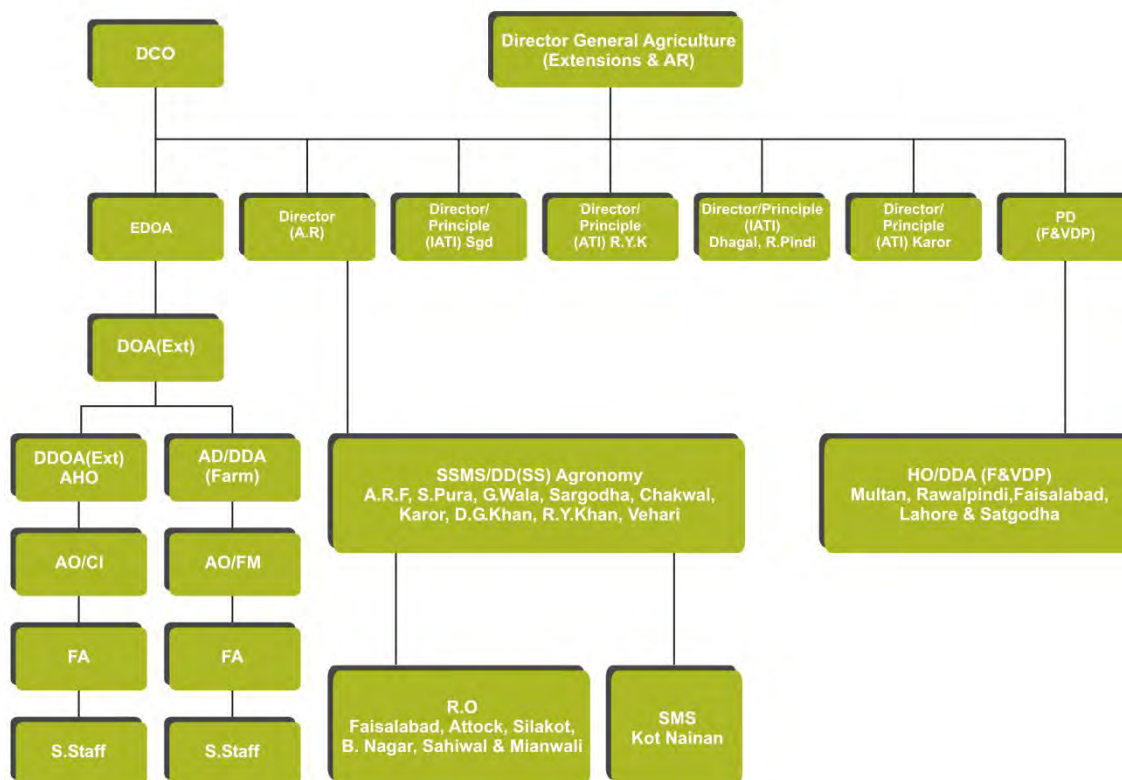


Figure 1-4. Structure of Directorate General Agriculture (EXT & AR)

Source: Homepage of Department of Agriculture, Punjab

(b) Functions

The major functions of the Directorate General Agriculture (EXT & AR) are as follows.

Provincial level

- Preparation and printing of production technology / planning of crops
- Fixing of area and production targets
- Preparation of provincial level development projects
- Interaction with other provincial and federal governments
- Amendments in agriculture laws and provincial level implementation
- Monitoring of the district level activities

District level

- Implementation of production technology achievement of area and production targets
- Maintenance of agriculture statistics
- Implementation of production technologies
- Conduct village level farmer trainings
- Implementation of approved projects
- Preparation of district level projects
- Implementation of agriculture laws

- Monitoring of agriculture inputs availability
- Participation in provincial review meetings

(c) Major projects

The major current projects are as follows.

- Promotion of pulses cultivation
- Enhancing vegetable production
- Managing of fruit fly through non-conventional method
- Promotion of agriculture mechanization
- Distribution of rust free wheat seed to famers
- Promotion of agri extension activities through smartphone
- Extension Service 2.0
- Wheat seed distribution project

(iii) Directorate General Agriculture (Research)

(a) Structure

Ayub Agricultural Research Institute Faisalabda, which was established in 1961, is functioning as research section of the department. Figure 1-5 depicts the structure of Directorate General Agriculture (Research).

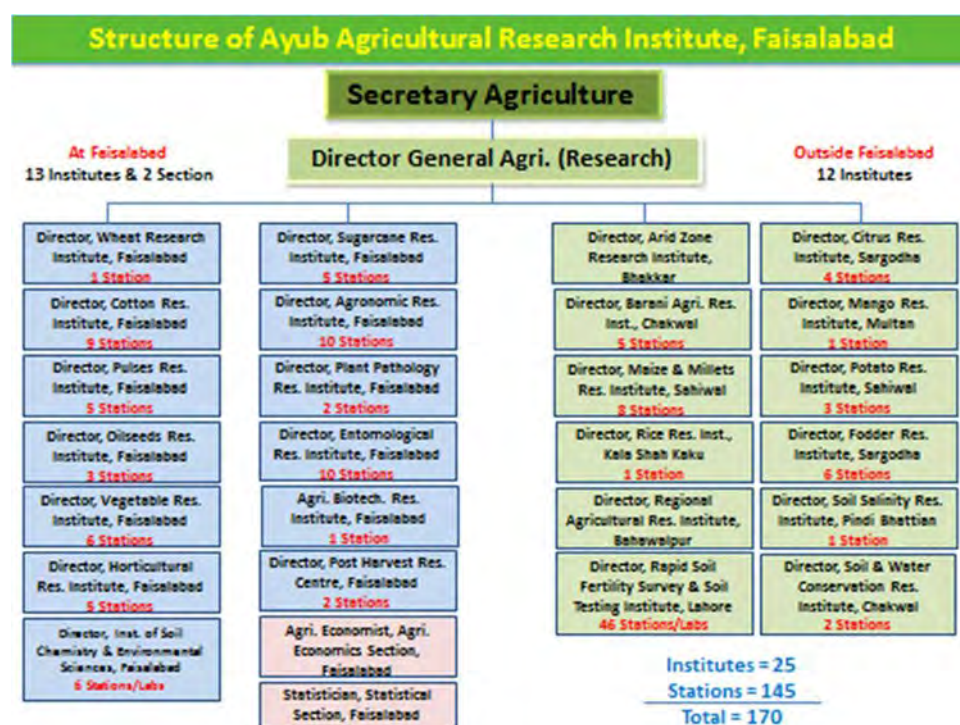


Figure 1-5. Structure of Directorate General Agriculture (Research)

Source: Homepage of Department of Agriculture, Punjab

(a) Functions

The major functions of Directorate General Agriculture (Research) are as follows.

- Development of new varieties
- Technological development of food security, value addition, and sustainable development

(b) Major projects

The major current projects of the Directorate are as follows.

- Construction of laboratories and farm support at Cotton Research Institute Faisalabad and its stations.
- Cotton production sustainability through addressing issues of biotic and abiotic stresses
- Development of rice varieties and water saving technologies for water stressed areas in Punjab.
- Standardization of post-harvest technology for the production and processing of premium quality indigenous dates palm fruit.
- Use of treated sewage water for vegetable, fodder, and wheat production and quality improvement.
- Development of integrated management of citrus orchards to enhance the yield and improvement of fruit quality.
- Improvement in seed production technology of vegetable crops.
- Production of pre-basic/basic virus free seed of the approved potato variety/ varieties through tissue culture.
- Strengthening of research facilities at Fodder Research Sub-station, AARI, Faisalabad for the development of silage type corn varieties.
- Strengthening of Food Technology Section & PHRC, Ayub Agricultural Research Institute, Faisalabad.
- Development of genetic engineering facilities at Agri. Biotechnology Res. Institute, AARI, Faisalabad.
- Establishment of Soil and Water Testing Lab. At Chiniot and Nankana Sahib.
- Development of castor bean varieties and Sunflower hybrids to enhance the oilseeds production.
- Additional facilities for improvement in fruit yield and quality of guava dates and pomegranate.
- Evolution of Sorghum and corn genotypes for the production of conserved fodders.
- Up-gradation of Main Library, Ayub Agricultural Research Institute, Faisalabad through IT Interventions.
- Provision of Lab. and field equipment for development of Basmati rice hybrids resistant to bacterial leaf blight, flood and salinity in Punjab.
- Introduction and adaptation of high value crops and fruits in climatic conditions of Punjab
- Developing Potohar into an olive valley.
- Provision of additional research facilities for development of heat resilient maize hybrids at maize & millets research institute.

There are two research institutes, the Mango Research Institute and the Horticulture Research Station, in the survey areas. Both institutes are under the Directorate of General Agriculture (Research)

(iv) Mango Research Institute, Multan

Figure 1-6 depicts the structure of the Mango Research Institute.



Figure 1-6. Structure of the Mango Research Institute
Source: Handbook of the Mango Research Institute

The major functions of the five sections of the Mango Research Institute are described in Table 1-1.

Table 1-1. Function of each section of the Mango Research Institute

Section	Function
Horticulture Section	Develop new varieties Evaluate main commercial varieties against biotic and a-biotic stresses
Plant Nutrition Section	Studies for sustainable production of quality mango Standardize Plant Nutrition
Plant Pathology Section	Conduct studies on different mango diseases
Entomology Section	Conduct studies for mango insects
Post-Harvest Section	Standardize the postharvest practices to the international level

Source: Interviews with the staffs of Mango Research Institute

(iii) Horticulture Research Station, Bahawalpur

(a) Basic description

The Horticulture Research Station, Bahawalpur was established in 1985. The number of staff of the

center is depicted in Table 1-2.

Table 1-2. Number of staff in Horticulture Research Station, Bahawalpur

Title	Number of staffs
Horticulturist	1
Assistant Horticulturist	1
Research Officer	2
Supporting staff	14

Source: JICA Survey Team, based on the interview with the staffs of Horticulture Research Station

The kinds of horticulture products cultivated and the scale of cultivation in the research fields of the station are as follows.

- Dates: 35 acres
- Guava: 3 acres
- Mango: 2 acres
- Phalsa: 1 acre
- Jujeba (Ber): 4 acres

(b) Major project

Under the project of Additional Facilities for Improvement in Fruit Yield and Quality of Guava Dates and Pomegranate, 72 imported date trees are planted in the research fields of the Horticulture Research Station. Table 1-3 depicts the characteristics of the kinds of dates imported by the project.

Table 1-3. The characteristics of dates planted in the center by the Project of Additional Facilities for Improvement in Fruit Yield and Quality of Guava Dates and Pomegranate

Variety	Origin	Color	Size	Productivity per tree	Retail price in Pakistan (Rs./Kg)	Retail price in the country of origin (Rs./Kg)	Weight of kernel
Ajwa	Saudi Arabia	Black	Round and small	60Kg	2,400	Not known	1g
Amber	Saudi Arabia	Brown	2 Inches	120Kg	2,000	1,000	2g
Khalas	Saudi Arabia	Yellow	Not known	100Kg	1,500	Not known	
Burhea	Iraq	Yellow	3.0 Inches	200kg	Not known	1,000	
Mabroom	Saudi Arabia	Brown	3.5 Inches	100Kg	2,000	1,500	
Khudri	Saudi Arabia	Black	3.5 Inches	100Kg	1,000		
Soghi	Saudi Arabia	Brown	Not known	Not known	Not known	Not known	
Shishi	Saudi Arabia	Brown	Middle size	Not known	Not known	Not known	
Nabut Ali seif	Egypt	Brown	Not known	Not known	Not known	Not known	

Source: JICA Survey team, based on the interviews with the staffs of Horticulture Research Station, Bahawalpur

Also, this institution is growing the following kinds of dates of foreign origin by importing the suckers.

Table 1-4 lists the other dates trees imported by the institution.

Table 1-4. Other dates trees planted in Horticulture Research Station, Bahawalpur

Name of varieties	Country of Origin
Rotana	Saudi Arabia
Ajwa	Saudi Arabia
Shiliki	Saudi Arabia
Vaber	Saudi Arabia
Shnra	Iraq

Source: Source: JICA Survey team, based on the interviews with the staffs of Horticulture Research

1-2-2 Livestock sector

The Provincial L&DD is in charge of the administration of the livestock sector in Punjab and divided into two wings, Extension and Research (as seen in Figure 1-7). The former provides services mainly on animal health and breeding, and each district government also has L&DD under the four Directorates of the Provincial L&DD. On the other hand, the latter has Veterinary Research Institute (VRI) and Foot & Mouth Disease Research Center in Lahore locating Poultry Research Institute and Livestock Production Research Institute in the regions.

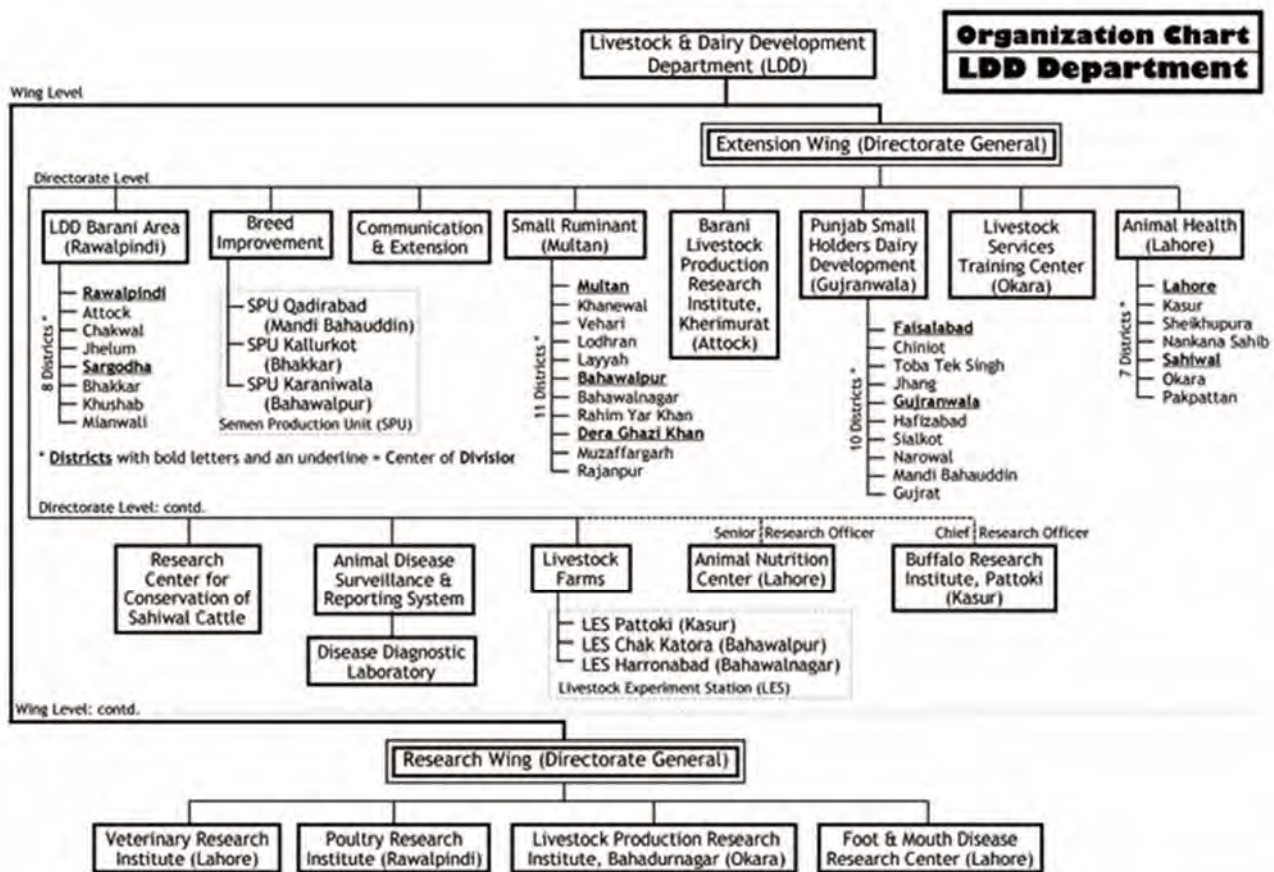


Figure 1-7. Organizational Structure of the Provincial L&DD

The Extension Wing consists of 13 directorates as seen in Figure 1-2 and their missions are as follows: 1. treatment and control of animal diseases (mainly by the district L&DDs), 2. disease surveillance and reporting, 3. development of livestock and poultry genetic resources (including production of frozen semen), 4. conservation of local breeds (including progeny testing), 5. capacity building of the various stakeholders, 6. research on animal nutrition including feed and fodder, and 7. communication and extension.

