USAID Firms Project

Baseline Survey of Peach and Potato Growers in Swat ((2012)

October 2012

This publication was produced for review by the United States Agency for International Development (USAID). It was prepared by APEX Consulting Pakistan under an assignment commissioned by the USAID Firms Project.

USAID FIRMS PROJECT

Baseline Survey of Peach and Potato Growers in Swat (2012)

DISCLAIMER
The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Data Page

Contract Number:	GBTI II Task Order No. EEM-4-07-07-00008-00
Contractor Name:	Chemonics International, Inc.
Name of the Component:	Monitoring and Evaluation
USAID Technical Office:	Office of the Economic Growth and Agriculture; USAID Pakistan
Date of Report:	July 23, 2012
Date of Revised Report:	October 19, 2012
Document Title:	Baseline Survey of Peach and Potato Growers in Swat (2012)
Author's Name:	Dr. Iqbal, Muhammad & Dr. Hijazi, L.A. (APEX Consulting Pakistan)
Study Design and Methodology:	Ahmed, Shakaib. Nasir, Rida. Tahir, Shahzad.& Zaighum, B. Ishaq. (USAID Firms Project)
Photo Credits:	Hassan Tabbasum (APEX Consulting Pakistan)
Editing:	Nasir, Rida & Tahir, Shahzad (USAID Firms Project)
SOW Title and Work Plan & Action ID:	Work Plan Level 11350, Action 6073, SOW 1883
Project Area:	Swat Region, Khyber Pakhtunkhwa, Pakistan
Key Words:	Peach Sector, Potato Sector, Swat, Khyber Pakhtunkhwa s>

Abstract

The peach and potatoes sectors create employment opportunities for a large number of people in the Swat distrct of the Khyber Pakhtunkhwa. Despite this, a significant amount of produce is wasted due to pre- and post-harvest losses. Additionally, the growth of these sectors is limited due to a lack of access to inputs supplies, market information, market linkages, and credit facilities as well as an untrained work force, poor management practices, inability to meet product standards (quality, consistency, hygiene, etc.), and non-availability of pulping units to utilize B, C, and D grade fruit for pulp processing and value additions. Increasing the economic value of these sectors begins with minimizing losses during pre- and post-harvest, increasing yields, and diversifying end market opportunities for producers. The USAID Firms Project has devised peach and potato sector development projects to improve production and increase sales revenue for the identified horticulture value chains in vulnerable areas of Pakistan and by doing so, is supporting the rehabilitation and recapitalization small and medium enterprises (SMEs) affected by the conflict and the 2010 floods.

The purpose of this study was to establish base lines of the peach and potato growers to assess farm management, production, and marketing practices with an additional focus on access to credit services/facilities, technical advice and training facilities, input supplies, market information, and market linkages. The findings of this survey informed USAID Firms project develop appropriate response strategies for better production and sales revenue. The current present the fidnigns of this baseline surey. The first section presents the findings of the potato survey followed by the findings of the peach survey.

ACRONYMS

APEX	APEX Consulting Pakistan (Consultants)
CSPro	Census and Survey Processing System
Project	USAID Firms Project
GOP	Government of Pakistan
HH	Household
IP	Implementing Partner
KP	Khyber Pakhtunkhwa
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
SMEs	Small and Medium Enterprises
SOW	Scope of Work
SPSS	Statistical Package for Social Science
ToR	Terms of Reference
UC	Union Council
USAID	United States Agency for International Development
USD	United States Dollar

Table of Contents

TABLE OF CONTENTS II
EXECUTIVE SUMMARY XII
1. INTRODUCTION 1
1.1. INTRODUCTION AND BACKGROUND 1
1.2. DISTRICT SWAT 1
1.3. USAID FIRMS PROJECT BRIEF 1
1.4. OBJECTIVES OF BASELINE SURVEY 2
1.5. SCOPE OF WORK 2
2. BASELINE SURVEY METHODOLOGY 3
2.1. SAMPLE SIZE CALCULATION 3
2.1.1. For Potato Growers 3
2.1.2. For Peach Growers 3
2.2. SAMPLING STRATEGY 4
2.2.1. Data Collection of Potato Farm 4
2.2.2. Data Collection of Peach Farm 5
2.3. RESPONDENTS 5
2.4. SURVEY INSTRUMENT 5
2.5. SELECTION OF FIELD TEAMS 5
2.5.1. Field Teams Composition 6
2.5.2. Survey Training for the Orientation of Tools 6
2.5.3. Data Editing, Entry and Cleaning 7
2.5.4. Data Analysis 7
2.5.5. Informed Consent 7
2.5.6. Quality Control 7
3. POTATO SURVEY FINDINGS 9
3.1. BASIC INFORMATION ON POTATO FARMERS 9
3.1.1. Types of Farm Ownership, Management and Sources of Irrigation 9
3.1.2. Distance and Time Taken by Foot from Farm to Main Road 10
3.1.3. Landholding Size of Potato Farms 10
3.1.4. Number of Farmers with Different Cultivars, their Acreage and Yield 11
3.1.5. Major PotatoSowing Tehsils in Swat District 12
3.1.6. Total Cost of Production 13
3.2. FARM EMPLOYMENT DETAILS 14
3.2.1. Cost of Labor Employed in Potato Farms 15
3.2.2. Details of Working Days of Labor in PotatoFarms 15
3.2.3. Full Time Equivalent (FTE) for All Labor Categories 16
3.3. SALE AND INCOME VALUES OF POTATO GROWERS 17
3.3.1. Channels of Marketing Adoptedby Potato Farmers 19
3.3.2. Usage of Technology by Potato Farmers 20

3.3.3. Difficulties Faced by Farmers in Production of Quality Potato 21
3.4. FINANCING SOURCES OF POTATO FARMERS 22
3.4.1. Financial Requirements of Potato Farmers 22
3.5. POTATO FARMERS DEGREE OF INFORMATION AND SOURCES OF INFORMATION 23
3.5.1. Types of Training Received by Potato Farmers 24
3.5.2. Scale of Training Utilization 25
3.5.3. Improved Practices AdoptedAfter Training Received 25
3.5.4. Future TrainingNeeds of Potato Farmers 26
3.5.5. Maintenance of Farm Records by Potato Growers 27
3.5.6. Potato Farmers Interest in New High Yielding Cultivars 29
3.5.7. Reasons Given by Growers for Sowing New Cultivars 29
4. PEACH SURVEY FINDINGS 31
4.1. BASIC INFORMATION OF PEACHORCHARD 31
4.1.1. Types of Farm Ownership, Management and Source of Irrigation 31
4.1.2. Distance and Time Taken by Foot from Farm to Main Road 31
4.1.3. Landholding Size of Peach Orchards 32
4.1.4. Number of Farmers with Different Cultivars, their Acreage and Trees 32
4.1.5. Major Peach Growing Tehsils in Swat District 33
4.1.6. Total Cost of Production 34
4.2. FARM EMPLOYMENT DETAILS 34
4.2.1. Cost of Labor Employed in Peach Orchards 35
4.2.2. Details of Working Days of Labor in Peach Orchards 36
4.2.3. Full Time Equivalent (FTE) for All Labor Categories 36
4.3. SALE AND INCOME VALUES OF PEACH GROWERS 37
4.3.1. Channels of Marketing Adopted by Peach Producers 39
4.3.2. Usage of Technology in Peach Production 40
4.3.3. Difficulties Faced by Peach Farmers in Production of Quality Peaches 41
4.4. FINANCING SOURCES OF PEACH FARMERS 41
4.4.1. Financial Requirements of Peach Farmers 42
4.5. PEACH ORCHARDERS DEGREE OF INFORMATION AND SOURCES OF INFORMATION 42
4.5.1. Types of Trainings Received by Peach Orcharders 43
4.5.2. Scale of Training Utilization 44
4.5.3. Improved Practices Adopted After Training Received 45
4.5.4. Future Training Needs of Peach Orcharders 46
5. CONCLUSIONS AND RECOMMENDATIONS 47
5.1. POTATO SURVEY CONCLUSIONS 47
5.2. RECOMMENDATIONS TO IMPROVE POTATO PRODUCTION IN DISTRICT SWAT 48
5.3. PEACH SURVEY CONCLUSIONS 48
5.4. RECOMMENDATIONS TO IMPROVEPEACH PRODUCTIONIN DISTRICT SWAT 50
6. APPENDICES 51
APPENDIX 1: SCOPE OF WORK AND DELIVERABLES 51
APPENDIX 2: POTATO QUESTIONNAIRE 57
APPENDIX 3: PEACH QUESTIONNAIRE 68

APPENDIX 4: REFERENCES 78

List of Tables

Table 1: Potato Farms Visited in Different Clusters 4
Table 2: Peach Farms Visited by Clusters 5
Table 3: Types of Farm Ownership, Management & Irrigation 9
Table 4: Distance and Time Required by Foot to Reach from Farm to the Main Road 10
Table 5: Farms' Classification by Area with No. of Farmers in Each Category 10
Table 6: Farmers with Different Potato Cultivars, Their Acreage & Production in 2010 11
Table 7: Farmers with Different Potato Cultivars, Their Acreage & Production in 2011 11
Table 8: Tehsil Wise Acreage & Production of Potato with No. of Farmers 12
Table 9: Total & Average per Acre Production and Marketing Cost of Potato 13
Table 10: Total & Average Per Acre Farm Employment Days in Different Labor Categories in 2010 14
Table 11: Total & Average per Acre Farm Employment Days in Different Labor Categories in 2011 14
Table 12: Total & Average per Acre Cost of Labor in Different Labor Categories in 2010 15
Table 13: Total & Average per Acre Cost of Labor in Different Labor Categories in 2011 15
Table 14: Different Labor Categories Employment Status on Potato Farms 16
Table 15: Employment Figures in Potato Farms in 2010 16
Table 16: Employment Figures in Potato Farms in 2011 17
Table 17: Potato Farmers' Status in Different Sales Categories in 2010 17
Table 18: Potato Farmers' Status in Different Income Categories in 2010 18
Table 19: Potato Farmers' Status in Different Sale Categories in 2011 18
Table 20: Potato Farmers' Status in Different Income Categories in 2011 19
Table 21: Potato Farmers Degree of Satisfaction with their Present Financial Arrangements, Their Willingness for Further Loans & Amount Requirements 22
Table 22: Types of Farm Ownership, Management & Irrigation 31
Table 23: Distance and Time Required by Foot to Reach from Farm to the Main Road 31
Table 24: Farms' Classification by Area with No. of Farmers in Each Category 32
Table 25: Farmers with Different Peach Cultivars, Their Acreage& No. of Trees in 2010 32
Table 26: Farmers with Different Peach Cultivars, their Acreage & No. of Trees in 2011 33
Table 27: Tehsil Wise Acreage & Production of Peach with No. of Farmers 33
Table 28: Total & Average per Acre Production and Marketing Cost of Peach 34
Table 29: Total & Average Per Acre Farm Employment Days in Different Labor Categories in 2010 35
Table 30: Total & Average per Acre Farm Employment Days in Different Labor Categories in 2011 35
Table 31: Total & Average per Acre Cost of Labor in Different Labor Categories in 2010 35
Table 32: Total & Average per Acre Cost of Labor in Different Labor Categories in 2011 36
Table 33: Different Labor Categories Employment Status on Peach Farms 36
Table 34: Employment Figures in Peach Farms in 2010 36
Table 35: Employment Figures in Peach Farms in 2011 37
Table 36: Peach Farmers' Status in Different Sales Categories in 2010 37
Table 37: Peach Farmers'Status in Different Income Categories in 2010 38
Table 38: Peach Farmer's Status in Different Sale Categories in 2011 38

Table 39: Peach Farmer's Status in Different Income Categories in 2011 39
Table 40:Peach Farmers Degree of Satisfaction with their Present Financial Arrangements, Their willingness for further Loans & Amount Requirements 42

List of Figures

Figure 1: Field Team Structure 6
Figure 2: Distribution of Mode of Selling/Marketing Farm Produce in 2011 19
Figure 3: Marketing Channel of Farm Produce 20
Figure 4: Distribution of Usage of Technology at Potato Farms 21
Figure 5: Difficulties Faced by Farmers in Production of Quality Potato 21
Figure 6: Distribution of Financing Sources of Potato Farmers 22
Figure 7: Sources of Information 23
Figure 8: Distribution of Training Received 24
Figure 9: Distribution of Training Utilization after Receiving Information/Trainings 25
Figure 10: Different Practices Used by Farmers after Adopting Good Farming Techniques 26
Figure 11: Distribution of Types of Training Needed 27
Figure 12: Distribution of Types of Farm Record Maintained 28
Figure 13: Farmers Interested in Growing New Potato Cultivars in percent 29
Figure 14: Distribution of Reasons for Growing New Potato Cultivar 29
Figure 15: Distribution of Mode of Selling/Marketing Orchard Produce in 2011 39
Figure 16: Marketing Channel of Peach 40
Figure 17: Distribution of Usage of Technology in Peach Orchards 40
Figure 18: Difficulties Faced by Farmers in Production of Quality Peaches 41
Figure 19: Distribution of Financing Source of Peach Farmers 42
Figure 20: Distribution of Sources of Information/Training 43
Figure 21: Distribution of Training Received 44
Figure 22: Distribution of Training Utilization after Receiving Information/Trainings 44
Figure 23: Different Practices Used by Farmers after Adopting Good Farming Techniques 45
Figure 24: Distribution of Types of Training Needed 46

CONVERSION TABLE

1 PKR	0.0117 USD	Average of April – September 2010
	0.0116 USD	Average of April – September 2011
1 Acre	2.0234 Jeribs	Afghan Jeribs System

GLOSSARY

Acre	Aunitfrequently used for land measurement
Dehkani	A crop sharing system of farming. Normally in Swat, crop distribution by ratio 75:25 to owner andlabor in case where one person provides inputs and other provide labor
District	The second tier of administrativedivision in Pakistan following the provinces
Intermediate	Equivalent to 12 years of education in Pakistan
Jerib	The jerib or djerib is a traditional unit of land measurement in Middle East and southwestern Asia. It is used to measure landholdings (real property) in much the way that an acreandhectare are
Peach Cultivars	Trees of No.5 (Peach Cultivar NJC 84), Trees of No.8 (Peach Cultivar Indian Blood), Trees of No.6 (Peach Cultivar Elberta), Trees of No.7 (Peach Cultivar Maria Delezia), Trees of No.4 (Peach Cultivar Carmon), Trees of early green Cultivar, Other Cultivars (i.e. Golden, Hartley, Sohani, Haljan)
Potato Cultivars	Roco, Raja, Diamont, Lady Rozetta, Sterna and Desiree
Union Council	It is the fourth tier of administrative division in Pakistan following the Tehsil/Taluka

EXECUTIVE SUMMARY

Introduction

The objective of the USAID Firms Project (the 'Project') is to stimulate growth in the Pakistani economy to root out causes of extremism. Swat is one suchregion that can become the potential recruiting ground for radicals. Nearly half of the economic activity of Swat depends upon horticulture and related agro-based industries.The peach and potato sectors create employment opportunities for a large number of people in Swat. But these sectors suffer from the usual bottlenecks (lack of certified inputs, non-standardization, unavailability of pulping facilities, etc.) that hamper the realization of higher economic value. The Project has devised plans to raise the income levels of peach and potato growers by rehabilitating flood-affected orchards and fields and through value chain up-gradation.

Baseline Survey of Potato and Peach Growers

The survey's overall objective is to establish a baseline of the peach and potato growers with reference to farm management and marketing practices with a specific focus on access to credit services and facilities, technical advice and training facilities, inputs supplies, market information, and market linkages. The findings are to help the project develop appropriate response strategies for better production and sales revenue for beneficiaries.