In the districts, L&DD is providing the services such as veterinary treatment, artificial insemination (AI) and vaccination by veterinary officers (VOs), Veterinary assistants (VAs) and AI technicians (AITs) posted at veterinary hospitals, dispensaries and centers including mobile dispensaries. In addition, the veterinary hospital located in the headquarters has a diagnostic laboratory providing basic diagnostic services to farmers.

In Punjab, the vaccinations for major animal diseases such as FMD, hemorrhagic septicemia, enterotoxemia and black quarter, and deworming for stomach worms became free on all the livestock in 2015, though parts have been left unattended. The related services will become available for all mainly by means of mobile dispensaries, which have been increasing in number accordingly. Besides, the district L&DDs also provide extension services such as "Farmers' Day", "High School Focus Program" and "Performance Management System".

The major mission of the Research Wing is research activities on livestock development, however, it also includes vaccine production, development and quality control, disease investigation, training of the staff and

farmers, and internship for students and researchers. The production of vaccines for major diseases does not meet the demand. For example, in case of the vaccines against hemorrhagic septicemia, 30 million doses were produced in 2014-2015 while 42 million cattle and buffaloes were estimated in 2013-2014. Similarly, for enterotoxemia, 25 million doses were produced in 2014-2015, which are fewer than the estimated total number of sheep and goats (31.6 million). The Provincial L&DD announced carpet vaccinations for these two fatal diseases in 2015 and accordingly the production is expected to exceed the total numbers of the target animals. On the other hand, 58 million doses of vaccine against Newcastle disease were produced in 2014-2015, which certainly satisfied the estimated number of poultry in Punjab (41 million).

Chapter 2 Natural and Social Conditions

2-1 Nature

Punjab's geography mostly consists of the alluvial plain of the Indus River and its four major tributaries in Pakistan, the Jhelum, Chenab, Ravi, and Sutlej rivers. There are several mountainous regions, including the Sulaiman Mountains in the southwest part of the province, and Margalla Hills, Salt Range, and Pothohar Plateau in the north. In the south of Punjab, the Cholistan Desert sprawls over Bahawalpur, Bahawalnagar, Rahim Yar Khan Districts and spread to India. The desert covers two thirds of Bahawalpur (16,000 km²) and the total area reaches 26,300 km² with an average annual rainfall of 12 mm. The backbone of Cholistan economy is cattle breeding. It has major importance for satisfying the area's major needs for cottage industry as well as milk meat and fat.

According to the 1998 census, Punjab covers an area of 205,344 km² and the total population was approximately 73.6 million out of whom 51.7% are males and 48.3% females. The density of population is 445 per km² and the annual increase of population is of about 2.64%.

Climatically, Punjab has three major seasons: 1) hot weather (April to June) when temperature rises as high as 50 °C (122 °F), 2) rainy season (July to September) (average rainfall annual ranges between 960 mm in the sub-mountain region and 46 mm in the plains),and. 3) cooler/ foggy / mild weather (October to March). Temperature goes down as low as -2°C (28 °F).

2-2 Social infrastructures

Punjab has established 38,000 primary schools, which is nearly twice as many as in Japan (22,000) while only 75 schools were constructed finally in 2015 in Cholistan Desert. The estimated population of Punjab in 2014 is 100 million and that of Japan is 120 million. The numbers of middle and high schools are almost same as those in Japan. The ratio of enrolled girl students is also around 50% (43–52%) for primary, middle and high schools, which implies that the environment for girls to receive higher education is established to some extent in Punjab.

Availability of hospitals is only around 10 in the surveyed four districts, which is overwhelmingly few (nearly 200 per prefecture in Japan). The numbers of beds per 1,000 of population are also very low especially in Khanewal and Muzaffargarh, 0.39, 0.14, 0.71 and 0.11 in Multan, Khanewal, Bahawalpur and Muzaffargarh respectively while 8-9 in the advanced countries, Japan, the UK and the USA.

2-3 Economic infrastructures

(1) Electricity

Table 2-1 shows the time trend of the number of villages electrified by province. One can see that the number of villages electrified in Punjab Province has been gradually increased.

Table 2-1. Number of Villages/Settlements Electrified by Province

	Pakistan	Punjab	Sindh	Balochistan	K.P.K.	FATA
2003	81,022	43,900	16,377	4,186	13,238	3,321
2004	90,489	48,796	17,832	5,105	15,396	3,360
2005	103,253	57,280	18,914	5,873	17,662	3,524
2006	117,456	66,977	20,595	6,689	19,671	3,524
2007	127,897	73,510	22,006	7,694	21,163	3,524
2008	137,765	78,543	23,880	9,328	22,229	3,785
2009	152,827	86,097	27,095	11,183	24,449	4,003
2010	164,532	92,112	29,085	12,519	26,281	4,535
2011	174,800	97,423	31,549	14,253	27,002	4,573
2012	185,648	103,798	34,349	15,330	27,577	4,574

Source: “Statistical Pocket Book Punjab 2014”, Punjab Bureau of Statistics

(2) Gas

Table 2-2 shows the time trend of gas consumption in Punjab Province. The quantity of gas consumption has been decreasing in the industrial sector in since 2009, but it has been increasing in the domestic sector since 2003

Table 2-2. Gas Consumption by Consumer Group in Punjab (Thousand Decca Meters)

Year	Total	Domestic	Commercial	Industrial	Others
2003	1,200,148	246,742	42,539	908,489	2,378
2004	1,427,550	277,593	48,875	1,098,383	2,699
2005	1,506,825	272,147	52,653	1,179,609	2,416
2006	1,505,163	305,514	56,996	1,141,575	1,078
2007	1,560,922	337,472	59,388	1,164,719	2,343
2008	1,522,576	351,796	64,676	1,103,353	2,751
2009	1,521,674	355,072	68,577	1,096,653	1,372
2010	1,311,087	366,023	66,773	876,539	1,792
2011	1,266,593	409,032	74,582	781,588	1,391
2012	1,146,120	440,569	78,320	625,877	1,327

Source: “Statistical Pocket Book Punjab 2014”, Punjab Bureau of Statistics

(3) Transportation

Table 2-3 shows the total length of roads in Punjab Province and the survey areas. One can see that the length of national highway is quite long in Multan, but the lengths of districts roads are relatively longer in the other three districts.

Table 2-3. Length of road (July 2014, Km)

	Total road length	National highway	Motor way	District roads		
				Highway	Farm to market road	Other
Punjab	75,920	1,610	387	10,821	39,030	0
Multan	1,976	140	0	138	873	0
Khanewal	2,203	77	0	181	1,395	0
Bahawalpur	2,678	96	0	444	1,210	0
Muzaffargarh	3,132	42	0	891	1,297	0

Source: “Punjab Development Statistics 2015”, Punjab Bureau of Statistics

2-4 Geographical location

The survey areas, Multan, Khanewal, Bahawalpur, Muzaffargarh, are located in the southern part of Punjab. The major cites of these districts are on N-5 highway, which connects Lahore and Karachi.



Figure 2-1. Road map of Punjab

Source: “Road Distance Map-Punjab Province”, World Food Programme

Table 2-4 shows the road distances of major cities in Pakistan and the major cities of the survey areas.

Table 2-4. Road distances of major cities (Km)

	Karachi	Lahore	Faisalabad	Multan	Khanewal	Bahawalpur	Muzaffargarh
Karachi		1,272	1,188	933	937	885	831
Lahore			186	348	298	390	436
Faisalabad				248	205	279	351
Multan					56	40	97
Khanewal						89	148
Bahawalpur							125
Muzaffargarh							

Source: Google Map

2-5 Employment opportunities inside and outside villages

Many young people in rural areas work as unskilled workers for construction. As infrastructure projects are quite rare, house construction is the major work for them. The daily wage of the unskilled labor for construction is usually Rs.400 per day. During harvesting period of major crops such as wheat and maize, there is high demand for agricultural laborers. The wage for unskilled agricultural male laborers is also Rs.400 per day. The wage for female labor is about Rs.200 per day.

A number of young people work as unskilled labors in major cities in Pakistan such as Islamabad, Lahore, and Karachi or even in the foreign countries. However, as depicted in Table 2-5, the remittances of these people who work outside is not so significant compared to other areas of Pakistan.

Table 2-5. The ratio of remittance to the total household income (2013-14)

	Rural Pakistan	Punjab Pakistan
Domestic remittance	9.5	9.2
International remittance	4.95	4.5

Source: Household Integrated Economic Survey 2013-14

Chapter 3 Agriculture

3-1 Environment

(1) Distribution of rivers and deserts

Figure 3-1 depicts the distributions of rivers and deserts in Pakistan. Several rivers such as Indus River, Sutlej River, Ravi River, and Chenab River flow in the survey areas. In the western part of Bahawalpur District, Cholistan Desert is extended, and Thall Desert is extended to a part of the Muzaffargarh District.

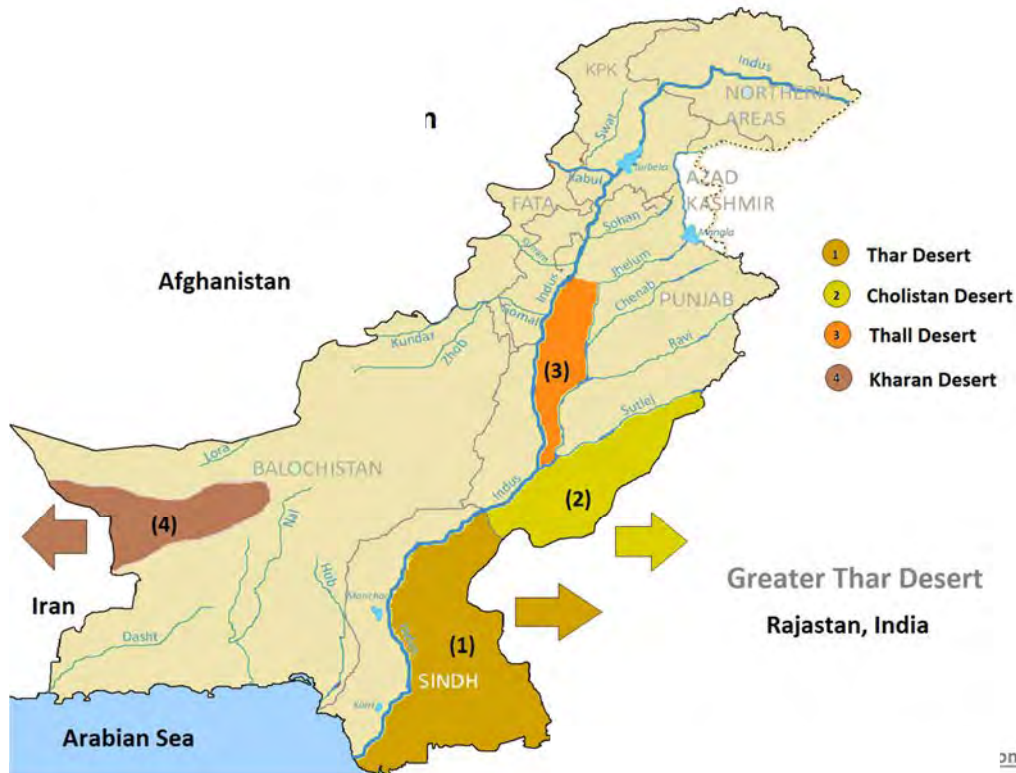


Figure 3-1: Distribution map of rivers and deserts in Pakistan

Source: "Deserts in Pakistan, Pakistangeographic.com
pakistangeographic.com/deserts.html

(2) Agro-ecological zones

The survey areas are divided into the following two agro-ecological zones

- Sandy Desert: Cholistan and Thall deserts
- Northern Irrigated Plain: Other areas

3-2 Areas of farm and cultivated land

Table 3-1 shows the ratio of cultivated and uncultivated lands to total lands in Punjab and survey areas. The ratios of cultivated areas are relatively high in Multan and Kharnewal, as there are extended areas of irrigated lands. The ratios of cultivated lands in Bahawalpur and Muzaffargarh are relatively small.

Table 3-1. Ratio of cultivated and uncultivated areas in Punjab and survey areas (2010-2011)

	Cultivated Area			Uncultivated area			
	Total	Net sown	Current fallow	Total	Culturable waste	Forest	Not available for cultivation
Punjab	71%	62%	9%	29%	9%	3%	17%
Multan	81%	68%	13%	19%	7%	0%	12%
Khanewal	86%	85%	1%	14%	6%	1%	7%
Bahawalpur	71%	65%	5%	29%	10%	1%	19%
Muzaffargarh	53%	44%	9%	47%	27%	4%	15%

Source: "Land Utilization 2010-2011", Punjab Bureau of Statistics

3-3 Scale of farms

Table 3-2 shows the average size of farm in Punjab and the survey areas. The size of farm in Khanewal is almost same as the average of Punjab Province. However, those in other districts are smaller than the average size of Punjab Province.

Table 3-2. Average size of farm (hectare), 2010

Area of farm(Ha)	Pakistan	Punjab	Multan	Khanewal	Bahawalpur	Muzaffargarh
Total	2.59	2.27	2.02	2.27	2.14	1.78

Source: Agriculture Statistics 2010

3-4 Major agricultural products

(1) Commodities and fodder

Table 3-3 shows the areas of production, quantities of production, and productivity of major commodities and fodder. The cultivation of rice and maize is quite small in the four districts of survey areas, and wheat is the major commodity in the areas. As many of the farmers in the survey areas keep livestock, fodder is also extensively cultivated.