For survey design, the Consultants followed the sample size agreed during the kick-off meeting for the potato and peach growers as 135 and 188 respectively. This sample was distributed among 6 potato sowing and 10 peach growing clusters. The field-tested survey tool provided by the Project was refined by the Consultants before administration. Two teams (1 for each sector) collected data from1 to 6 June 2012. Data entry, data cleaning, syntax writing, table generation, analysis and narrative report writing were done in-house by the Consultants.

Following are the summary findings of the survey for potato and peach sectors.

Finding of Potato Survey

The classification of potato farms with regards to ownership type, management and irrigation sources shows that nearly all farms are self-cultivated (94%) and self-managed (90%). Irrigation sources are river/stream, springs and tube wells. River/stream irrigated farms account for nearly all the potato farms (95%), the remaining being split between the other two irrigation sources. The terrain is not flat but nearly all farms are situated less than 2 km from the main road. Of the surveyed population most of the farmers (35%) reach main road in less than 5 minutes. Another 22% reach the main road in 6 to 10 minutes while an equal number take between 11 to 20 minutes. Nearly all the potato growers in Swat (97%) are small landholders (less than 6 acres). Only 4% own medium sized (6–25 acres) farms. Among the surveyed population potato cultivar Roco is the most popular with the highest number of farmers (54%) and the largest acreage under cultivation. This is closely followed by Raja which is being grown by 41% of farmers. Other cultivars - Diamont, Lady Rozetta and Sterna –were used by 11, 7 and 1% of the respondents in 2011.

Potato is mainly cultivated in three tehsils of Swat - Kalam, Behrain and Matta. Though most of the respondents were from Kalam, in terms of productivity tehsil Behrain tops the list.

An investigation into employment practices shows that temporary help is the main mode of farm labor with an average of 77 working days per acre in 2011. Family labor and permanent labor

average 44 and 60 days per acre in a season. Average number of hours worked per day for all types of labor was 7 hours.

One of the survey's main objectives was to investigate input costs and sales and income trends. Total cost of production includes input, harvesting and post-harvesting and miscellaneous cost. Sum total of these costs per acre was arrived at for year 2010 and 2011. This cost decreased slightly from USD852 in 2010 to USD823 in 2011. Average per acre sales figure for 2010 was USD1,666 which decreased to USD1,652 in 2011. Correspondingly average per acre income for 2010 was USD1,064 which decreased to USD1027 in 2011.

Self-marketing is the main mode of sales adopted by the potato growers. Of the 98 respondents 88% market their produce themselves while the rest rely on sub-contractors.

Tractor is the most commonly used modern technology adopted by 97% farmers out of 110 farmers, followed by sprayer machine (50%), harvesting bin (20%), and harvesting kit (6%).

Farmers were asked to rank their most pressing issues from a given list of 14 commonly faced problems in growing potatoes. The compilation of problems revealedby 135 farmers that unavailability of certified seeds was the most serious issue mentioned by 76% potato growers. This was followed by attack of disease (54%), insect/pest attack (40%) and unavailability of tools and machinery (33%). Nutrient deficiency was mentioned by 26% respondents while transportation, access to credit and increased cost of production were mentioned by 16, 13 and 11% farmers respectively. All other problems were mentioned by less than 10% of the respondents.

Out of the 110 farmers' sample replying about their sources of financing, 64% were self-financed, 33% by family and friends while 28% rely on commission agent/local money lender. Of the 135 surveyed population 91 farmers were not satisfied with their present financial arrangements but out of these only 62 were willing to utilize credit while the rest thought that the use of credit and interest-based transactions were unIslamic.

Project was the main source of information for 98% respondents. This was followed by family/friends/relatives (17%) and TV/Radio programs (7%). No government department or any national or international NGO was found making efforts for informing the potato farmers.

Farmers were asked about trainings they had received in 2011 from a list of 11 different types of trainings. Nearly all (94%) had received training in cultivating high yielding cultivars of potato. This was followed by nutrient management (54%), pest/insect management (54%), management of attack of disease (44%) and irrigation techniques (40%). Of those who received trainings, a good majority (68%) fully utilized them and engaged in improved potato farming practices. While 23% partially and 9% moderately adopted good farming practices as a result of the trainings.

Good farming practices most commonly adopted by the trainees included cultivation of high yielding potato cultivars (89%), land preparation and sowing techniques (61%), improved nutrient management (31%) and better selection of land parcels (26%). Improved insect/pest management and improved irrigation methods were adopted by 23 and 20% respectively.

When asked to pick their most urgent training need from a list of 14 possible trainings, cultivating better variety of potatoes was picked by 65%, followed by management of disease attack (59%), nutrient management (45%) and use of tools and machinery (40%). Pest/insect management was listed by 39%, irrigation methods 33% and sorting/grading/packaging by 21% farmers.

Recommendations for Potato Production

After thoroughly analyzing the data the following suggestions can be made to increase potato production and farmers' income:

- Role of farmers' cooperative, agriculture department and related government agencies, and NGOs need to be enhanced as their present contribution is negligible.
- Institutions providing supervised micro credit should be brought in the area.
- Latest market information should be provided to growers.
- Marketing and transport cooperatives should be encouraged.
- In time quality inputs should be ensured in sufficient quantities. Furthermore, seed and fertilizer purchase committees should be established.
- Supply of certified high yielding certified seeds of potato should be ensured.
- Use of farm machinery and efficient farm tools/kits should be encouraged by making them available in the local markets.
- Frequent interactions with farmers to solve their major hindrances are suggested.
- If possible local seasonal forecasts will help in damage control.
- High need for trainings arranged according to growers' priorities. Post training utilization should be supervised and monitored to increase training implementation.
- Trainings for record keeping on cultural practices and crop rotational systems need to be imparted as presently growers lack awareness about these factors contribution in yield formation.

Finding of Peach Survey

The classification of peach orchards with regards to ownership type, management and irrigation sources showed that majority of the orchards are self-cultivated (85%) and self-managed (98%). Irrigation sources are tube wells and river/stream, each method accounting for nearly 50%. The terrain of the survey area is hilly but 78% of orchards are situated less than 2 km from the main road.Majority (85%) of peach farmers in Swat are small landholders (less than 6 acres) withonly 14% owningmedium sized (6–25 acres) farms.Among the surveyed population peach cultivar NJC 84 was the most popular with highest number of trees, closely followed by cultivar Indian Blood. Other cultivars include Elberta, Maria Delezia and Carmon. Among the three surveyed tehsils Barikot was the most productive (avg. per acre production) in 2010 as Kabal and Babuzai were ravaged by floods. In 2011 fortunes reversed;Barikot suffered from erratic precipitation while the other two enjoyed normal climatic conditions.

An investigation into employment practices showed that temporary help is the main mode of farm labor with an average of 15 working days a year in 2011. Family labor and permanent labor average 5 and 18 days a year. Average number of working hours a day is 7, same for all types of labor.

One of the survey's main objectives was to investigate input costs and sales and income trends.Total costof production includes input, harvesting and post-harvesting and miscellaneous cost. Sum total of these costs per acre was arrived at for 2010 and 2011. This cost increased from USD819 in 2010 to USD1,142 in 2011. This increase traces the general trend of double-digit inflation in Pakistan over the last several years. Average per acre sales USD1,766figure for 2010 increased to USD2,095 in 2011. Correspondingly average per acre income USD1,123for 2010 decreased to USD968 in 2011.

Self-marketing is the main mode of sales adopted by the peach growers. Of the 184 respondents 67% market their produce themselves while 33% rely on sub-contractors.Tractor is the most commonly used modern technology adopted by 91% of the farmers, followed by pruning kit (66%), harvesting bin (65%), power sprayer (46%) and harvesting kit (45%). Only 3% of the farmers use storage bins for their produce.