Table 3-3. Areas of production, quantities of production, and productivity of major commodities and fodder
(thousand hectares, thousand tons, tons/hectare) 2011-2012

		Pakistan	Punjab	Multan	Khanewal	Muzaffargarh	Bahawalpur
Wheat	Aera	8,649.8	6,482.9	167.1	195.5	299.1	262.2
	Production	23,473.3	17,738.9	434.5	574.0	823.2	836.8
	Productivity	2.7	2.7	2.6	2.9	2.8	3.2
Rice	Aera	2,571.3	1,714.2	10.5	21.9	23.1	4.1
	Production	6,160.4	3,277.0	17.0	37.4	41.0	6.5
	Productivity	2.4	1.9	1.6	1.7	1.8	1.6
Maize	Aera	1,087.1	603.9	6.2	12.7	3.2	2.4
	Production	4,338.0	3,441.7	17.2	80.0	4.9	6.0
	Productivity	4.0	5.7	2.8	6.3	1.5	2.5
Fodder	Aera	2,109.3	1,812.4	58.4	70.5	58.8	41.0
	Production	46,405.6	39,160.2	1,427.0	1,697.3	1,176.5	934.1
	Productivity	22.0	21.6	24.4	24.1	20.0	22.8

Source: "District-wise production data", Punjab Bureau of Statistics

(2) Cash crops

The major cash crops in the survey areas are sugarcane and cotton. Table 3-4 shows the areas of production, quantities of production, and productivity of sugarcane and cotton. The production of sugarcane is relatively large in Bahawalpur and Muzaffargarh. The production of cotton is relatively large in Khanewal and Bahawalpur.

Table 3-4. Areas of production, quantity of production, and productivity of sugarcane and cotton (thousand hectares, thousand tons, tons/hectare) 2011-2012

		Pakistan	Punjab	Multan	Khanewal	Bahawalpur	Muzaffargarh
Sugarcane	Area of production	1,057.3	761.2	4.1	8.1	17.8	40.1
	Quantity of production	58,397.0	42,893.0	205.3	421.0	1,106.9	2,372.3
	Productivity	55.2	56.3	50.7	52.0	62.2	59.2
Cotton	Area of production	2,533.7	2,533.7	179.7	208.4	283.7	171.2
	Quantity of production	11,129.0	11,129.0	870.4	1,052.9	1,363.5	660.9
	Productivity	4.4	4.4	4.8	5.1	4.8	3.9

Source: "District-wise production data", Punjab Bureau of Statistics

(3) Vegetable

Table 3-5 depicts areas of production and quantity of production of major vegetables. There are several vegetables where the four districts of the survey areas produce a significant ratio of the total production of Punjab; one can see the various vegetables are extensively cultivated in the survey areas.

Table 3-5. Areas of production, quantities of production, and productivity of major vegetables (hectares, tons)
2011-2012

		Punjab	Multan	Khanewal	Bahawalpur	Muzaffargarh	Total quantities of 4 districts/Punjab
Potato	Area of production	173,683	1,048	5,139	321	117	
	Quantity of production	3,235,322	16,349	80,430	4,271	1,630	3%
Chili	Area of production	5,510	728	303	308	203	
	Quantity of production	8,456	1,297	399	503	335	30%
Tomato	Area of production	6,539	101	255	306	992	
	Quantity of production	85,981	1,549	2,798	3,832	13,717	25%
Matter	Area of production	11,708	385	121	12	344	
	Quantity of production	74,814	3,120	929	96	2,665	9%
Carrot	Area of production	8,610	283	395	99	202	
	Quantity of production	161,317	5,617	7,861	1,911	3,266	12%
Turnip	Area of production	10,100	133	364	46	28	
	Quantity of production	197,078	2,981	6,718	867	523	6%
Culliflower	Area of production	7,931	279	229	83	178	
	Quantity of production	159,915	6,825	5,947	1,607	3,120	11%
Ladyfinger	Area of production	5,311	291	261	77	203	
	Quantity of production	58,827	3,252	3,009	688	1,773	15%
Bitter gourd	Area of production	4,043	53	287	192	40	
	Quantity of production	43,591	563	2,730	1,968	470	13%
Tinda	Area of production	6,711	28	935	129	121	
	Quantity of production	66,973	314	9,053	1,128	1,232	18%
Others	Area of production	74,954	2,885	3,592	2,577	1,962	
	Quantity of production	1,122,159	43,249	49,446	38,246	27,416	14%

Source: "District-wise production data, Punjab Bureau of Statistics

(4) Fruits

Table 3-6 shows the areas of production and quantity of production of major fruits. One can see the quantity of production of mangos in survey areas, especially Multan district, is quite significant.

Table 3-6. Areas of production, quantities of production, and productivity of major vegetables (hectares, tons) 2011-2012

		Punjab	Multan	Khanewal	Bahawalpur	Muzaffargarh
Total Fruits	Area of production	388,096.1	40,387	24,315	14,688	24,744
	Quantity of production	4,235,472.0	532,195	293,812	167,538	289,580
Citrus	Area of production	183,568.1	5,871	6,936	6,872	1,015
	Quantity of production	2,076,831.0	55,467	92,409	56,675	8,540
Mango	Area of production	111,431.0	31,363	13,354	4,350	19,020
	Quantity of production	1,304,223.0	433,898	166,281	49,352	228,053
Banana	Area of production	731.0	34	178	0	48
	Quantity of production	4,500.0	185	1,208	0	255
Guave	Area of production	52,866.0	966	2,840	243	48
	Quantity of production	377,555.0	7,481	22,010	1,972	364
Pomegranate	Area of production	1,747.0	554	79	44	607
	Quantity of production	11,859.0	3,733	509	279	4,367
Dates	Area of production	5,807.0	117	13	324	3,278
	Quantity of production	44,170.0	801	64	3,000	25,698

Source: District-wise production data, Punjab Bureau of Statistics

3-5 Cropping calendar

Figure 3-2 depicts the cropping calendars of major crops in the survey areas. The major crop in the Rabi period in the survey areas is wheat. Right after the harvesting and threshing activities of wheat, many farmers start sowing cotton and sugarcane, two major Kharif crops in the survey areas. Also, right after harvesting of cotton and sugarcane in October to December, most farmers have to start sowing wheat. These periods (April to June and October to December) are the busy times for most of the farmers.

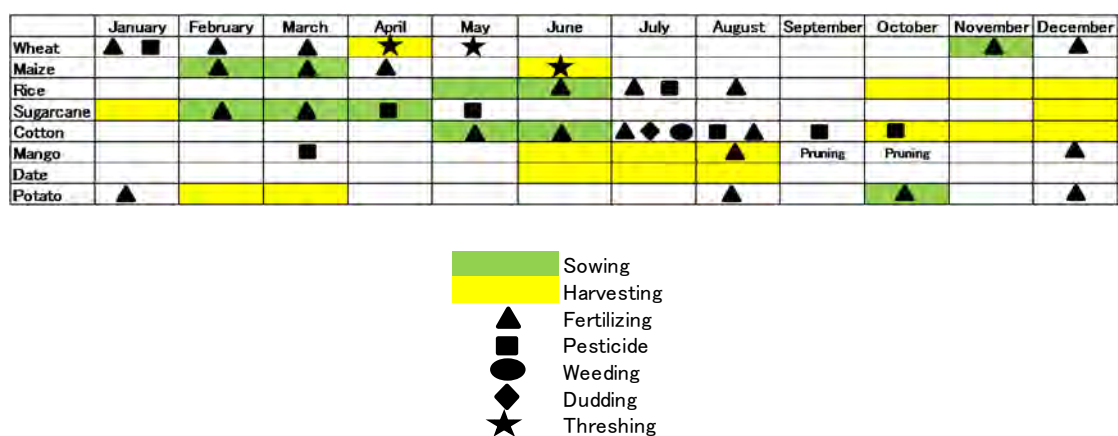


Figure 3-2. Cropping calendar of major crops in the survey areas

Source: JICA Survey team

3-6 Agricultural inputs

(1) Water

Table 3-7 shows the status of irrigation in Punjab and the survey areas. Farms with 100% irrigation account for 77.5% in Punjab. It is more than 97% for the four districts of the survey area, indicating the survey areas are well equipped with irrigation facilities.

Table 3-7. Farms reporting irrigated area as %age of cultivated area (number of farms and ratio)

	Under 51%		51%-76%		76%-100%		100%		Unirrigated farms	
	Number of farms	Ratio	Number of farms	Ratio	Number of farms	Ratio	Number of farms	Ratio	Number of farms	Ratio
Pakistan	146,139	1.9%	53,327	0.7%	34,712	0.4%	6,113,403	77.5%	1,537,398	19.5%
Punjab	91,688	1.8%	25,345	0.5%	20,475	0.4%	4,164,912	81.7%	792,831	15.6%
Multan	188	0.2%	359	0.3%	1,074	1.0%	102,328	97.6%	852	0.8%
Khanewal	520	0.4%	64	0.0%	337	0.3%	129,864	99.2%	156	0.1%
Bahawalpur	834	0.5%	576	0.3%	484	0.3%	169,038	98.8%	85	0.0%
Muzaffargarh	722	0.3%	113	0.0%	485	0.2%	282,440	99.4%	381	0.1%

Source: Agriculture Census 2010

(2) Fertilizer and pesticide

Table 3-8 shows the %ages of farmers who use fertilizer and pesticide in Punjab and survey areas. The ratio of usages of fertilizer and pesticide is relatively high in the four districts of the survey areas.

Table 3-8. The ratio of farmers who use fertilizer and pesticide (%), 2010

	Chemical fertilizer and manure	Chemical fertilizer only	Manure only	Pesticide	Weedicide
Pakistan	30	41	3	33	30
Punjab	30	45	2	41	40
Multan	41	46*		66	62
Khanewal	32	45*		47	47
Bahawalpur	36	46*		56	47
Muzaffarga	22	64*		50	48

Source: Agriculture Census 2010

(3) Agriculture machinery

Table 3-9 shows the %ages of ownership of agriculture machinery in Punjab and survey areas. The ownership of tractors in Bahawalpur is smaller than the average of Punjab, but it is higher in the other three districts. The ownership of spray machines in the survey areas is higher than the average of Punjab Province.

Table 3-9. %ages of ownership of agriculture machinery, 2010

	Tractor	Thresher	Sheller	Combined harvester	Reaper/Harvester	Spray machine
Pakistan	9%	4%	1%	0%	1%	17%
Punjab	11%	5%	0.5%	0.4%	1.1%	21%
Multan	12%	5%	0.5%	0.4%	2.0%	31%
Khanewal	11%	6%	0.4%	0.1%	1.0%	32%
Bahawalpur	8%	5%	0.2%	0.7%	1.4%	26%
Muzaffargarh	13%	5%	0.2%	0.2%	1.7%	35%

Source: Agriculture Census 2010

3-7 Salinity

Table 3-10 shows the areas of salinity and the ratio of saline areas to total land in Punjab and the survey areas, based on the survey by the Department of Agriculture in 2003. In Multan, Khanewal, and Muzaffargarh, the %age of saline areas to total area is higher than the average of Punjab.

Table 3-10. The area and the ratio of saline land, 2003

	Area (ha)			Ratio	
	Area investigated	Area of weak salinity	Area of moderate and strong salinity	Area of weak salinity	Area of moderate and strong salinity
Punjab	8,993.2	869	290.3	9.7%	3.2%
Multan	361.0	43	16.6	12.0%	4.6%
Khanewal	377.5	45	16.2	11.9%	4.3%
Bahawalpur	468.5	19	5.0	4.1%	1.1%
Muzaffargarh	474.8	73	19.6	15.4%	4.1%

Source: "Punjab Development Statistics 2004", Punjab Bureau of Statistics

3-8 Agricultural processing

(1) Basic description

As Multan and Khanewal are the major mango production areas, there is an agglomeration of factories which process mangos and other fruits in these districts.

(2) Major processing facilities

The following is the list of major processing facilities in the survey areas.

Multan District

- Large-scale pulp factories

Agro Food Processing (AFP)

- Small-scale processing factories
 - Agro Fruit Processing Industrial Estate
 - Popular Processing Unit Industrial Estate
 - Fruit Safe Processing Unit Industrial Estate
 - Pakistan Fruit and Juice Company
 - Ijaz Fruit Juice Chowk Kumharanwala
 - Fresher Processing Unit
 - Menta Fruit Juice Company Industrial Estate

- Fresh mango post-harvest facilities (for export)
 - Futfabad Multan
 - Gul Muhammad Wala Multan
 - Wahi Rykki Shujabad

Khanewal

- SAFA Kino Pulp Plant
- Mango Packing Plant

There is no processing facility for horticulture products in Bahawalpur and Muzaffargarh Districts.

Chapter 4 Livestock

The agriculture sector contributes 21 % of GDP of Pakistan, and employs 46% of direct labor force, coming from 67% of population. Out of agriculture, the share of livestock sector is 56%, however, the head count involved in both sectors is the same as livestock and agriculture supplement each other in the rural landscape. The semi-arid and arid climatic conditions of the country coupled with shrinking water resources due to varied reasons have severely undermined the future prospects of crops, if practiced on the prevalent model. Livestock is thus the only rescuer in this backdrop, which has the tremendous potential to climb the ladder of value adding as well.

4-1 Production

The numbers of domestic animals reared in Punjab are summarized in Tables 4-1 and 4-2. In all Punjab, the number of buffaloes is 1.2 times as many as that of cattle while there are more cattle than buffaloes in Multan and Muzaffargarh, the latter of which has twice as many cattle than buffaloes. The availability of water is likely to affect the farmers' choice as buffaloes need more water than cattle while farmers generally prefer buffalo milk to cow's milk. For sheep and goats, the latter is more popular than the former (three times more in Punjab) and the trend is more remarkable in Multan and Bahawalpur.

In addition, the numbers of cattle and buffaloes in Punjab increased 35% and 27% respectively in eight years between 2006 and 2014. The increase rates in Punjab and Pakistan, and the shares of Punjab against all Pakistan for cattle, buffaloes, sheep and goats shows the similar figures (Table 4-1 and 4-2) while the number of poultry has significantly increased (57.5%) in eight years, which resulted in the increase of the Punjab's share (from 35.2% to 49.7%).

Table 4-1. Number of domestic animals reared in Punjab (Livestock Census 2006, Unit: 1,000 head/birds)

Districts	Cattle	Buffaloes	Sheep	Goats	Camel	Poultry
Pakistan	29,559	27,335	26,488	53,787	921	73,648
Punjab (%) ¹	14,412 (48.8)	17,747 (64.9)	6,362 (24.0)	19,831 (36.9)	199 (21.6)	25,906 (35.2)
Multan	499	416	81	594	3.4	728
Khanewal	424	566	156	712	3.0	808
Bahawalpur	550	609	160	1,045	3.1	986
Muzaffargarh	1,172	601	346	1,058	8.2	1,592
Total (%) ²	2,595 (18.0)	2,192 (12.4)	743 (11.7)	3,409 (17.2)	17.7 (8.9)	4,114 (15.9)

Source: Livestock Census 2006, ¹% against Pakistan, ² % against Punjab

Table 4-2. Number of domestic animals reared in KPK (2013-14 Estimated, Unit: million head/birds)

	Cattle	Buffaloes	Sheep	Goats	Camel	Poultry
Pakistan	39.7	34.6	29.1	66.6	1.0	82.1
Increase *	34.3%	26.7%	9.8%	23.8%	8.6%	11.5%
Punjab (%**)	19.5 (49.1%)	22.5 (65.0%)	7.0 (24.1%)	24.6 (36.9%)	0.22 (22%)	40.8 (49.7%)
Increase *	35.4%	26.8%	10.1%	24.2%	10.6%	57.5%

Source: Pakistan Economic Survey 2013–14, Punjab Livestock Sector's Profile at a Glance 2014

* Increase rate in eight years against 2006, ** % against Pakistan

4-1-1 Animal husbandry

The rearing environment in the surveyed districts is open under a combination of in-shed and outdoor feeding due to the dry or semi-dry climatic conditions of the area, and this is supposed to be less stressful to domestic animals. On the other hand, the rearing form in the desert is totally different. In Lesser Cholistan, farmers have 40-50 Cholistani cattle and 100 sheep or goats with several camels. Cattle and camels are released in the morning for grazing and voluntarily come back in the evening. Sheep and goats are grazed with someone from the family. In Greater Cholistan the farmers are totally nomadic. They usually graze within the desert with the basic point of a well while grass is available (monsoon and cooler/ foggy / mild weather seasons), however, they move as far as Dera Ghazi Khan or Rajanpur during the hot weather season.

4-1-2 Feed

A number of farmers grow Egyptian clover (Berseem, *Trifolium alexandrinum*) as forage in winter and sorghum, millet, maize (by mixed cropping) in summer and feed wheat straw and cotton seed cake as well. However, the farmers with no land to crop usually rely on the grass growing around their houses and secondarily feed the animals with wheat straw. In Cholistan Desert, animals are fed on grazing and no feed is given unless special occasions arise (severe drought, necessary fattening before marketing, etc.).

4-1-3 Breeding

Cattle and buffaloes are bred by mating or AI as seen in the other regions of Pakistan. In Punjab, 15% of cattle and 9% of buffaloes are bred by AI (the cost is around Rs. 500 plus transportation expenses) while in Multan and Muzaffargarh, the proportions of cattle and buffaloes bred by AI are twice as high as the average rates of the province. The frozen semen is produced at the three SPUs of the Provincial L&DD and the flow does not satisfy the demand at all as only 1.5 million doses are produced annually for 17 million cattle and buffaloes over three years of age (less than 10%). However, the private SPUs (12 are registered) and the imported frozen semen are helping to achieve the current coverage of AI in Punjab, which implies that increase of frozen semen production is one of the imminent challenges of the Provincial L&DD.

4-1-4 Animal health

As the form of rearing animals is similar, the major animal infectious diseases in Punjab are similar to those in KPK, namely foot and mouth disease, hemorrhagic septicemia, black quarter, anthrax, brucellosis, mastitis, internal parasites and hemoparasites in large ruminants, peste des petits ruminants, contagious caprine pleuropneumonia, enterotoxemia and internal parasites in small ruminants, and Newcastle disease in poultry. The prevalence of the major animal diseases was summarized in Table 4-3 though the data are not totally reliable as the prevalence of brucellosis in Sheikhpura is over 36%. The estimated monthly economic losses of the districts due to the diseases are huge, nevertheless, they are expected to decline as the free vaccination and deworming scheme expands in Punjab.

Table 4-3. Prevalence of the major animal diseases (%) and estimated monthly loss (in Rs.)

Districts	Stomach worms	Hemoparasites	Subclinical mastitis	Brucellosis	Loss (Rs)
Multan	71.9	5.5	6.9	0.6	459,359,647
Khanewal	68.9	13.3	10.0	0	431,004,999
Bahawalpur	94.0	1.6	3.4	0	906,149,821
Muzaffargarh	54.8	17.7	20.0	0	858,055,508
Punjab	52.6	11.3	19.9	5.2	12,701,062,791

Source: Livestock & Dairy Development "The Policy Papers"

4-2 Marketing

There are two major marketing routes for raw milk in Punjab; 1) from farmers to dairy companies and retailers through middlemen and 2) from contract farmers to major dairy companies through milk collecting centers. Besides, direct buy and sell between farmers and neighbors or retailers are also common but the quantity cannot be counted into the official data since the marketing is irregular. Pakistan is the third largest milk producer in the world and the production is about seven times as much as that of Japan.

For meat as well, marketing is often mediated through middlemen. Even in other cases, animals have to be slaughtered at the official slaughterhouses, where they are recorded as statistical data. There are only six large-scale modern slaughterhouses even in Lahore. The meat production in Pakistan is not remarkably high probably due to the undeveloped male cattle fattening industry but the production is still four times larger than that of Japan.

4-3 Management

The proportion of small-scale farms with less than 10 cattle or buffaloes is around 96.5% in Punjab, where 75.5% of cattle and 73.5% of buffaloes are reared on those small-scale farms. Accordingly, increase of animal productivity through improvement of feed, breeding and animal health is inevitable for the farmers, leading to the growth of milk production in Punjab.

The farmers usually consume 4-5 kg of milk domestically every day and sell the surplus to earn daily income. The market price of milk is about 20 Rs./kg cheaper than that of KPK, and moreover, middlemen take the margin of 20 Rs./kg, which considerably reduces the prospective cash income of small-scale farmers.

4-4 Product processing

There are a number of dairy companies producing processed dairy food such as Nestle in Punjab, which are listed up in the following site (Pak Dairy Info), and various information (contacts, addresses, homepages, etc.) can be accessed.

http://www.pakdairyinfo.com/milk_processing_dairy_companies.htm

4-5 Research and development

A variety of researches have been conducted at the research institutions and universities and the details can be found in the homepage of Provincial L&DD

(<http://www.livestockpunjab.gov.pk/View.aspx?Type=TopMenu&itemId=1726>). In addition, the Veterinary Research Institute has been studying the ambiguous current conditions and vaccine development of diseases such as viral arthritis, femur head necrosis, hydropericardium syndrome, infectious bursal disease, infectious broncheitis, infectious laryngotracheitis and avian influenza.

4-6 General condition and potential of biomass power generation

The biomass power generation is still in the research phase and hasn't been practically applied to the field as in KPK. However, large-scale biogas plants as fuel for boiler have been under construction at the 6 slaughterhouses in Lahore and there is talk of a plan to utilize a biogas plant could as a countermeasure against animal excrement disposal.

Chapter 5 Community Organization and Extension

5-1 Administrative units/roles, structure and actual state of communities and roles in rural development

5-1-1 Administrative unit

Provinces of Pakistan are divided into four administrative units which are district, Tehsil (under District), Union Council (under Tehsil), and village (the smallest Unit under Union Council). Punjab Province has 36 districts and Multan District of Punjab Province has four Tehsils and 185 Union Councils, Khanewal District has four Tehsils and 135 Union Councils, Bahawalpur has five Tehsils and 109 Union Councils, and Muzaffargarh District has four Tehsils and 111 Union Councils.

5-1-2 Ethnic groups, tribes, languages, and structure of the community in Punjab

Punjabi is the major ethnic group in Punjab Province, and there are several Biradari as endogamy under one ethnic group such as Malik, Choudhry, Watto in Punjab Province¹. Marriage is mainly conducted within Biradari and the tie of Biradari is used for economic nomads. One of the major characteristics of the Pakistani rural area is that most of the farming population is comprised of the class of non-farming families, and landless non-farming families are likely to be poorer than farmers². The feudalistic system of tenancy of landowners is rooted in South Punjab and Sindh provinces as an inheritance of the caste system to limit people's occupational fields³. The language spoken around Multan in South Punjab is Saraiki and Saraiki spoken group established their ethnic identity in around 1960 and the political movement of Saraiki spoken group to be independent as a Saraiki province was conducted in 1983⁴. The language spoken in Khanewal in South Punjab is Punjabi. Punjabi language is similar to Urdu, hence speakers of Punjabi have an advantage in passing the examination of higher civil servant than speakers of Pashto and Balochi⁵.

5-1-3 Structure and actual state of the community and role in rural development in South Punjab

They are mainly categorized into three types: Traditional community organizations such as Panchayat⁶, pre-existing Community Organizations which are created within the community to support the members, and Community Organizations (CO) which are formed by NGOs.

The pre-existing Community Organizations and COs play significant roles for improvement of livelihood, community development as well as empowerment of females. In addition, mosques are used for agriculture, livestock and community developments as well.

PRSP (Punjab Rural Support Programme) and NRSP (National Rural Support Programme), which are local

¹ Aid of country distinction workshop report Islamic Republic of Pakistan, 2003, JICA, P86

² The Policy of Agriculture and Rural Development Islamic Republic of Pakistan (Final Report), 2005, IDCI, P. PAK(R)-15

³ *ibid*, P. PAK(R)-15

⁴ Aid of country distinction workshop report Islamic Republic of Pakistan, 2003, JICA, P88

⁵ *ibid*, P88

⁶ Panchayat is South Asian political system. Panchayat means "assembly" (*ayat*) of five (*panch*). Panchayat consisted of wise and respected elders chosen and accepted by the local community. These assemblies settled disputes traditionally between individuals and between villages.

NGOs, have been working for the community development through forming Community Organizations in the sector of agriculture, livestock and other sectors of community development in South Punjab. The following three organizations are formed by NRSP and PRSP: Community Organization (CO) at village level, Village Organization (VOrg) which consists of two members selected from each CO, and Local Support Organization (LSO) at Union Council level. LSO is in charge of coordinating with concerned authorities to solve issues which are addressed by each CO and VOrg. Table 5-1 shows the number of community organizations formed by PRSP in Muzaffargarh and Khanewal in South Punjab.

Table 5-1. Number of Community Organizations formed by PRSP in two districts in South Punjab

Districts/Community Organization	No of male organizations	Male organization/sex ratio (%)	No of female organizations	Male organization/sex ratio (%)
Muzaffargarh				
CO	1,594	53	1422	47
VOrg	91	44	116	56
LSO	12	100	-	-
Khanewal				
CO	1,111	51	1,069	49
VOrg	36	49	38	51
LSO	4	100	-	-

Source: PRSP as of May 2016

On the other hand, there are groups of female livestock extension workers which were formed by the Dairy Project of USAID (Agency for International Development) – DRDF (Dairy and Rural Development Foundation) in Multan, Khanewal, Bahawalpur, Lodhran and Vehari Districts. According to the findings from the interviews to female livestock extension workers in Bahawalpur, this community group contributes to improve the production of livestock through the female livestock extension workers in the communities where the District L&DD cannot extend its extension service. Furthermore, the livelihood of female members interviewed is improved and they feel more confident in themselves after joining the group and working as livestock extension workers. This shows that the female livestock extension workers were empowered by acquiring the skill and improving their livelihood through the community group activities. Hence, the community groups play a role in community development as well as empowerment of females.

The community groups which are formed by community members such as micro finance groups to support each other and farmers' associations in South Punjab to improve their livelihood are observed.

In addition, mosques are used for the community development by the District Officers Agriculture (EXT) and the District L&DD, and for Islamic Micro finance by providing seed and loan distribution as well as announcement of events and trainings.

5-2 Number, roles and actual status of extension staff

5-2-1 Number, roles and actual status of extension staff in the District Officer Agriculture (EXT)

In the District Officer Agriculture (EXT) of Punjab, Agriculture Officers (AO) and Field Assistants (FA) are responsible for the extension services for farmers to transfer modern production technologies, monitor agriculture inputs, implement agriculture laws and execute development projects to improve the livelihood of farmers through increasing productivity and sustaining agriculture.

The Farmers Training Programme is one of the major extension activities by the AO, and it provides trainings at village level to farmers to improve the knowledge of around 10 major crops such as cotton, sugarcane, rice, wheat, gram, maize, ground nuts, mango, cardamom and sunflower regarding crop management as well as measures against pests. In addition to this, the Farmers Field days as workshops and events at Union Council level to promote targeted crops to farmers are conducted. And also, mass media publicity such as TV, radio and posters are also utilized as an extension. The Directorate General Agriculture (EXT & AR) in Punjab Province provides 24 hours helpline for farmers to consult any queries regarding agriculture on the phone. The Plant Clinics assisted by CABI (Centre for Agriculture and Biosciences International) are established in markets and roads to provide consultation of agriculture to the farmers. The Directorate General Agriculture (EXT & AR) implemented for the FFS (Field Farmers School) from 2006 to 2013 in Punjab Province. However, the budget was not allocated for FFS by the government, therefore it is discontinued. It is crucial for the government to allocate the budget for FFS in order to be sustainable.

The monitoring for the trainings is conducted by the Research Wings of the Secretary Agriculture. The extension staff submits daily activity reports to the provincial Directorate General Agriculture (EXT & AR) through their mobile phones.

It is required to have a university degree related to agriculture for AO, and a diploma of three year Agriculture Science course from In-Service Agriculture Training Institutes (IATI) in R.Y.I Khan, Sargodha, Rawalpindi, Karor districts in Punjab Province for FA. The Directorate General Agriculture (EXT & AR) of Punjab Province employs 481 male AOs, 150 female AOs and 3,202 male FAs. Table 5-2 shows the number of AOs and FAs in District Officer Agriculture (EXT) in Multan, Khanewal, Bahawalpur and Muzaffargarh in South Punjab. The number of female extension staff is less than male staff and there are no female FAs. This means that the outreach of extension services to female farmers is limited since only female extension staff can contact female farmers due to social norms. The Secretary Agriculture applied a quarter of seats for females with the ratio of 15% in 2016 and it is expected to increase female AOs in the future. However, female FA is not expected to increase in number because there is no vacancy for female students in IATI. According to the staff of District Officer Agriculture (EXT) in the four districts, FA position is not appropriate for female due to social norms.

Table 5-2. Number of AOs and FAs in District Officer Agriculture (EXT) in four districts in South Punjab

District	AO (male)	AO (Female)	FA (male)	FA (Female)
Multan	8	1	49	0
Khanewal	19	1	89	0
Bahawalpur	9	3	86	0

Muzaffargarh	14	3	106	0
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Source: the table has been prepared by the Team based on the interviews and documents from the District Officer Agriculture (EXT) in the four districts.

As for the actual status of extension services, it is observed that the services by AO and FA do not reach farmers to a satisfactory extent due to the shortage of extension staff. Approximately 7 to 20 Union Councils are assigned to 1 AO and around 1 to 2 Union Councils are assigned to 1 FA, which shows shortage of staff to cover the assigned areas. For example, the coverage of the extension service in the District Officer Agriculture (EXT) in Khanewal to farmers is around from 10% to 15%.

5-2-2 Condition and actual status of extension activity of the District L&DD

The Veterinary Officer (VO) and Veterinary Assistant (VA) of the District L&DD as extension staff take both roles in animal health and extension services such as diagnostic, vaccination, AI service, extension activities to spread necessary knowledge and skill to increase production of livestock for farmers in Punjab Province. The District L&DD promotes Farmers' Days to promote livestock management, vaccination and deworming and raise awareness of farmers through workshops and seminars. Furthermore, the extension staff visit middle schools to promote the knowledge of disease and livestock management through the School Focus Program. This has ripple effect in that the message spreads to parents through the students.