When asked to rank their most pressing issuesfrom a given list of 13 commonly faced problems,farmers termed attack of disease as the most serious problem. This was followed by pest attack (62%), unavailability of certified plants (59%) and nutrient deficiency (54%).Post-harvest fruit loss was also mentioned by 34% of the respondents.

Out of the 188 farmers' sample replying about their sources of financing, 70% are self-financed, 32% by commission agent/local money lender while 12% rely on family and friends. Of the surveyed population 80 farmers were not satisfied with their present financial arrangements but out of these only 60 were willing to utilize credit while the rest thought that the use of credit and interest-based transactions were unIslamic. Those who approved of credit nearly 50% wanted it in the range of USD116 to 2,877.

Project was the main source of information for 95% of the respondents. This was followed by family/friends/relatives (63%) and TV/Radio programs (32%). Only 5% farmers received information from government sources such as the agriculture department.

Farmers were asked about trainingsthey had received in 2011 from a list of 11 different types of trainings. Nearly all (91%) received training in pruning. This was followed by pest management (76%), plant disease management (75%), nutrient management (56%), sorting and grading (43%) and packaging (37%). Those who received trainings only 6% fully utilized them and engaged in improved farming practices. Majority (65%) only partially adopted good farming practices followed by those who moderately adopted (29%) them. Good farming practices most commonly adopted by the trainees included improved pruning (85%), improved pest management (68%), improved disease management (64%) and better management of nutrients (51%). Better harvesting and packaging practices were adopted by only 29% and 27%farmers respectively. When asked to pick their most urgent training need from a list of 15 possible trainings, soil sampling was selected by 69%, followed by leaf analysis (66%), disease management (50%) and pest management (47%). Again picking and packaging were low on the training needs assessment, 22% and 20% respectively.

Recommendations for Peach Production

After thoroughly analyzing the data the following suggestions can be made to increase peach production and farmers' income:

- Role of farmers' cooperative, agriculture department and related government agencies, and NGOs need to be enhanced as their present contribution is negligible.
- Institutions providing supervised micro credit should be brought in the area.
- Latest market information should be provided to growers.
- Marketing and transport cooperatives should be encouraged.
- In time quality inputs should be ensured in sufficient quantities.
- Supply of certified high yielding transplants of peach should be ensured.
- Use of machinery and efficient orchary tools/kits should be encouraged by making them available in the local markets.
- Frequent interactions with farmers to solve their major hindrances are suggested.
- If possible local seasonal forecasts will help in damage control.
- High need for future trainingsarranged according to growers' priorities. Post training utilization should be supervised and monitored to increase training implementation.
- Farmers should be trained in the areas of pruning, standardized plant to plant spacing, leaf analysis, and nutrient spraying.

1. INTRODUCTION

1.1. Introduction and Background

The objective of the Project is to improve government service delivery and develop dynamic, internationally competitive firms to accelerate sales, investment, and job growth to undercut the basis of extremism. The Project aims to work in at-risk districts such as Swat. Known for its fruits (apples, peaches, plums, apricots, and persimmons) and vegetables (onions, potatoes, tomatoes, turnips, peas, cabbage, etc.),currently 44% of the Swat district economy is based on horticulture, which indirectly supports other sectors such as tourism and other agro-based industries.

The peach and potato sectors create employment opportunities for a large number of people. Despite this, a significant amount of produce is wasted due to pre and post-harvest losses. Additionally the growth of these sectors is limited due to a lack of access to inputs supplies, market information, market linkages, and credit facilities as well as an untrained work force, poor management practices, inability to meet product standards (quality, consistency, hygiene, etc.), and unavailability of pulping units to utilize B, C, and D grade fruit for pulp processing and value additions. Increasing the economic value of these sectors begins with minimizing losses during pre- and post-harvest, increasing yields, and diversifying end market opportunities for producers. The Project has devised peach and potato sector development projects to improve production and increase sales revenue for the identified horticulture value chains in vulnerable areas of Pakistan and by doing so, is supporting the rehabilitation and recapitalization of conflict and flood-affected Small and Medium Enterprises (SMEs).

1.2. District Swat

An administrative district in the KhyberPakhtunkhwaprovince, Swat is a valley located close to the Afghan-Pakistanborder. It is the upper valley of the SwatRiver, which rises in the HinduKush range. A princely state which was dissolved in 1969, its capital is Saidu Sharif but the main town is Mingora. Dominated by ethnic Pashtuns, with Pashto/Pakhto as the main language, the valley with high mountains, green meadows and clear lakes is a place of great natural beauty popular with tourists.

According to the last census in Pakistan carried out in 1998, Swat's population was 1,257,602. However the population was 715,938, according to the census in 1981.

The people of Swat are mainly Pakhtuns, Yusufzais, Akhund Khel Miangan (Syed), Chitralis, Kohistanis, Gurjar (or Gujar is the major tribe of the district; its people are divided in different clans like Khatana, Bajarh, Chichi, Ahir, Chuhan, Pamra, Gangal etc), Akhund Khel Yousafzai, Nooristani, and Awans.

The Dardicpeople of the Kalam region in northern Swat are known as Kohistanis and speak Torwali and Kalami languages. There are also some Khowar speakers in the Kalam region. This is because before Kalam came under the rule of Swat, it was a regional tributary to Chitral. The Kalamis paid a tribute of mountain ponies to the Mehtar of Chitral every year.

1.3. USAID Firms Project Brief

The Project is developing a dynamic, internationally competitive, business sector in Pakistan that is increasing exports, employing more people and producing higher value added products and services. The Project is accomplishing all this by working at the policy level, with business

sectors and with individual firms to improve productivity and competitiveness with a focus on 20 of Pakistan's fastest growing districts.

1.4. Objectives of Baseline Survey

The overall objective is to establish a baseline of the peach and potato growers with reference to farm management and marketing practices with a specific focus on access to credit services and facilities, technical advice and training facilities, inputs supplies, market information, and market linkages. The findings of this survey would help the Project develop appropriate response strategies for better production and sales revenue for beneficiaries. The collected data that would serve as a basis of comparison with endline data as well as helping the Project team in project design and implementation of interventions. The survey's specific objectives are:

- Assessment of farms management practices, access to credit services/facilities, access to input supplies, market information and market linkages for peach and potato growers;
- Mapping of different varieties of peach and potato being cultivated by farmers and assessment of production and yield for each variety; and
- Conduct training needs assessments of the peach and potato growers.

1.5. Scope of Work

The specific tasks for the baseline survey are; (i) questionnaires finalization, (ii) data collection, (iii) analysis; and (iv) report writing. Detailed scope work is included in Terms of Reference attached as Appendix 1.

2. METHODOLOGY

The first step was assignment structuring in which our Team Leader and Assignment Coordinator worked with the Project's team to understand the survey objectives, its use, and level of efforts required to successfully complete the baseline survey.

2.1. Sample Size Calculation

2.1.1. For Potato Growers

The baseline survey target population was growers who agreed to participate in the potato sector initiative. Following formula was used to calculate the sample size for the study with 95% confidence level:

$$\text{Sample Size (n)} = \text{Deff } [(Z\alpha + Z\beta)^2 * \{Pb\ (1 - Pb) + Pe\ (1 - Pe)\}] / (Pe - Pb)^2$$

Where,

Design effect (Deff) is set at 1.2

Zα (significance) is set at 1.645 and the Zβ (power) is set at 1.645

Proportion at baseline (Pb) is set at 0.5 (50%)

Proportion at end line (Pe) is set at 0.65

By applying this formula the total required sample came to 276.

The total number of beneficiary farmers was expected to be (280) but at the time of survey, it was actually 176, which was relatively small, and therefore the sample didn't need to be large. We thus adjusted "n" by a finite population correction factor to obtain the required sample size as follows:

$$N = n_o / [1+\{(n_o -1)/N\}]$$

Where,

n = sample size

N = Population size (i.e. total number of participating peach growers)

n_o = sample size to be adjusted

The total sample required came to 108.