As for the actual status of the extension services by the District L&DD in Multan, Khanewal, Bahawalpur, Muzaffargarh, it is observed that there are four major challenges. Firstly, it is observed that the services by VO and VA do not reach fully farmers due to the shortage of extension staff. For instance, around five Union Councils are assigned to one VO and around two Union Councils are assigned to one VA in the District L&DD in Khanewal, which means it is not possible for the extension staff to cover assigned areas. Secondly, the coverage of extension service by female extension staff to female farmers is less due to the shortage of female extension staff. Thirdly, the female extension staff face the problems with transportation. It is difficult for female staff to ride motorbikes due to social norms; therefore, female extension staff use public transportation. Finally, training programs to extension staff are needed since training is not conducted in the past apart from 1-day training of sampling to FAs.

5-3 Actual situation and conditions of veterinary officers

Seven universities in Punjab have 5-year courses of veterinary medicine, and graduates (a total of 1,000/year approximately) are qualified as veterinarians and can apply for the VO position of the L&DD. Currently another veterinary school is under construction in Bahawalpur with support from the U.K. The total number of VOs in Punjab is 1,703, of which 143 are female (8.4%). The district L&DDs are providing clinical services to farmers and there are also private veterinary clinics, on which a number of farmers are actually relying. However, the majority of the clinicians are not veterinarians but diploma holders and some of them do not even carry any qualification, which implies that the number of clinical veterinarians is not sufficient. For example, in Khanewal one VO is claimed to be in charge of 78,900 animals by simple calculation.

5-4 Actual situation and conditions of veterinary assistants

Livestock Assistant Diploma (2-year course) is necessary to become veterinary assistant (VA). A total of 9 courses are available in Livestock Services Training Center and Barani Livestock Production Research Institute of Provincial L&DD and four universities in Punjab. Several of the courses are only for male students though the number of the students and the proportion of boys to girls in each course were not surveyed. The total number of VAs and AITs in Punjab is 3,829, of which 28 are female (0.73%). The number of VAs and AITs is more in Muzaffargarh than the other three districts and no female staff are allocated in Khanewal. They are usually posted at Veterinary Hospitals, Dispensaries or Centers and engaged in veterinary treatment, AI and vaccination activities. The duties for VAs and AITs are totally the same and they must be registered as AI practitioner with Livestock Breeding Authority. Some of the diploma holders engage in clinical work as private clinicians.

5-5 Actual situation and conditions of the development projects by the Provincial L&DD

The ongoing and scheduled livestock development projects by the Provincial Government were summarized in Table 5-3.

Table 5-3. The livestock development projects by the Provincial Government

Name of the Projects	Period	Budget
Strengthening of Balani Livestock Production Research Institute, Kherimurat, District Attock	2014–2016	26.0
Strengthening of Buffalo Research Institute, Pattoki, District Kasur	2011–2016	147.8
Restructuring & Reorganization of Breeding Services in Punjab	2010–2016	517.4
Poverty Alleviation of Poor Women through Provision of Heifer and Sheep/Goats in Punjab	2014–2018	2,160.0
Establishment of Model Veterinary Hospital at One Tehsil of Each Division in Punjab	2014–2016	352.0
Conservation, Development & Propagation of Dhani, Lohani & Dajal Breed of Cattle in Punjab	2014–2017	42.4
Enhancing Dairy Production through Exotic Semen	2014–2017	91.0
Completion of Remaining Civil Work under All Phases of Support Services Project for Livestock Farmers	2014–2016	88.0
Preservation of Fodder as Silage at Livestock Experiment Stations in Punjab	2014–2017	121.8
Productivity Enhancement through Genetic Improvement of Small Ruminants/Up Gradation of Facilities at Livestock Experiment Station	2014–2017	180.0
Prophylactic Measures and Sero-surveillance of Camels and Camel Milk Processing	2015–2017	84.1
Establishment of Regional Reference Diagnostic and Surveillance Laboratories in Punjab	2015–2017	72.4
Rehabilitation & Mechanization of Governmental Livestock Farms & Livestock Experiment Stations (Khushab, Shergarh, Jugaitpeer, Fazilpur & Rakh Ghulaman)	2015–2018	368.3
Enhancing Beef Production in Punjab Phase II	2015–2018	280.1

Source: Provincial L&DD, * Unit for the budget: million rupees

Chapter 6 Access to Finance

6-1 Asset holdings of small-scale farmers

6-1-1 Number of small-scale farmers by size of farm in South Punjab in Punjab Province

Punjab Province has the second highest ratio of small-scale farmers (less than 3ha), more than Sind and Baluchistan provinces but less than KP. According to the Agriculture Census 2010, the ratio of small-scale farmers in KP is 89 %, Punjab is 79%, Sind is 70% and Baluchistan is 50%. That of Muzaffargarh is 83%, Multan is 82%, Bahawalpur is 81% and Khanewal is 80%, which is higher than the average of Punjab Province (Table 6-1).

Table 6-1. Number and area of farms by size of farms in four districts in South Punjab and Punjab Province

Size of farm (ha)	Punjab		Multan		Khanewal		Bahawalpur		Muzaffargarh	
	No of farms	%	No of farms	%	No of farms	%	No of farms	%	No of farms	%
Under 0.40	729981	14	19402	18	17132	13	36408	21	74215	25
0.40 - 1.01	1473113	28	34630	33	42918	32	49435	28	81686	28
1.01 - 2.02	1144394	22	20653	19	29968	22	31795	18	49465	17
2.02 - 3.04	792342	15	12486	12	17758	13	23547	14	38262	13
3.04 - 5.06	620261	12	10599	10	14513	11	14731	8	28646	10
5.06 - 10.12	359408	7	6261	6	9484	7	12391	7	15904	5
10.12- 20.23	96590	2	1391	1	3531	3	4403	3	3766	1
20.23 - 40.47	25015	*	489	*	667	*	848	*	707	*
40.47 - 60.70	4655	*	157	*	148	*	274	*	106	*
60.70 and above	4062	*	101	*	96	*	140	*	89	*
Total	5249804	100	106167	100	136213	100	173972	100	292843	100

Source: Agriculture Census 2010, Note: * means 0.5

6-1-2 Asset holdings of small-scale farmers in South Punjab

The tendency of asset holding ratio of agriculture machinery (tractor, tube well/pump, thresher, sheller, combined harvester, reaper/harvester, drill and spray machine) of small-scale farmers in Multan, Khanewal, Bahawalpur and Muzaffargarh is as follows. Firstly, the assets holdings ratio of sheller, combined harvester, reaper/harvester of small-scale farmers is lower than other machineries. The ratio is from around 1% to 3%. Secondly, the ratio of asset holding of spray machines among small-scale farmers is higher than the ratio of other machines. The ratio is from 12.27% to 44.80%. Thirdly, the assets holding ratio of tractor, tube well/pump, thresher, and drill of small-scale farmers increases from farmers who own more than 1.01 ha. Finally, the assets holding ratio of tube well/pump of small-scale farmers in Muzaffargarh is higher than other three districts.

As a result of the interviews to the small-scale farmers in Multan, Bahawalpur and Muzaffargarh, landless small-scale farmers are likely to have few livestock and own a hand pump for each household. While,

small-scale farmers (more than 0.60 ha to 2.83 ha) are likely to own more livestock (average number of six head), fruit trees, agricultural machineries such as tube well/pump and tractor, and motor bikes than landless farmers.

6-2 Fundraising of small-scale farmers

6-2-1 Outreach of micro finance banks, institutes and NGOs

The outreach of micro finance in Punjab Province is by far higher than KP, Sind and Baluchistan provinces. There are 13 offices of micro finance banks/institutions/NGOs and 98 units (Table 6-2): The total number of borrowers is 127,717 in Multan District. According to Table 6.2, there are 12 offices, 50 units and 126,359 borrowers in Bahawalpur. There are 13 offices, 37 units and 81,749 borrowers in Muzaffargarh, and nine offices, 29 units and 52,271 borrowers in Khanewal. The number of units and borrowers in Multan is higher than other three districts.

Table 6-2. Outreach of micro finance banks, institutes and NGOs in four districts in South Punjab

District	Number of branches/unites		Microcredit	Micro finance banks, institutes and NGOs	
	Fixed	Mobile	Active borrowers	No	Abbreviation of name
Multan	98	-	127,717	13	AKHU, AMFB, ASA, BRAC, FINCA, FMFB, KASHF, KB, NRSP, NRSP-B, TMFB, UBank, WMFB
Khanewal	29	-	52,271	9	AKHU, ASA, FINCA, KASHF, KB, NRSP-B, PRSP, TMFB, WMFB
Bahawalpur	50	-	126,359	12	AKHU, AMFB, ASA, FINCA, FMFB, KASHF, KB, NRSP, NRSP-B, TMFB, UBank, WMFB
Muzaffargarh	37	-	81,749	13	AGAHE, AKHU, ASA, FFO, FINCA, KASHF, KB, MOJAZ, NRSP-B, PRSP, TMFB, UBank, WMFB

Source: *Micro WATCH A Quarterly Update on Micro finance Outreach in Pakistan*, Issue 38: Quarter 4 (Oct-Dec 2015), Pakistan Micro finance Network

6-2-2 Fundraising of small-scale farmers in South Punjab

The small-scale farmers can access mainly three types of micro finance which are micro finance banks/institutions/NGOs, community organization groups and personal network in Multan, Khanewal, Bahawalpur and Muzaffargarh in South Punjab. The condition of micro finance loans is less than general banks, which means small-scale farmers have better access to loans. Besides, there are successful cases by improving the livelihood of small-scale farmers through micro finance services.

Firstly, the FINCA micro finance bank (FINCA) is one of the micro finance banks in the four districts. FINCA has around 3,188 borrowers for agriculture loan and 796 for livestock loan. The bank provides loan services at the amount from 25,000 PKR to 150,000 PKR for agriculture loan and from 35,000 PKR to 150,000 PKR for livestock loan at an interest rate from 25% to 33%. It requires to have 1 guarantee for the loans. The participation rate of females is very low in the four districts. For example, FINCA has only 1 female out of 674 borrowers for the loans in Muzaffargarh.

NRSP Micro Finance Bank (NRSP-B) is also one of the major micro finance banks in the four districts. NRSP-B has around 94,225 borrowers for agriculture loan, 4,559 for livestock and 20,706 for enterprise loan (Table 6-3). It illustrates that the number of borrowers of agriculture loan is higher than livestock and enterprise loans. The ratio of small-scale farmers of the borrowers is around 66%, which shows higher access to finance by small-scale farmers. The bank provides loan service at the amount less than 50,000 PKR at an interest rate of 28%. It requires borrowers to form groups for agriculture loans, farmers to hold less than 6.07 ha for livestock loans, and all applicants to hold ID for business loans.

Table 6-3. Number of borrowers of NRSP-B in four districts in South Punjab

Loan type	Number of borrowers by districts				Total by loans
	Multan	Khanewal	Bahawalpur	Muzaffargarh	
Agriculture loan	17,008	15,427	33,825	27,965	94,225
Livestock loan	84	456	3,583	436	4,559
Enterprise loan	2,379	2,367	7,570	8,390	20,706
Total by districts	19,471	18,250	44,978	36,791	119,490

Source : NRSP Micro Finance Bank as of April 2016

Akuwat is one of the major Islamic micro finances in the four districts. Akuwat is based on the brief of Islamic religion that ones who have or do not have should share resources and established in 2001. Akuwat provides interest free loan for people in need. Akuwat has currently 500 offices in Pakistan and 1,200,000 borrowers. As a result of the interviews to Akuwat in Multan, Akuwat has 25 officers and 50 borrowers are small-scale farmers out of 5,871 borrowers (3,259 female). The bank provides loan service at the amount less than 50,000 PKR. It requires borrowers to form groups. The loan is handed over to borrowers at mosques.

NRSP is one of the major NGOs which provide micro finance service to farmers in Khanewal and Muzaffargarh. NRSP has 5,635 male borrowers and 2,555 female borrowers in Muzaffargarh, and 17,136 male borrowers and 11,127 female borrowers in Khanewal. This shows that female borrowers are involved in the loans. NRSP provides three type of loans which are agriculture loan (around 19%), livestock loan (around 47%) and enterprise loan (around 34%). NRSP provides loan services at amounts of approximately 15,000 PKR to 40,000 PKR at an interest rate of 25%. It requires borrowers to be community group members. There are many successful cases where the borrowers have improved their livelihood through the loans, not only NRSP but also FINCA, NRSP-B and Akuwat.

Secondly, some of the community organizations are likely to have micro finance within the group to support each other. It works as a method to improve farmers' livelihoods.

Thirdly, small-scale farmers have access to finance from personal networks such as family members, relatives, friends, landowners, contractors and Arthi⁷. The interest rate varies depending the relationship between farmers

⁷ Arthi is a money lender and commission agent. Arthi is seen as the exploitative money lender, charging high rate of interest, trapping borrowers in a vicious cycle.

On the other view, Arthi is seen as a service provider fluffing the credit need for farmers in the rural areas.

and contractors and Arthi.

Thus, small-scale farmers have access to finance through micro finance banks, institutions, Islamic micro finance, NGOs, community organizations and personal network with accessible conditions in the four districts. Micro finance service contributes to improvement of farmers' livelihoods.

6-3 Farming income and additional income

6-3-1 Farming income and additional income in Punjab

Table 6-4 shows that the ratio of monthly household income sources in rural area in Punjab, KP, Sind and Baluchistan provinces. Wages and salaries are higher than other sources. On the one hand, the %age of monthly household income from livestock of Punjab is higher than the other three provinces. The distribution of monthly household income sources in rural area in Punjab is 25.11% for wages and salaries, 20.56% for crop production, 15.08% for livestock, 12.87% for other source apart from agriculture. It shows that the ratio of monthly household income from wages and salaries as well as agriculture crop are higher than livestock in the rural area in Punjab. For wages and salaries in urban area in Punjab, it is higher than rural area. On the other hand, for crop production, livestock, foreign remittances, domestic remittances in rural area in Punjab are higher than urban area.

Table 6-4. %age distribution of monthly household income by source of four provinces in Pakistan

Source Income	Punjab Province		Punjab Province		Sind Province		Baluchistan Province	
	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)	Urban (%)	Rural (%)
Wages and Salaries	39.00	25.11	45.15	30.15	63.62	43.01	52.07	44.68
Crop Production	3.57	20.56	1.01	6.97	0.94	25.07	1.55	21.60
Livestock	1.53	15.08	0.62	9.63	0.94	12.34	1.06	7.13
Other Non Agri Activities	28.75	12.87	22.51	13.73	14.59	6.17	24.19	12.40
Property (Owner Occupied House Excluded)	3.71	2.57	4.47	2.37	2.53	3.02	5.84	2.60
Owner Occupied Houses	11.28	6.24	11.47	6.11	13.22	6.66	10.86	7.54
Social Insurance Benefits Including Pension	3.03	2.15	3.37	2.10	1.55	0.63	3.10	0.30
Gift & Assistance	1.2	3.68	1.76	4.95	1.19	2.34	0.83	1.87
Foreign Remittances	4.72	5.68	5.63	12.38	0.71	0.42	0.74	1.32
Domestic Remittances	2.79	5.74	3.72	10.57	0.70	0.15	0.03	0.62
Other Sources	0.43	0.32	0.28	1.04	0.00	0.19	-0.27	-0.06
Total	100	100	100	100	100	100	100	100

Source: Household Integrated Economic Survey (HIES), (2013-14)

Reference: *Who is the "arthi": Understanding the Commission agent's role in the agriculture supply chain*. Aban Haq, Amal Asalam, Aqeel Akbar Chaudhry, Asad Naseer, Kabeer Muhammad, Khalid Mushtaq, Maheen Saleem Farooqi, IGC international Growth Centre, 2003, P32

6-3-2 Farming income and additional income in South Punjab

According to the results of the interviews with small-scale farmers in Multan, Khanewal, Bahawalpur and Muzaffargarh, landless small-scale farmers as well as farmers who own land ranging from 0.06 ha to 1.01 ha depend on income from wages and daily labor work. On the other hand, small-scale farmers who own land ranging from 2.02ha to 2.83ha gain income from mainly agriculture, and livestock is the second source. The small-scale farmers have fruits trees such as dates, citrus and beer for mainly household consumption and mango trees are for selling purpose.

Chapter 7 Access to Land and Social Structure

7-1 Access to land

The proportion of small-scale farmers (smaller than 2 ha) is 63.8% in Punjab and about 70% in the surveyed four districts, which is relatively high but lower than that in KPK (around 80%). Nevertheless, the proportion of landed farmers is over 80% and similar to that of KPK, which implies that the landed farmers are more among the larger-scale farmers. In addition, the average land size of small-scale farmers is 0.78 ha in Punjab, which is 30% larger than that of KPK (0.6 ha). In terms of tenure classification of farms, no large difference in farm size is acknowledged between owners, owner cum tenants and tenants (around 1.0 ha/farm) though the sizes are relatively small in small-scale landed farmers (0.6–0.8 ha/farm).

7-2 Social structure

Two thirds of Pakistan's total population reside in the rural areas, where all of the rural population is not necessarily engaged in agriculture for a living⁸. Rural households can be categorized largely into two: farm- and non-farm households. The former comprises the households of: 1) landowners; 2) farmers (farming their own land); 3) sharecroppers; and 4) agriculture laborers. The latter comprises the households of traditional artisans and unskilled-laborers.

In the rural society of Pakistan, including South Punjab, there remains a status hierarchy based on the Hindu caste system. In rural Pakistan, landowning households, called as *zamindars*, are placed in a higher status, while artisan households associated with crafts of a blacksmith, carpenter, cobbler, weaver, pottery, barber, etc., called as *kammi*, are placed in a lower status. *Kammi* used to serve *zamindars* with their crafts and labor work in exchange for the food provided by *zamindars*. Such a traditional master-servant relation between *zamindars* and *kammi* is known as *Seyp* system, on which *kammi* used to exclusively depend for their livelihoods. However, the system has gradually disappeared from the rural society in accordance with the progress of money economy even in rural Pakistan and the migration of many rural people to cities for looking for better jobs.

Despite the fade-out of *Seyp* system, the caste-based hierarchy in the rural society is kept mainly through endogamy. In rural South Punjab, marriage is arranged only within the kinship associated with the same occupational caste⁹. While kinship ties (*biradari*) have been made stronger through endogamy, *kammi*, in particular, have lost an opportunity to transform their birth-ascribed status due to endogamy.¹⁰ Due to their discrimination against *kammi*, *zamindars* do not accept any inter-caste marriage, especially marriage between their women and *kammi* men, which tends to cause 'honor killing'. On the contrary, *kammi* do not accept inter-caste marriage because of their pride¹¹.

⁸ http://open_jicareport.jica.go.jp/pdf/12044426_01.pdf

⁹ Usman, Ahmed and Amjad, Asisha. 2013. "Caste Based Endogamy in a Punjabi village of Pakistan." *South Asian Studies*, Vol. 28, No. 2, July – Dec. 2013, pp. 341-352.

¹⁰ *ibid.*

¹¹ *ibid.*

Chapter 8 Gender

8-1 Gender in Pakistan and Punjab Province

8-1-1 General profile

The Government of Pakistan has made efforts to promote gender equality to some extent since it has signed and ratified the Convention for the All Forms of Discrimination against Women (CEDAW) in 1996. However, there exist a critical problem in that Islamic Laws and Custom Laws which are not necessarily compatible with State Laws are widely applied to the actual lives of people in Pakistan, and these tend to violate against women's rights¹². Based on "Hudood Ordinances" and "Law of Evidence", many of the women victims of rapes are not able to testify that they are victims, and rather end up with being prisoned for "zina"¹³. Similarly, through the male-dominated community reconciliation system of "jirga", gender-based violence (GBV) cases tended to be solved in favor for men. Under Islamic Laws, women are entitled only to a half of what men are supposed to inherit, but, in reality, most of women give up even that right for their brothers¹⁴. Thus, women in Pakistan do not necessarily enjoy equal rights, as men do, which are ensured under the Constitution and other State Laws.

In Pakistan, girls and women are widely considered to be commodities of men's: 1) fathers' until they get married; and 2) husbands' after they get married¹⁵. Due to the good reason that men are supposed to protect girls and women from any risks, men tend to control girls and women's freedom of mobility through the social custom of 'purdah' or segregation between men and women¹⁶. As a result, many girls and women are prevented from going to school and working outside home without the permission of their fathers', husbands', or other family members' permission. This has largely contributed to very low levels of women's literacy rate, very low level of female labor participation and lower income, very low level of modern family planning prevalence, and high birth rate. The social custom of *purdah* has determined and perpetuated the gender division of space and gender division of labor/roles. Based on the gender division of labor/roles and unequal gender relations, many women in Pakistan need to rely on men for almost all aspects¹⁷.

8-1-2 Gender Gap Index

According to the World Economic Forum, Pakistan is ranked the 144th out of 145 countries in the world for Gender Gap Index (GGI) 2015. GGI evaluates a country-wise gender gap in economic participation, educational level, health condition, and political participation. Even among countries in South Asia, Pakistan is ranked the lowest in 2015. Since 2006, there has been few changes in the ranking of Pakistan for GGI, moving only from

¹² Based on the review comments for the Government of Pakistan's 4th periodic report by the CEDAW Committee

¹³ http://daigakuin.soka.ac.jp/assets/files/pdf/major/kiyou/19_houritsu4.pdf (latest access on March 22, 2016)

¹⁴ <https://sdpi.org/publications/files/Microsoft%20Word%20-%20policy%20Brief%2023.pdf> (pp. 2. Latest access on March 24, 2016)

http://www.landesia.org/wp-content/uploads/2011/01/RDI_Report_WJF_Womens_Inheritance_Six_South_Asian_Countries_December_2009.pdf
(pp. 59-61. Latest access on March 24, 2016)

¹⁵ http://www.af.org.pk/pub_files/1366345831.pdf (latest access on March 24, 2016)

¹⁶ *ibid.*

¹⁷ *ibid.*

the worst second to the worst fourth.

8-1-3 Educational level for men and women

Due to the international initiatives of Education for All (EFA) and Millennium Development Goals (MDGs), the promotion of girls and women's education is taken into account by the government, international organizations/bilateral donor agencies, and NGOs. As a result, there has been a drastic increase in women's literacy over the last three decades although it does not meet the MDG. Women's literacy rate increased from 19% in 1980's to 40% in 2000's and 47 % in 2013-14¹⁸. The Gender Parity Index (GPI) in literacy rate, enrollment rate for primary education, and enrollment rate for secondary education has been improved gradually, which is far behind the MDGs¹⁹.

In Pakistan, there is a huge gap in literacy rate and enrollment rate for primary education not only between sexes, but also between four Provinces and between rural and urban areas. Female literacy rate of Punjab Province is 53.3% in 2013-14, which is the highest rate among four Provinces and higher by 8.2 points and 24.6 points than KP Province and Balochistan Province, respectively²⁰. While there is 20.8 point-difference in the literacy rate between rural men and rural women in Punjab, there is 38.9 point-difference and 43.7 point-difference between the two in KP and Balochistan, respectively²¹. In the enrollment rate of urban boys for primary education, there is not a much difference among four Provinces, but female ones vary by Provinces. The enrollment rate of urban girls for primary education is 65% in Punjab, 46% in KP, and 36% in Balochistan²². More problematically, the rate of rural girls is quite low: 37% in Punjab, 15% in Sindh, and 11% in Balochistan²³.

According to the Pakistan Social and Living Standards Measurement (PSLM) 2010/11, the target districts of Bahawalpur, Khanewal, Multan, and Muzaffargarh in Punjab Province marked a lower literacy rate by sex and by areas than the rate of whole Punjab Province. Among those four districts, there is a huge gap in the literacy rate and net enrollment rate for primary education between rural men/boys and rural women/girls and between urban women/girls and rural women/girls. For example, the gender gap of literacy rates in rural area of Bahawalpur, Khanewal, and Muzaffargarh is 20 points, 32 points, and 29 points, respectively. Similarly, reasons/constraints for children's not going to school vary between boys and girls and between urban and rural areas. Based on PSLM 2013-14, the majority of urban boys and rural boys (29% and 28%, respectively) share the same economic reasons for their not attending school. However, the majority of girls in rural Punjab (37%) chose as a main reason their parents' objection (due to *purdah*) whereas the majority of girls in urban Punjab (40%) chose economic reasons.

¹⁸ Economic Survey 2011-12 and PSLM 2013-14.

¹⁹ PBS. 2015. *PSLM 2013-14*. Islamabad: PBS.

²⁰ PBS. 2015. *Pakistan Labour Force Survey 2013-14*. Islamabad: PBS.

²¹ *ibid*.

²² PBS. 2015. *PSLM 2013-14*. Islamabad: PBS.

²³ *ibid*.

8-1-4 Labor participation of men and women

The labor participation rate of women in Pakistan is comparatively quite low in world terms. According to Pakistan Labor Force Survey 2013-14, the labor participation rate of women in Pakistan is only 22.2% while that of men is 68.1%. The social custom of *purdah* may contribute to this low rate of women's labor participation. Although there is not much difference in the labor participation rate between urban men and rural men, there is a huge gap in the rate between urban women (10.2%) and rural women (28.9%)²⁴. This implies that women's labor participation concentrates in the agriculture sector in Pakistan. Approximately two thirds of working women belong to the agriculture sector whereas 34.2 % of working men belong to the agriculture sector, 14.7% to the manufacturing sector, 9.5% to the construction sector, and 18.5% to the wholesale and retail sector²⁵. Another problem faced by working women is that 55% of working women still work as helpers for family business (agriculture), which implies that they are unpaid workers²⁶.

8-2 Gender policy and gender mainstreaming in Punjab Province

8-2-1 Provincial machinery for gender equality and gender mainstreaming in Punjab Province

Based on the 18th Constitutional Amendment Act in 2011, the power and mandates entitled to the Ministry of Women at the national level was handed over to the provincial governments. In Punjab Province, Women Development Department, in cooperation with Provincial Commission on the Status of Women (PCSW), takes responsibilities mainly for policy and legislative arrangement for gender equality and women's empowerment in the province. The department functions only as policy-making body which leads other relevant line departments to gender mainstreaming. Thus it does not have the implementing structure at the district level.

8-2-2 Gender policy in Punjab Province

In 2012, Women Development Department has developed 'Punjab Women Empowerment Initiatives/Packages'. The Initiatives mainly focused on 1) legislative and administrative reforms; 2) employment in the public sector and women's economic empowerment; 3) education; 4) health; and 5) strengthening of implementation/administrative structures. Those were revised in 2014 and 2016.

8-2-3 A Gender perspective integrated in the agriculture sector of Punjab Province

The government of Punjab Province has developed 'Punjab Growth Strategy 2018' and aimed to meet the 8% of annual growth rate by 2018. A gender perspective has not been integrated in the target sectors, including agriculture and livestock management. There are a couple of projects which target poor women in rural areas, including 'Punjab Skill Development Fund Project' and 'Poverty Alleviation of Poor Women through Provision of Heifer and Sheep/Goats in Punjab'.

²⁴ PBS. 2015. *Pakistan Labour Force Survey 2013-04*. Islamabad: PBS.

²⁵ *ibid.*

²⁶ *ibid.*

8-3 Women in agriculture in Punjab Province

8-3-1 General profile of rural Punjab Province

The population of Punjab Province is over 94.4 million people which covers appropriately 55.6% of the total population of Pakistan²⁷. The major ethnic group of Punjab Province is the Punjabi, and the languages/dialects of Punjabi, Urdu, and Saraiki are spoken by people. The Province consists of nine Tehsils, 36 Districts, and 4,015 Union Councils.

58% of Pakistan's GDP is contributed by Punjab Province. Due to the 2010 flooding, however, the economy of the Province was severely affected²⁸. The amount of loss in Punjab Province was Rs. 222.3 billion, which was the secondly largest and 26% of the total amount of loss by Pakistan²⁹. The estimated damage in the agriculture sector of Punjab was over Rs. 154 million, and 1.2 million people lost their source of livelihood, of which 57% were engaged in the agriculture sector³⁰.

According to the Census in 1998, around 70% of the total population of Punjab Province reside in rural areas. The head count poverty rate of Punjab Province varies by agricultural production area, including Rice-Wheat Punjab; Mixed Punjab; Cotton-Wheat Punjab; Low Intensity Punjab; and Barani Punjab, ranging from 5.5% of Barani Punjab and 25% of Low Intensity Punjab³¹. The rate of urban area ranges from 1.5% of Barani Punjab to 16.7% of Low Intensity Punjab whereas that of rural area ranges from 7.2% of Barani Punjab to 26.1% of Low Intensity Punjab³².

The average household size for Punjab Province is 6.14 persons, which is lower than 6.35 of Pakistan's average, and the average number of income-earners per household for Punjab Province is 1.94 persons, which is slightly over the average of Pakistan³³. The average household sizes of the target districts of Bahawalpur, Khanewal, Multan, and Muzaffargarh are 6.8 persons, 7.0 persons, 7.1 persons, and 7.3 persons, respectively, which are almost exclusively more than Punjab Province's average of 6.9 persons³⁴. The average dependency rate for rural Muzaffargarh, in particular, is 109.2, which is much higher than 92.2 of rural Punjab's average.

The average monthly income per household for Punjab Province is Rs. 33,962 in 2013-14, which is the highest among the four provinces³⁵. There is a difference of around Rs. 16,000 in the average monthly income per household between urban and rural Punjab. The distribution of the monthly income per household in rural Punjab comprises: 1) 25.11% wage/salary; 2) 20.56% cropping; 3) 15.08% animal husbandry; 4) 5.68% domestic

²⁷ UNDP. 2011. *Punjab Millennium Development Goals report 2011*. Islamabad: UNDP.

²⁸ *ibid.*

²⁹ *ibid.*

³⁰ *ibid.*

³¹ *ibid.*

³² *ibid.*

³³ Pakistan Bureau of Statistics. 2015. *HIES 2013-14*. Islamabad: PBS

³⁴ Population Census, 1998 cited in UNDP. 2011. *Punjab Millennium Development Goals Report 2011*. Islamabad: UNDP.