However, the sample also took into account the fact that some farmers refuse to participate. We also expected some of the farmers to be absent, (non-participation-NP) at the time of the survey and the possibility of missing or doubtful values (non-response - NR). We estimated that NP = 5% and NR =5%.

ST=ROUNDUP(n*(1+NP)*(1+NR),)

By applying this formula the total required sample came to 119.

However, 135 potato growers were randomly selected instead of 119to reach a sample. Due to this the accuracy increased causing the level of confidence to reach 97.5% and the power was raised to 99%.

2.1.2. For Peach Growers

The baseline survey target population for the peach sector is those growers who agreed to participate in the peach sector initiative. Following formula is used to calculate the sample size for the study:

Sample Size (n) = Deff [(Zα + Zβ)2 * {Pb (1 - Pb) + Pe (1 - Pe)}] /(Pe -Pb)2

Where,

Design effect (Deff) was set at 1.2

Zα (significance) set at 1.645 and the Zβ (power) is set at1.645

Proportion at baseline is set to 0.5 (50%)

Proportion at end line is set to 0.65

By applying this formula the total required sample comes to 276.

As the total number of beneficiary farmers (440) is relatively small, the sample does not need to be large. We thus adjusted n by a finite population correction factor to obtain the required sample size as follows:

$N = n_o / [1+\{(n_o -1)/N\}]$

Where,

n = sample size

N = Population size (i.e. total number of participating peach growers)

n_o = sample size to be adjusted

The total sample required came to 170.

However, the sample also took into account the fact that some farmers refuse to participate.Some of the farmers were absent, (non-participation-NP) at the time of the survey and the possibility of missing or doubtful values (non-response - NR). We estimated that NP = 5% and NR =5%.

ST=ROUNDUP(n*(1+NP)*(1+NR))

By applying this formula the total required sample came to 188.

These 188 peach growers were randomly selected from the 10 clusters. The selection was made by proportional allocation of the sample size to each cluster and the sample of 188 was proportionally distributed among these 10 clusters on the basis of their size.

After the survey was conducted, it was found that all 188 farmers responded to the questionnaires, increasing accuracy and decreasing errors.

Type 1 error i.e. “α” decreased from 0.05 to 0.025 consequently the degree of certainty and “1-α” became as .975 which was the confidence level.

2.2. Sampling Strategy

2.2.1. Data Collection of Potato Farm

To conduct the baseline survey of 135 potato farmers in Swat district, a two-stage cluster sampling strategy was adopted. To reach the sample target of 135 potato farmers; six clusterswerevisited.Farmers from each cluster wererandomly selected to achieve the target. At the first stage, available farmers were randomly selected from all six clusters. Project provided the list of 165 beneficiaries to meet the target of 135 farmers. Final respondent selection for the potato survey is given below:

Table 1: Potato Farms Visited in Different Clusters

Cluster Name	Farmers Interviewed	% Farmers Interviewed
Sakhra	16	11.9
Mankyal	5	3.7
Cherat	35	25.9
Kargilo	38	28.1
Gorkin	32	23.7
Kas Kalam	9	6.7
Total	135	100.0

2.2.2. Data Collection of Peach Farm

To reach the sample target of 188 peach farmers in Swat district, a two-stage cluster sampling strategy was adopted. Ten clusterswerevisited to interview randomly slected farmers from each cluster. Table 2 shows the total of 188 farmersinterviewed by field teams in clusters.

Table 2: Peach Farms Visited by Clusters

Cluster Name	Farms Interviewed	% Farms Interviewed
Kota	20	10.6
Churkhai	18	9.6
Abubakar Khel Aboha	20	10.6
Shamozia	19	10.1
Kotlai	17	9.0
Hazara & Guljaba	18	9.6
Koza Bandai	19	10.1
Kabal & Sersenai	19	10.1
Bara Banda	19	10.1
Tindodag	19	10.1
Total	188	100.0

2.3. Respondents

The respondents were defined as the peach and potato growers who agreed to participate in peach and potato sector development initiative.

2.4. Survey Instrument

Since the Assignment was mainly based on primary data, it was of great importance to develop data collection tools with extra concentration and seriousness. Data collection instruments in English and Urdu versions were developed by Client and provided to Consultants after pre-testing. Final questionnaire was developed with the approval of Client by considering the following characteristics:

- It was clear and understandable;
- It was designed as per the field settings of the selected region;
- Responses were simple to record;
- It was easy to assign codes to the open-ended questions; and
- No section was left open to allow for ambiguity while writing responses.

Final questionnaires of potato and peach sectors in English/Urdu merged versionsare attached as Annex II, Annex III respectively.

2.5. Selection of Field Teams

To ensure that quality data is collected, the following steps were followed for team field selection and composition:

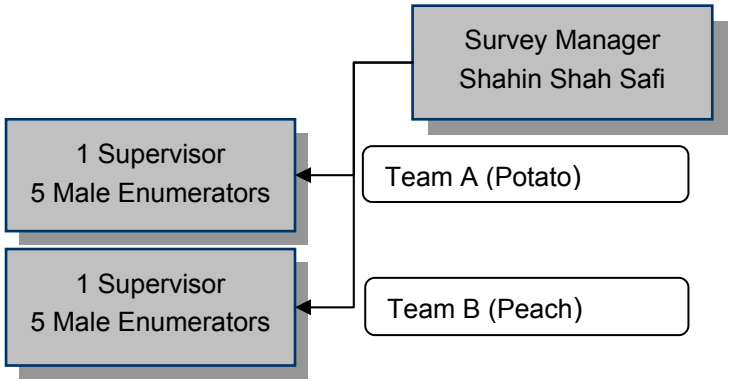
The Consultants interviewed the supervisors and enumerators from its current database. The enumerators were selected based on following indicative criteria:

- Education; minimum of *intermediate* (equivalent to 12 years of education);
- Preferably a local of the district;
- Understanding of the agriculture/horticulture sector and related issues;
- Well versed with local languages and geography;
- Prior field research experience preferred; and
- Pleasant personality and honesty.

2.5.1. Field Teams Composition

The Consultants engaged two field teams. Each team consisted of 1field supervisor and 5male enumerators. Thus, 2 supervisors and 10 males were appointed to accomplish the data collection activity before deadline. The Consultants also trained 3 extra male enumerators as a backup for the field teams. The figure below represents the field team composition:

Figure 1: Field Team Structure



2.5.2. Survey Training for the Orientation of Tools

Various support activities were also planned and performed together with the core tasks. The pre-field activities included training of enumerators, mock survey, logistic arrangement, boarding & lodging etc.

Survey guidelines were developed by supervisors and enumerators as part of the training activities. It was ensured by trainer during the training that each traineehad developed his own comprehensive survey guidelines to be used in the field. It was developed in handwritings of trainees and its contents were finalized after detailed discussions on each of the indicators of the data collection tool.After training on quality control, mock exercise was conducted by each trainee. Every participant filled the training evaluation form at the end.

All issues related to survey were recorded and addressed by trainers.The objective was to impart the following knowledge and skills:

- Overview of the Assignment.
  - Explaining project background and its future Impact.
  - Survey objectives and methods.
- Company and self-introduction.
- Ethical guidelines and issues regarding survey.
- Informed consent presented and discussed.
- Detailed instructions on procedures and questionnaire.
  - Method of replacing respondents.
  - Training on how to select respondents.
  - Method of asking questions (mode of addressing the respondents).
  - Participants training on how to conduct an interview.
  - Participants discussed and understand selection biases.
  - Participants discussed challenges with the questionnaire.

- Complete understanding of what each of the questions is intended to ask.
  - Practice reading questionnaire in field.
  - Field exercises, additional instructions to follow during field stay.
  - Practice on recording the responses.
- Protocol for data/information security.
- Logistics and field security training.

2.5.3. Data Editing, Entry and Cleaning

Data editing was conducted at two stages. The completed questionnaires were reviewed by Supervisors daily in field and again when questionnaires were pooled in at central office for data entry. Data entry module was developed in CSPro with inbuilt checks to avoid errors. Data entry was done simultaneously with collection of data. The Data Entry Supervisor in the team was in-charge of the data entry process and later cleaning. The data file was then generated using Statistical Package for Social Sciences (SPSS 20) to clean the data.

2.5.4. Data Analysis

Consultants developed the analysis plan to meet the objective of the study. Data tables were generated using SPSS, which were analyzed by subject expert.

2.5.5. Informed Consent

The data enumerators were trained to observe the ethical considerations. It was considered that every individual had the right to refuse to participate or answer specific questions. A verbal consent was obtained from every respondent before asking questions and it was ensured the survey was conducted solely on the willingness of the respondent. The field staff was trained in clarifying apprehensions of the respondents if there were any.

2.5.6. Quality Control

As per Consultants policy,additional enumerators were appointed to account for dropouts during training and data collection activity.Training was conducted by trainers according to the monitoring protocols developed with the coordination of Client. During data collection, survey supervisors observed and checked most of the questionnaires to ensure that interviewers were collecting and recording data accurately, and that questionnaires were filled in completely. Supervisors checked the questionnaires before the interviewers left the cluster so that they could be corrected. They also maintained sample tracking form for continuous monitoring and also investigated all households/farmers that refused or were not at home. The Supervisor reported to Project's team; the respondents that were not at home and the survey issues,which were addressed after coordination. Additionally random monitoring checks were carried out by Field Managerappointed by Consultants.

Sample tracking form wasalso used by supervisor, containedcluster wise detail of daily targets and questionnaire status.During survey some farmers not available at home were visited by field teams twice with the instruction of Project's field representative. Project monitored the whole activity of Assignment, specifically field work through spot checks, reviewing of the filled questionnaires, edited questionnaires and observed the data collection method of enumerators.

Project shared the list of quality checks for training and survey. Training was continuously monitored by Project's representative. Training schedule was shared with Project along with detailed field calendar for easy and surprise monitoring of activities. Following key parameters were checked and validated by Project during training and survey:

- Survey objectives and methods.
- Ethical guidelines and issues.
- Training of participants on selection of respondents, selection biases, how to conduct interview, challenges with the questionnaires and quality controls.
- Role playing in pairs and mock exercise.
- Training evaluation form and issues recorded addressed appropriately.

- Supervisor evaluated all interviewers.
- Enumerators filled the questionnaires under the supervisor.
- Supervisor spot checked the interviews.
- All questionnaires were edited in the field following consistency check procedures.
- None of the questionnaires signed off by the supervisor had missing and inconsistent data.
- Supervisor prepared the questionnaire tracking form.
- Supervisor reported the problems to Field Manager.

3. POTATO SURVEY FINDINGS

3.1. Basic Information on Potato Farmers

3.1.1. Types of Farm Ownership, Management and Sources of Irrigation

Farm production is an integration of human, physio-chemical, and environmental factors. As one of the most important, human factorsnecessitated that status of farm ownership and management should be evaluated. Results of this investigation in Table 3show that ownership of land in Swat district is divided in three types: self-cultivation, lease and *dehkani*. The survey shows that out of 135 farmers, 127 (94%) are self-cultivators whereas number of leased and *dehkani*farmers are 7(5%) and 1(1%) respectively.Out of 135 farmers,122 (90%) are self-managers. Farmers in tenant and *dehkani*categories are 11(8%) and 2(1.5%) respectively.

Agriculture depends on different sources of irrigation where rainfed agriculture is not possible. Farm management, yields and profitability are directly related with the type of irrigation applied.

With irrigated agriculture practiced in the survey area, it was important to know the sources of irrigation used by farmers. Table 3shows that 128 (95%) farmers use river or stream irrigation. Tube well and spring irrigationswereapplied by 4 (3%) and 3 (2%) respectively.

Table 3: Types of Farm Ownership, Management &Irrigation

Description	No. of Farmers Responded in each Category	% of Farmers Interviewed
Status of Ownership	(n=135)	
Self-cultivated	127	94.1
Leased in	7	5.2
Dehkani	1	0.7
Status of Management	(n=135)	
Self-managed	122	90.4
Tenants	11	8.1
Dehkani	2	1.5
Source of Irrigation	(n=135)	
River/Stream	128	94.8
Spring	4	3.0
Tube well	3	2.2

3.1.2. Distance and Time Taken by Foot from Farm to Main Road

Profit depends on farm inputs-outputs balance which is a function of marketing. Marketing is a complex mechanism depending on many factors; main road proximity is one of them, particularly in hilly terrain. Distances in Table 4 show that 74 (55%) and 49 (36%) farmers respectively reported that their farms weresituated at a distance of less than 1 and between 1 to 2 km. Corresponding number of farmers falling between 3 and 4 km and above 4 km classes are 9 (7%) and 3 (2%) respectively. Out of total 135 farmers,47 (35%) and 30 (22%) farmers fell in up to 5 minutes and from 6 to 10 minutes time slots respectively to reach the main road. Average time required by 29 (21%) and 21 (16%) farmers reported from 11 to 20 minutes and from 21 to 30 minutes respectively. Table also shows that only 8 (6%) farmers fell in the slot of more than 30 minutes travel time. Furthermore 74 (55%) farms were situated near the main road showing easy accessto market.

Table 4: Distance and Time Required by Foot to Reach from Farm to the Main Road

Description	No. of Farmers Responded in Each Category	% of Farmers Interviewed
Distance	(n=135)	
< 1 KM	74	54.8
1-2 KMs	49	36.3
3-4 KMs	9	6.7
> 4 KMs	3	2.2
Time Required	(n=135)	
0-5 minutes	47	34.8
6-10 minutes	30	22.2
11-20 minutes	29	21.5
21-30 minutes	21	15.6
> 30 minutes	8	5.9

3.1.3. Landholding Size of Potato Farms

Landholding size of farm in Pakistan determines owner's wealth, social status, and political influence. Farmers interviewed about their acreagewere classified into different categories presently used in Pakistan. Overall analysis shows that majority of farmers in Swat were small landholders. In 2010, 110 (96%) farmers owned less than 6 acres land,a small farmercategory. The number remained almost the same in 2011 – 105 (95%). Medium size landholders were4 (4%) in 2010 and 5 (5%) in 2011.

Table 5: Farms' Classification by Area with No. of Farmers in Each Category

Farm Category in Acres		2010		2011	
		No. of Farmers Responded in Each Category	% of Farmers	No. of Farmers Responded in Each Category	% of Farmers
Small	(< 6)	110	96.5	105	95.5
Medium	(6 – 25)	4	3.5	5	4.5
Total		114	100	110	100

3.1.4. Number of Farmers with Different Cultivars, their Acreage and Yield

In our survey area 4 potato cultivars in 2010 and 5 cultivars in 2011 were sown. In 2010 (Table 6), out of 99 farmers interviewed 56 (57%) and 45 (46%) farmers cultivated cultivars of Rocoand Raja on 90 and 86 acresrespectively with corresponding average yield per acre of 4,087 and 3,222kg. Cultivars Diamont and Desiree were sown by 8 (8%) and 1 (1%) farmers on 20 and 2 acres respectively with corresponding average per acre yield of 6,706 and 1,520kg. Very low yield potential of Desiree explains its low acreage and few farmers growing it.