³⁵ PBS. 2015. *HIES 2013-14*. Islamabad: PBS.

remittance; and 5) 5.74% international remittance³⁶.

In Pakistan, 61% of female-headed households live in rural areas³⁷. In 2000-01, 54% of the total households were headed by women in KP and 41% in Punjab while in 2004-05, the figure was 50% in Punjab and 49% in KP³⁸. In Pakistan, the poverty ratio is not necessarily higher among female-headed households than among male-headed households. However, the scores of poverty gap and poverty severity at the household level are much higher among female-headed households in rural areas (5.41 for poverty gap and 1.65 for poverty severity) than among male-headed households in all areas³⁹. According to Khalid and Akhtar, the variables of age, literacy, engagement in wage-labor/entrepreneurship, having remittance, dependency ratio, and living in rural area are statistical efficient to determine whether or not those women headed household live under the poverty line⁴⁰.

8-3-2 General profile of agriculture in Punjab Province

In Pakistan, the agriculture sector makes up 24% of the GDP, of which 17% is contributed by Punjab Province⁴¹. 75.5% of Pakistan's total wheat production, 70.2% of the total rice production, 68.5% of the total cotton production, 67.8% of the total sugar cane production, and 79.8% of the total maize production are produced in Punjab Province⁴². In addition, vegetables and fruits, such as mangoes, dates, citrus, etc., are produced⁴³. Rural households in South Punjab consist mainly of farm- and non-farm households. Farm households include large-size landowners, farmers, and sharecroppers, as well as landless daily-based laborers and labor families who provide their landowners with labor services in exchange of free residence, free food, wages, etc.

8-3-3 Men's and women's role in agriculture and livestock management in Punjab Province

Women in rural areas of Punjab Province take responsibility for not only reproductive work, such as household chores and child care, but also productive work, such as agriculture and livestock management⁴⁴. They spend 12 to 15 hours per day for such reproductive and productive work, especially for taking care of livestock⁴⁵. Despite their hard work, women's work is generally unpaid. Commercial-based agriculture is exclusively dominated by men and the incomes earned through the sales of dairy products and animals in the market are

³⁶ *ibid.*

³⁷ <http://pide.org.pk/pdf/Working%20Paper/WorkingPaper-80.pdf> (latest access on March 24, 2016) (pp.7)

³⁸ *ibid.*

³⁹ *ibid.*

⁴⁰ Khalid & Akhtar. 2011. "Poverty Dynamics of Female-headed Households in Pakistan: Evidence from PIHS 2000-01 and PSLM 2004-05, PIDE Working Papers 2011-80". (pp. 10)

⁴¹ FAO. 2015. *Women in Agriculture in Pakistan*. Islamabad: FAO.

⁴² *ibid.*

⁴³ *ibid.*

⁴⁴ FAO. 2015. *Women in Agriculture in Pakistan*. Islamabad: FAO.

⁴⁵ *ibid.*

usually controlled by men⁴⁶. Furthermore, few women are involved in decision-making processes for how to manage agriculture and animal husbandry at the household level⁴⁷.

What kind of works women do for cropping and livestock management and how much they are involved in cropping and livestock management may depend on landownership, land size, and the type of agriculture run by each household. Girls and women from landowning households do not need to do any agriculture and livestock management work or even household chores, except cooking. This is because landowning households tend to hire labor families, including girls and women, who take responsibility for both productive and reproductive work for the landowning households. On the other hand, women from landless households and labor families have to take dual or triple roles, including agricultural labor work, domestic labor work, and household chores.

In South Punjab, women from landless or small-land-size households often engage in daily-based agricultural labor work. In vegetable cultivation, women workers take more responsibility to hoe and prepare the land while in wheat and cotton production, they are hired mainly to pick cotton/harvest wheat⁴⁸. Women workers are also involved in picking, cleaning, packing, etc. for fruit production⁴⁹. According to the author's interviewing with women in rural Muzaffargarh, women can get only Rs. 100 to Rs. 150 per day (around 6 hours of labor), for those daily based agricultural labor work, which is almost a half of the wage given to men.

In the households of small-scale farmers, men often take main roles in water management with irrigation, machine operation, and chemical fertilizer & pesticide practice. Women from those households are engaged in other labor-intensive work, such as seed preparation, sowing seeds, transplanting, weeding, cultivation, post-cultivation treatment, etc⁵⁰. Since mechanization is advanced more in wheat production than in rice production, women tend to be more involved in rice production than in wheat production. In the production of sugar cane, however, men and women are engaged in land preparation, weeding, harvesting, peeling, etc. together⁵¹.

According to Gender Management Information System (GMIS) developed by PCSW, agricultural population of Punjab Province comprises men and women almost equally. However, the ratio of women engaged in wheat and rice production is much less than that of men. On the contrary, the ratio of women engaged in livestock management is equal to that of men. While men take responsibility for buying feed and selling dairy products in the market, women take responsibility for feeding/ giving water, taking care of animals, collecting manure, cleaning sheds, milking, making butter, etc.⁵²

⁴⁶ *ibid.*

⁴⁷ *ibid.*

⁴⁸ *ibid.*

⁴⁹ *ibid.*

⁵⁰ *ibid.*

⁵¹ *ibid.*

⁵² *ibid.*

8-3-4 Access to/control over resources and power over decision-making

Based on the power relationship between men and women embedded in a society, gendered division of labor/role tends to be determined, as well as what resources men and women are able to have access. In accordance with the power relationship and gendered division of labor/role, who makes a decision can be also determined. In traditional and patriarchal society, due to unequal gender relations, agricultural land is possessed mainly by men, and therefore, men are recognized as farmers, but not women. Due to the practice of *purdah*, women are not allowed to go to the market. In other words, only men can have access to the market, which implies that men have access to agricultural inputs, such as seeds, chemical fertilizer, and pesticide and access to and control over the income earned by selling agricultural products, dairy products, and animals in the market. Thus, how to manage farming and animal husbandry tends to be decided only by men, and women end up with providing their labor without participating in decision-making processes and without getting paid.

Based on gender division of labor/roles, men tend to exclusively have access to agricultural machines, irrigation, and agricultural inputs. Due to their having more land ownership, men can have more access to loan and credit services from commercial and public banks while women have access only to community-based saving and micro-credit activities if they have any at all. In animal husbandry, men usually dominate control of cows and buffalos and decision-making power over buying and selling those animals. Women are also involved in buying sheep, goats, and hens through available savings or micro-credit. However, they might need to get permission from their male family members and may not be allowed to make decisions on their own. The access to the market limited to men might contribute to the systematic exclusion of women from control of the income earned in the market and decision-making on cropping and animal husbandry.

The gender division of labor/role and unequal gender relations have been reinforced and perpetuated in such a patriarchal society of South Punjab, particularly through the system of extended family. In an extended family, all the power is often concentrated in the hands of an elder man who is the head of a household. Not only women, but also other male family members are not given decision-making power over critical issues at the household level. On the other hand, in the case of a nuclear family, there might be more possibility to break through such a patriarchal power structure within a household. Women from a nuclear family just need to acquire a bargaining power to well convince their husbands, fathers-in-law, and mothers-in-law. Depending on the way of interventions by donors/NGOs, those women can get empowered enough to get more decision-making power over the management of agriculture and animal husbandry and how to use household income. In the case of women widows, they already have decision-making power and autonomy within a household, but how they can increase their income with their limited resources and mobility might be a big challenge for them.

The Dairy and Rural Development Foundation (DRDF), funded by United States Agency for International Development (USAID), has trained qualified (educational attainment of the 8th grade or more) women from their target villages as Women Livestock Extension Workers (WLEWs) at the village level. Based on the author's interview with some WLEWs in Bahawalpur, some widows were also involved in this training program. According to one widow with 7 children, she separated from her husband who used to not work for a living and totally depended on the income she earned by doing daily-based agricultural work, seven years ago. She used to earn only around Rs. 3,000 per month, but now she earns Rs. 7,000 to 8,000 by providing male and female

villagers with basic medical treatment for their animals and other services as a WLEW. Through USAID/DRDF's intervention, she was able to increase her income and more importantly gained self-confidence through interaction with villagers and more free mobility through daily-based activities as a WLEW. On the other hand, another WLEW, whose husband also works as a Man Livestock Extension Worker (MLEW), takes a leadership among 10 WLEWs belonging to the same Union Council. She earns Rs. 25,000 per month by selling feed to villagers in addition to basic medical treatment and other services. In her case, however, she has not necessarily gained her bargaining power over the income earned by her and her husband. She spends almost her all income for food, education and clothes for their children, etc. while her husbands saved all his income and bought the land and built their house under only his name.

The USAID/DRDF project contributed to the women who were relatively highly educated, but had no decent jobs at the village level by training them as WLEWs and giving them an opportunity to make sufficient income, on the one hand. The project has also made up for a lack of public extension services, especially by women extension workers, at the village level by providing villagers with private women extension workers. However, the USAID/DRDF project focused only on women's daily-based needs of improving their livelihoods, namely gender practical needs. The project did not take any action for meeting gender strategic needs, that is, women's control over resources and income and decision-making power, on the other hand.

8-3-5 Constraints of women from participation and possible measures

The most critical constraint faced by women participants in any projects related to agriculture and animal husbandry might be the practice of *purdah* and women's limited mobility. However, women's limited mobility is caused by a lack of/limited public transportation system, rather than due to *purdah*, in rural areas in particular. The relatively low literacy rate of rural women, especially in the target districts of Bahawalpur, Khanewal, Multan, and Muzaffargarh, can be another constraint to prevent rural women, in particular, to actively participate in training programs and decision-making processes. In order to reduce such constraints, it is necessary to spend sufficient time for community mobilization and gender sensitization from the initial stage of a new project so that rural women get motivated to learn new skills/technology and take a decision-making role in better agriculture and livestock management.

Drawing from a provider's side, the most critical problem is that both Agriculture Extension Department and Livestock Department at the provincial and district levels lack human resources of women experts, such as agriculture officers, field assistants, veterinary officers, and veterinary assistants. Because of *purdah*, women farmers in South Punjab, as other parts of Pakistan, are not able to take any training instructed by men, but women. It is not appropriate to exclude women farmers only because women instructors are not available from the government. Instead, it is better to consider the possibility of training private women extension workers at the village level as the USAID/DRDF did in their project.

In order to increase the number of women extension workers in the public sector, it is essential for the government to ensure the safety and convenience of women extension workers in moving to the field. According to several female veterinary officers in Muzaffargarh, the most critical problem faced by them is a lack of efficient public transportation system when they need to visit a village. The District Livestock Department,

Muzaffargarh introduced the use of a mobile animal dispensary, by which women veterinary officers have no problem with their mobility. Therefore, if the Department can afford to buy more mobile animal dispensaries, there might be more women who apply for the positions of veterinary officers and veterinary assistants. It is important to suggest the Department to make gender-friendly working environment for increasing the number of women extension workers.

Chapter 9 Cooperation of Supporting Agencies in Agriculture, Livestock and Community Development Sectors

9-1 Projects and activities by other donors in agriculture, livestock, and community development sectors

9-1-1 USAID

USAID is one of the major donors in Punjab Province, and the historic enhanced partnership with Pakistan Act of 2009 launched longer-term development programs in five sectors: energy, economic growth including agriculture, stabilization, health and education, which are prioritized for both the United States and Pakistan with crosscutting themes of civic participation, accountability and women's empowerment.

USAID-DRDF Dairy project aims to foster sustainable increase in best dairy practices, breed improvement; availability of timely extension services and promotion of the livestock business in rural communities in Multan, Khanewal, Lodhran, Bahawalpur and Vehari in South Punjab from 2011 for six years including extension. Nestlé funded the project for 20%, which shows that the project involves the private sector. As of May 2016, the project has trained 37,746 dairy farmers, 6,392 female livestock extension workers, 2,230 AI technicians, upgraded 500 farm managers as well as commercial farmers and improved 72 model farms. As a result of the activities, milk production increased for 17% and female livestock extension workers could earn approximately 3,000 PKP per month and 9,139 PKP for AI technicians in the targeted areas. USAID-DRDF faced two major challenges, namely obstacles for females to receive the livestock extension training in the community and security issues. At the first stage of the project, USAID-DRDF faced difficulty to obtain community acceptance for the female training due to social norms. However, the project acquired community acceptance gradually as the project held a large number of meetings with community leaders and targeted families for the understanding and also the project showed the benefit to the community. It is observed in the interviews with the beneficiaries that the trained female livestock extension workers were empowered in terms of gaining confidence and economic improvement. As for the security issues, USAID tried to appeal DRDF as a local partner and Nestlé which is trusted by the community to promote the project acceptance.

In addition, USAID implemented the agriculture policy project in Punjab, KP and Sind provinces to enhance capacity building in agriculture and food security sector from 2011 to 2015, and the agriculture recovery project in Punjab, KP and Baluchistan provinces from 2010 to 2012 after the flooding in 2010. Moreover, USAID concluded a MOU for the Punjab Enabling Environment Project (PEEP) to enhance agribusiness in Punjab in 2016. USAID also funded PRSP in the sector of agriculture and livestock in Punjab Province.

9-1-2 IFAD

IFAD (The International Fund for Agricultural Development) is one of the major donors which implements projects in South Punjab. IFAD aims to support a sustained impact on rural poverty reduction in Pakistan by targeting small-scale farmers, landless farmers and women-headed households on the emphasis of gender equality and empowerment of women in Pakistan. IFAD pursues the important agenda of innovation, policy dialogue and knowledge management.

IFAD implements the Southern Punjab Poverty Alleviation Project (SPPAP) from 2012 to 2016 in Bahawalpur,

Bahawalnagar, Rajanpur and Muzaffargarh. The Punjab Government funded 20% of the project. NRSP and IRM (Institute of Rural Management) are implementation partners for the project. The project aims to enhance livelihood and develop agriculture and livestock through asset creations, vocational entrepreneur training, community physical infrastructures, productivity enhancement initiatives for agriculture, and training for women in livestock production. As an impact of the project, the project increased female participants for the agriculture, livestock and livelihood by empowering women. Moreover, approximately 50% of the beneficiaries who received vocational and business training established their own businesses. IFAD had challenges to promote the perspective of participation and cost sharing for the project to the targeted community people at the beginning of the project, since the community people are used to receiving free aid from donors and NGOs after the flooding in 2010. It was necessary for IFAD to make efforts to promote the concept.

9-1-3 Other donors

FAO (Food and Agriculture Organization of the United Nations) implemented Progressive Control of Foot and Mouth Disease (FMD) in Pakistan funded by USAID in Cholistan Desert in South Punjab in 2014. Some 7,500 heads of cattle in 69 communities of Cholistan Desert received vaccinations of FMD and information on the disease and its prevention by coordination with Cholistan Development Authority. In addition, FAO funded PRSP for the emergency project in the sector of agriculture and livestock in South Punjab after the flood in 2010. DFID (Department of International Development) funded a British NGO CAB (Centre for Agriculture and Biosciences International) in the sector of agriculture in Punjab Province. Asian Development Bank (ADB) worked for the sector of irrigation and implemented the Punjab Irrigated Agriculture Development Sector Project from 2005 to 2006 in Punjab. The World Bank has funded Pakistan Poverty Alleviation Fund Project in Punjab since 2009 for the sector of community development. EU (European Union) funded PRSP and other NGOs for the sector of agriculture after the flood in 2010.