The results of same survey for 2011 are tabulated in Table 7. In this year 5 cultivars were sown by 103 farmers. Lady Rozetta was grown by 7 (7%) on 18 acres with per acre average yield 1,463kg. Roco and Raja were sown by 54 (52%) and 42 (41%) farmers on 80 and 76 acres respectively with corresponding average per acre yield of 4,043 and 3,373 kg. Diamont was grown by 11 (11%) farmers on 20 acres with average per acre yield of 7,782kg. Realization of optimum potential of high yielding cultivars depends on many factors, environment being one of them. Each year is different in micro-climate which affects yield. One way of comparing cultivars yield potential is to compare their yields from different years on the same farms. This was done here and it was realized that cultivar Diamont yielded on average per acre 7,782kg in 2011 vs 6,706 kg in 2010 which is a 16% increase. A comparison of above values revealed that 2011 was a better year for potato production for high yielding cultivars than 2010. Medium yielding cultivar Roco and Raja did not show significant difference between the two years which is normally the case for medium yielding cultivars.

Table 6: Farmers with Different Potato Cultivars, Their Acreage& Production in 2010

Potato Cultivars	No. of Farmers Responded in each Category	% of Farmers	Total Area in Acre	Total Production in Kg	Average Production per Acre in Kg
Roco	56	56.6	90	367,800.0	4,086.7
Raja	45	45.5	86	277,115.0	3,222.3
Diamont	8	8.1	20	134,125.0	6,706.3
Desiree	1	1.0	2	3,040.0	1,520.0
Total	99		198	782,080.0	3,949.9

Table 7: Farmers with Different Potato Cultivars, Their Acreage& Production in 2011

Potato Cultivars	No. of Farmers Responded in each Category	% of Farmers	Total Area in Acre	Total Production in Kg	Average Production per Acre in Kg
Roco	54	52.4	80	323,415	4,042.7
Raja	42	40.8	76	256,355	3,373.1
Diamont	11	10.7	20	155,650	7,782.5
Lady Rozetta	7	6.8	18	26,335	1,463.1
Sterna	1	1.0	0.12	150	1,250.0
Total	103		194	761,905	3,927.3

3.1.5. Major PotatoSowing Tehsils in Swat District

Potato is mostly grown in three tehsils of Swat district. It was decided to collect and compare information among tehsils to know the order of suitability for potatosowing among tehsils. Table 8 shows 99 growers in 2010 were interviewed in all tehsils. In tehsilsKalam and Behrainwhere 93 and 5 farmers were interviewed, potato cultivars sownon185 and 11 acres land with 6,474 and 11,318kg per acre production respectively. In tehsil Matta only 1 farmer had 1 acre farm with 400kg per acre yield. When average production per acre from 2010 is compared with 2011, tehsil Mattawasbehind other two tehsils. Number of respondents increased from 93 to 95 and from 1 to 3 in 2011 in Kalam and Matta tehsils respectively. Percent differences between years show 1% decrease in 2011 in tehsil Behrainand 15% decrease in Matta, whereas 2% increase was reported in tehsil Kalam. These big differences forced us to look for reasons. In 2011 adverse climatic conditions, mainly erratic precipitation, reduced per acre yield in tehsilsBehrain and Matta. Results and reasons show that all tehsils are suitable for potato production under normal climatic conditions. Very few farmers having farms in tehsil Mattacompared to other two tehsils had to do with different agricultural practices and preferences for other crops.

Table 8: Tehsil Wise Acreage &Production of Potato with No. of Farmers

	2010				2011				% Change in Average Production Per Acre of Potato
Tehsil Name	No. of Farmers Responded in each Category	Total Farm Area in Acre	Total Production in Kg	Average Production Per Acre	No. of Farmers Responded in each Category	Total Farm Area in Acre	Total Production in Kg	Average Production Per Acre	
Kalam	93	185	725,090	6,474	95	178	704,885	6,588	2
Behrain	5	11.4	56,590	11,318	5	11.36	56,000	11,200	-1
Matta	1	0.5	400	400	3	4.94	1,020	340	-15
Total	99	198	782,080	3,950	103	194	761,905	3,927	

3.1.6. Total Cost of Production

Farming has two maininputs; (i) material and (ii) labor. Detailed survey was conducted to know the types and cost of these inputs as farm productivity depends mainly on them. Besides these inputs, harvesting/post harvesting and marketing costs combined together with other costs give total cost of production.

Like all other enterprises costing factor in potato production was necessary to be calculated to arrive at the cost-benefit balance. In Table 9 production and marketing cost analysis is presented. Total cost is segregated into input costs, harvesting/post harvesting, and miscellaneous costs for the years 2010 and 2011. Number of farmers interviewed in both years is almost the same. Material cost was borne by all 114 farmers. Permanent labor was hired only by 22 and 18 farmers in 2010 and 2011 respectively. The corresponding numbers for hiring temporary labor were 103 and 102 and those for family labor were 87 and 81, showing that temporary labor wasemployed in the highest numbers to cover peak operations like hoeing, pruning, spraying etc. Total input cost per acre was USD539 and USD506 in 2010 and 2011 respectively. Cost difference in years is due to acreage differences. A comparison between components of input costs and harvesting and post harvesting costs showed almost the same trend.

Table 9: Total & Average per Acre Production and Marketing Cost of Potato

Description	2010				2011			
	No. of Farmers Responded in each Category	Total Cost in USD	Total Farm Area in Acres	Average Cost Per Acre in USD	No. of Farmers Responded in each Category	Total Cost in USD	Total Farm Area in Acres	Average Cost Per Acre in USD
A- Total Input Cost								
Material Cost	114	64,090.0	212.0	302.3	110	54,509.6	206.8	263.5
Permanent Labor	22	5,883.3	41.3	142.6	18	7,382.8	44.5	166.0
Temporary Labor	103	30,225.3	192.7	156.8	102	29,903.6	185.3	161.4
Family Labor	87	14,035.9	149.3	94.0	81	12,882.4	132.5	97.3
Total	114	114,234.6	212.0	538.8	110	104,678.4	206.8	506.1
B- Total Harvesting and Post Harvesting Cost								
Material Cost	79	9,327.2	156.2	59.7	86	7,851.0	158.6	49.5
Permanent Labor	12	1,876.7	32.6	57.5	10	798.7	23.2	34.4
Temporary Labor	77	11,902.6	153.2	77.7	89	13,922.7	163.6	85.1
Family Labor	37	3,216.9	78.8	40.8	42	2,680.8	81.5	32.9
Total	79	26,323.4	156.2	168.6	89	25,253.1	163.6	154.4
C- Miscellaneous								
Transportation, Munshiana (Market Record Keeping Charges), Market Fees, Commission etc.	83	39,993.9	159.6	250.5	82	40,456.7	143.3	282.3
Total Cost of Production and Marketing (A+B+C)	**114**	**180,551.8**	**212.0**	**851.7**	**110**	**170,388.2**	**207.0**	**823.1**

3.2. Farm Employment Details

As farm employment is an important component of potato production, it was decided to study this in details. Table 10shows that in 2010, 110 (98%) farmers out of total 112 interviewed,employedtemporary labor during peak working days. Table 10 also shows that number of farmers employing permanent and family labor were only 27 (24%) and 87 (78%) respectively. Coming to total days per year it is noted that temporary labor amounted to 11,068total days averaging 69 days per acre. It was followed by family labor with 4,539 days, averaging 45 days per acre. The facts show the importance of potato sowing for temporary farm labor in the area as alternativesources of employment are extremely few. It can be safely said that potato cultivation plays a pivotal role in the local economy. The corresponding values for 2011 in Table 11 show exactly the same trend.