9-2 Projects and activities by NGOs in agriculture, livestock, and community development sectors

9-2-1 Local NGOs

(1) NRSP

NRSP is one of the major local NGOs, which work for community development that includes agriculture, livestock, infrastructures, vocational trainings, micro finance, environment and natural resource management and gender through forming community organizations. NRSP currently works in Multan, Bahawalpur and Muzaffargarh in South Punjab. NRSP implements the project of Rural Women Economic Empowerment through Enhanced Participation in South Punjab's Dairy Sector in Muzaffargarh, Layyah, Vehari districts from 2015 to 2018. NRSP has been providing the micro finance loans for the sector of agriculture, livestock and business through Micro Finance & Enterprise Development Program (MEDP) in Multan and Bahawalpur. NRSP implements the project of Southern Punjab Poverty Alleviation Project (SPPAP) of IFAD as an implementation partner in South Punjab including Bahawalpur. NRSP faces major challenges in the sustainability of community organizations by the community after forming the COs.

(2) PRSP

PRSP is also one of the major local NGOs that works for the agriculture, livestock and community development in Punjab through forming community organizations as well as providing micro finance. PRSP conducts projects in Khanewal and Muzaffargarh in South Punjab. PRSP implemented the EU Food Facility Project funded by EU in the sector of agriculture, food security as well as infrastructure in Multan and Sahiwal Districts from 2009 to 2010. NRSP commenced the Social Mobilization Project funded by Pakistan Poverty Alleviation Fund to form community organizations by making the link with concerned authorities in Muzaffargarh and Layyah in 2008. Furthermore, PRSP conducted the distribution of canola seed and fertilizers in flood affected areas project funded by FAO and distributed canola seeds and fertilizers to 7,500 households after the flood in 2010. Moreover, PRSP conducted the emergency livelihood assistance to support flood affected vulnerable farmers project from 2010 to 2011 and the emergency relief and early recovery project "Bahaal" project funded by USAID in the same years in Muzaffargarh district. In the same manner of NRSP, PRSP faces a challenge of sustainability of formed community organizations by PRSP. PRSP aims for formed community organizations to function by themselves after 5 to 6 months. However, it is difficult for NRSP to sufficiently conduct follow-up and monitoring to the formed community organizations due to the shortage of staff.

(3) Other local NGOs

Agribusiness Support Fund (ASF), established with the support of ADB (Asian Development Bank), implemented the Agribusiness Project to expand value chain as well as the sales of horticulture and livestock from 2011 to 2014 in Punjab. On the one hand, Awaz Foundation implemented the Agricultural & Rural Income Diversification (ARID) to diversify income through the development of agriculture, food and security on the emphasis of securing women's economic empowerment from 2008 to 2017 in South Punjab.

9-2-2 International NGOs

CABI implemented a model for developing ICT based services for agriculture extension project funded by DFID to improve crop productivity through agriculture extension from 2010 to 2013 in Punjab Province including Multan, Khanewal, Bahawalpur and Muzaffargarh. According to the District Officer Agriculture (EXT) in Multan, Plant Clinics supported by CABI which provided consultation desks related to agriculture to farmers in markets and roads where farmers can easily access and the District Officer Agriculture (EXT) would like to continue the Plant Clinics as they can afford by themselves with less cost and it has positive impacts in terms of better access by farmers and improvement of farmers' agricultural knowledge.

On the one hand, WWF (World Wildlife Fund) has implemented the Pakistan Sustainable Cotton Initiative project funded by IKEA to achieve complete compliance to Better Cotton Initiative (BCI) production principles and criteria to improve sustainability of cotton production, resulting in substantial benefits for people, the environment and the cotton sector since 2005 in Bahawalpur, Lodhran, Rahim Yar Khan and Toba Tek Singh. In 2013, it is reported that the project imparted a 13% economic profit effect by involving 26,300 small-scale farm households and 620 of large-scale farmers in the four districts.

Chapter 10 Strategies for Technical Cooperation

10-1 Challenges in the surveyed districts

10-1-1 Agriculture sector

(1) Characteristics of farming in the survey areas

The survey areas can be categorized as shown in Table 10-1 based on vegetation and access to water.

Table 10-1. Categorization of the survey areas based on vegetation and the access to water

		Agro ecological zone	Areas in the survey areas	Availability of irrigation	Availability of Tube well
Cholistan Desert	Greater Cholistan	Arid area	Western part of Bahawalpur	No	No
	Lessor Cholistan	Semi-arid area	Western part of Bahawalpur	No	Partly yes
Thall desert		Semi-arid area	Part of Muzaffargarh	Partly yes	Yes
Other (irrigated area)		Irrigated area	Other areas	Yes	Yes

Source: JICA Survey Team

(2) Relation between the scale of farms and income of household

Farmers who have more than 1 to 2 hectares of farm in the irrigated areas generally cultivate some cash crop such as cotton, sugarcane, and mango and usually have stable income. However, many of the marginal scale farmers in irrigated areas and small farmers in non-irrigated areas do not have capacity to cultivate cash crops. As a result, they do not have enough income and tend to depend on labor work for their household income.

(3) Support of the Department of Agriculture

The targets of most of the supports by the Department are the farmers who have at least 1 acre of farmland. The small farmers tend not to have enough supports from the Department, and there is actually no model to improve the livelihood of small farmers.

Also, the supports from the Department are mostly extended to the production areas of agriculture. There is much room to enhance the supports on other areas such as processing and marketing.

10-1-2 Livestock sector

The challenges for the livestock sector in KPK are as follows.

(1) Livestock farmers

The farmers seek for growth of livestock productivity most, for which improvement of feed, increase of reproductive rate (breeding efficiency) and provision for animal health are necessary.

- Increase of the conception rate of buffaloes
- Securement of feed for the livestock owners without land

- Opportunities for training
- Securement of quality water even in a part of irrigated areas

(2) L&DD

The challenges for L&DD are expertly summarized in the livestock policy papers.

- There are leftover areas for carpet vaccination and deworming.
- The vaccine doses produced at VRI do not meet the demand of the Province.
- The actual conditions of the private practitioners are obscure though a number of farmers are relying on them.
- Extension activities for farmers are not sufficient and well managed.
- The disease diagnosis at the district level should be improved.
- The quantity of the diagnostic reagents produced at VRI is not sufficient.
- Training opportunities for VOs and VAs are few.
- Few farmers engage in fattening of male cattle.

10-2 Strategies for technical cooperation

10-2-1 Agriculture sector

The main target of the support should be small and subsistence farmers who do not have enough income by agriculture and do not get enough support from the Department of Agriculture. The model to improve the livelihood of small farmers needs to be developed. Horticulture products can be appropriate for that model as the value addition per unit of land is high; one of the candidate horticulture products would be date trees.

Indeed, many of the farmers in Thall Desert areas consider dates as profitable cash crop and have planted many date trees. However, many of the date farmers do not get enough income out of date cultivation due to the lack of proper cultivation, processing, and marketing skills. As high quality dates are sold at high prices in the domestic and international markets, there is ample room for farmers to increase sales value by improving the quality of dates and by introducing new popular varieties. Also, there are nurseries of popular date varieties of foreign origin in Horticulture Research Station. If these varieties of dates are extended to small farmers, its economic impact could be significant. As the lifetime of date trees is about 100 years, the plantation of date trees can also function as the assets creation activities.

However, the research and extension capacities of Horticulture Research Station are not high enough to generate significant social impact. For example, the station staffs do not have the skills of tissue culture and thus they have to import the seedlings or suckers from foreign countries if they are to introduce new varieties of foreign origin. These skills in the Horticulture Research Station need to be improved.

10-2-2 Livestock sector

Technical cooperation activities for the prospective increase of farmers' income in terms of the said challenges are discussed below:

(1) Training for VOs and VAs

Postgraduate and refresher training programs should be provided for the VOs and VAs for development and update of their knowledge and skills. Any workshop discussing their challenges and countermeasures in the field could be helpful.

(2) Provision of the opportunities for training of farmers

Farmer Field School is considered to be appropriate for the venue that farmers learn as a number of good practices can be found in Punjab and readily applied to many other farms.

(3) Involvement of private practitioners

First of all, the actual conditions of the private practitioners should be investigated, and subsequently, a system for upgrading of their skills is expected to be introduced in order to increase the overall animal health services.

(4) Provision for animal health issues

The diagnosis at the district level is still very basic and should be considered to introduce more advanced techniques such as ELISA for serology and PCR for molecular biology in order to meet the farmers' needs. In addition, effective utilization of the mobile laboratory at each district L&DD ought to be studied.

(5) Technical support for VRI on vaccine and diagnostic reagent production

Technical support for VRI on upscale of vaccine and diagnostic reagent production is expected.

10-3 Remarks for implementation of cooperation projects

10-3-1 Agriculture sector

- (1) The number of staffs in the Department of Agriculture is not so large. The workloads of the Department staffs need to be considered for the implementation of any project.
- (2) The processing and marketing skills of the staffs of the Department of Agriculture are not high enough to train farmers. The capacity building of the Department staffs needs to be achieved in the beginning of the project.

10-3-2 Livestock sector

- (1) Appropriate ideas are necessary to outreach rural women since female VOs and VAs are few.
- (2) The activities should be in line with the challenges stipulated in "The Policy Papers".
- (3) The cooperation is expected to make synergic effects along with the provincial development projects that the L&DD is implementing.
- (4) The actual conditions of the private veterinary practitioners should be illustrated so that they could play certain roles for livestock farmers.
- (5) "Feed", "breeding" and "animal health" are the keywords for improvement of small-scale farmers' livelihood.
- (6) Vaccination and diagnosis are important for control of the problematic diseases in Punjab as shown in Table 10-2.

Table 10-2. Problematic diseases in Punjab and their feasible countermeasures.

Prevalent Infectious Diseases	Vaccine Availability	Drugs for treatment	Provision
Foot and mouth disease	Yes	No	Carpet Vaccination
Peste des petits ruminants	Yes	No	Vaccination
Hemorrhagic septicemia	Yes	Antibiotics	Carpet Vaccination
Black quarter	Yes	Antibiotics	Vaccination
Enterotoxemia	Yes	No	Carpet Vaccination
Pox (sheep and goats)	Yes	No	Vaccination
Contagious caprine pleuropneumonia	Yes	No	Vaccination
Anthrax	Yes	No	Vaccination
Brucellosis	No *	No	Culling
Hemoparasites	No	Yes	Diagnosis +Treatment
Stomach worms	No	Deworming drugs	Diagnosis +Treatment

* Vaccine for heifers is available from the private sector.

10-3-3 Gender

From a gender perspective, the most expected impact of a new project that women no longer passively participate in the project and only receive services and materials as beneficiaries. Rather, the project should aim to change women from passive beneficiaries to main actors through the project's interventions. Women participants are expected to get empowered to make decisions by themselves, based on which they can effectively utilize what they gained from the project, such as information, knowledge, and skills/technology, for their better livelihoods.

The patriarchal rural society of the target districts in South Punjab has prevented women from taking a decision-making role as leaders or main actors in agriculture and animal husbandry. In order to deliver the expected gender impact within a limited period, targeting might be one of the most effective strategies. In other word, targeting is an entry point to identify the sector and the women that the project can more easily address/approach to.

The sector of livestock management is one of the most possible target sectors from a gender perspective. At present, women are already involved in livestock management not passively, but actively. They play a main role in this sector, which is well recognized even by men and the government. Some women even have control over the animals of which they take care, as well as the income they earn from dairy products. There might be less constraints/barriers for the project to take away the gender biases of villagers through community mobilization and gender sensitization and to expand women's roles/power to a decision-making role/power.

The Livestock Department has already introduced services by mobile animal dispensaries in some districts, still limited in number. If more mobile animal dispensaries are available, more women might apply to the positions of veterinary officers and veterinary assistants in the public sector, which will directly benefit women farmers who have no access to extension services at present. The project should suggest the government to make the

gender-friendly working environment where women extension workers can safely and conveniently move around to provide their extension services to women farmers.

There is a diversity within women. There are women widows who have their own decision-making power and autonomy within their households, but they lack resources and capital to diversify sources of income and improve their livelihoods. On the other hand, women from extended families have no decision-making power. It will be very tough and take a long time to change the power relationships and gender relations embedded deeply within the extended family system of the patriarch society. In that sense, it might be more efficient and effective to first target women widows and secondly women from nuclear families who have more freedom than women from extended families to negotiate with their male family members for more decision-making power.

10-3-4 Community organization and extension

(1) Points of attention in Community Organization/Diffusion by the District Officer Agriculture (EXT)

The challenges for the District Officer Agriculture (EXT) in Multan, Khanewal, Bahawalpur and Muzaffargarh are as follows.

a) Improvement of extension outreach

It is suggested that the District Officer Agriculture (EXT) can utilize the resources and network of local NGOs such as NRSP and PRSP to expand extension services to farmers. It is important for the District Officer Agriculture (EXT) and NGOs to build a relationship in a sustainable manner since the District Officer Agriculture (EXT) is not coordinating with any local NGOs.

b) Improvement of extension outreach to female farmers

The extension service by female extension staff to female farmers is limited due to the shortage of female extension staff of the District Officer Agriculture (EXT). The District Officer Agriculture (EXT) can utilize the resources and network of local NGOs such as NRSP and PRSP to complement female extension staff. It is crucial to obtain acceptance from targeted communities though having a process of dialogue with communities by considering social norms.

c) Securement of the budget and resources for FFS (Field Farmers School)

It is necessary to allocate the budget for FFS by the Pakistani government in a sustainable manner.

(2) Points of attention in Community Organization/Diffusion by the District L&DD

The challenges for the District L&DD in Multan, Khanewal, Bahawalpur and Muzaffargarh are as follows.

a) Improvement of extension outreach

It is recommended that the District L&DD can utilize the resources and networks of local NGOs such as NRSP and PRSP to expand extension service to farmers. It is important for the District L&DD and NGOs to build relationships in a sustainable manner. In addition to this, livestock extension workers from the communities at village level can be trained as focal persons by the District L&DD with support from the local NGOs and this will result in complementing the coverage of extension of the District L&DD.

b) Improvement of extension outreach to female farmers

The extension service by female extension staff to female farmers is limited due to the shortage of female extension staff of the District L&DD. Female focal persons as livestock extension workers from the communities at village level can be trained by the District L&DD with support from the local NGOs to complement the coverage of extension service by the District L&DD to female farmers. It is important to emphasize the process of obtaining acceptance from targeted communities by considering social norms.

c) Securement of transportation for female extension staff

It is significant to note that the District L&DD should secure transportation for female extension staff by considering social norms in a sustainable manner since they use public transportation for the field activities.

d) Reinforcement of the trainings and system within the provincial L&DD.

It is essential to note that the Provincial L&DD should allocate the budget for the training of the extension staff and build the training system within the Provincial L&DD.