Table 10: Total & Average Per Acre Farm Employment Days in Different Labor Categories in 2010

Labor Category	No. of Farmers Responded in each Category	% of Farmers	Total Employed Labor	Total Days	Average Days Per Acre
Permanent	27	24.1	364	1,933.0	43.7
Temporary	110	98.2	3,770	11,068.0	68.6
Family	87	77.7	1,360	4,539.0	45.2
Total	112		5,494	17,540.0	

Table 11: Total & Average per Acre Farm Employment Days in Different Labor Categories in 2011

Labor Category	No. of Farmers Responded in each Category	% of Farmers	Total Employed Labor	Total Days	Average Days Per Acre
Permanent	19	17.6	304	1,756	60.3
Temporary	108	100	3,809	10,952	77.2
Family	84	77.8	1,302	4,214	44.4
Total	108		5,415	16,922	

3.2.1. Cost of Labor Employed in Potato Farms

The data above have shown that potato farms are a major source of employment Swat. It was thus tried to probe the total cost incurred on labor which is also a direct financial contribution to the local economy. In Table 12 in 2010 the total cost is USD67,641split up into permanent, temporary, and family labor along with their numbers and number of employers. Corresponding values and details for 2011 are in Table 13. In this year total cost is USD67,571 which is a nominal decrease. In 2011 labor cost increased for permanent and temporary labor partially due to increase in labor charges and labor numbers, a normal trend. This normal trend shows a reversal in family labor when corresponding columns of labor number, total cost or average cost per acre are compared. In 2011 family labor numbers decreased from 1,360 to 1,302, a nominal decrease.In spite of this decrease, total cost was decreased by 10% from USD17,379 to 15,563. On this abnormal situation the employers replied that new laborers who worked for the first time in this year demanded lesser wages. Due to less wage demand by these laborers, wages of family labor were reduced, which is typical effect of supply and demand or market competition.

Table 12: Total & Average per Acre Cost of Labor in Different Labor Categories in 2010

Labor Category	No. of Farmers Responded in each Category	Total Employed Labor	Total Farm Area in Acres	Total Employment Cost in USD	Average Employment Cost Per Acre in USD
Permanent	27	364	52.6	7,785.2	147.9
Temporary	110	3,770	206.6	42,477.1	205.6
Family	87	1,360	149.3	17,379.2	116.4
Total	112	5,494		67,641.4	

Table 13: Total & Average per Acre Cost of Labor in Different Labor Categories in 2011

Labor Category	No. of Farmers Responded in each Category	Total Employed Labor	Total Cultivated Area in Acres	Total Employment Cost in USD	Average Employment Cost Per Acre in USD
Permanent	19	304	46.0	8,181.5	178.0
Temporary	108	3809	195.5	43,826.3	224.2
Family	84	1302	138.1	15,563.1	112.7
Total	108	5,415		67,570.9	

3.2.2. Details of Working Days of Labor in PotatoFarms

As major employment source for locals, labor is one of the most important inputs in potato sowing. Therefore, total number of labor employed in each category per year with total working days in a year and average working days per year for 2010 and 2011 are tabulated in Table 14. Data in the table for 2010 show that in permanent category364 laborers were employed and worked for 7,465input days on 52 acres of farm. Temporary category 3,770 laborers were employed and worked for 40,687 days on 206 acres of farm. A total of 1,360 family laborers worked for 15,840 days in total on 149 acres. Corresponding values in 2011 show the same trend and gave almost similar results.The comparisonshowsthat farmers mostly employed temporary laborers.

Table 14: Different Labor Categories Employment Status on Potato Farms

Year	Permanent			Temporary			Family		
	Total No. of Labors Worked on Acres(--)	Total No. of Input Days Worked	Average Days Worked in Year	Total No. of Labors worked on Acres (--)	Total No. of Input Days Worked	Average Days Worked in a Year	Total No. of Labors Worked on Acres(--)	Total No. of Input Days Worked	Average Days Worked in a Year
2010	364(52)	7,465	20.5	3,770(206)	40,687	10.8	1,360 (149)	15,840	11.7
2011	304 (46)	7,900	25.1	3,809 (195)	42,336	11.1	1,302 (138)	14,553	11.2

3.2.3. Full Time Equivalent (FTE) for All Labor Categories

Table 15shows the number of laborers in each category, average working days per month, and average working hours per day for 2010. A look at the table shows that a permanent labor worked 21 days per year, whereastemporary and family labor worked for 11 days per year each. Interestingly all types of laborers on averageworked for 7 hours per day. In the same table Full Time Equivalent (FTE) for all labor categories is calculated by using the formula given in the table. FTE jobs for permanent labor are26 and for temporary and family labor the values are 140 and 54 respectively. FTE job per acre for permanent labor is 0.49 and for temporary and family labor the values are 0.68 and 0.36 respectively.

The corresponding values for 2011 in Table 16 show the same trend with almost comparable values with minor deviations due to yearly change.

Employment Figures in Hotels in Jan-Nov 2012

Total Number of Employees			Average Working Days/Year*			Average Working Hours/Day		
Permanent	Temporary	Family	Permanent	Temporary	Family	Permanent	Temporary	Family
* Average working days per year = total input days / no. of laborers								

Full Time Equivalent (FTE) for Year**				Full Time Equivalent (FTE) Per Hotel***			
Permanent	Temporary	Family	Total	Permanent	Temporary	Family	Total
** FTE = (# of employee * average working days per year *average working hours) /2080				*** FTE = (Full Time Equivalent for year / Corresponding acres			

Table 15: Employment Figures in Potato Farms in 2010

Total Number of Employees			Average Working Days/Year*			Average Working Hours/Day		
Permanent	Temporary	Family	Permanent	Temporary	Family	Permanent	Temporary	Family
364	3770	1360	20.5	10.8	11.6	7.15	7.13	7.08
* Average working days per year = total input days / no. of laborers								

Full Time Equivalent (FTE) for Year**				Full Time Equivalent (FTE) Per Acre***			
Permanent	Temporary	Family	Total	Permanent	Temporary	Family	Total
25.65	139.57	53.70	218.92	0.49	0.68	0.36	0.54
** FTE = (# of employee * average working days per year *average working hours) /2080				*** FTE = (Full Time Equivalent for year / Corresponding acres			

Table 16: Employment Figures in Potato Farms in 2011

Total Number of Employees			Average Working Days / Month*			Average Working Hours / Day		
Permanent	**Temporary**	**Family**	**Permanent**	**Temporary**	**Family**	**Permanent**	**Temporary**	**Family**
304	3809	1302	25.99	11.11	11.18	8.32	7.92	7.93
* Average working days per year = total input days / no. of laborers								

Full Time Equivalent (FTE) for Year**				Full Time Equivalent (FTE) Per Acre***			
Permanent	**Temporary**	**Family**	**Total**	**Permanent**	**Temporary**	**Family**	**Total**
31.6	161.13	55.5	248.23	0.69	0.83	0.40	0.65
**FTE = (# of employee * average working days per year * average working hours) / 2080				*** FTE = (Full Time Equivalent for year / Corresponding acres			

3.3. Sale and Income Values of Potato Growers

As sale and income is the final target of any business,so,135potato farmers were interviewed to collect their sales and income data for 2010 and 2011. Table 17and Table 18 show the overall distribution of farmers in categories: not sown, not sold, flood distruction and the farmers who successfully sold the production. Out of the total sample,31 (23%) farmers reported complete farm destruction due to floods and their production was 153,850 kg. Farmers that not sold prdocution (15,475 kg) were 7 (5%). Farmers that had no cultivation were 21 (16%), mostly due to new entry in the business for the year 2012.

Farmers who sold their production are 76 and plotted in different sale categories. From this sample 66 (87%) farmers sold potato in the USD441 to 4,681categories while 7 (9%) farmers fell in the second category from USD4,681 to 8,920. In addition 3 (4%) farmers earned the highest sale price falling in the range of USD8,920 to 17,400.

In Table 18 values of net income earned are also classified, scenario of no saleby 7 (5%) farmers and 21 (16%) suffered losses. Further probing revealed the following reasons for loss:

- Nutrient deficiency resulting inbad quality of potato.
- Lack of finances to buy inputs necessary for healthy successful crop.
- Unavailability of fertilizers at the right time.
- Not proper and in time harvesting due to lack of appropriate know-how.

Income data show that earnings of 43 (78%) growers were in the lowest category from USD23.5 to 2,664. After this,6 (11%) farmers fell in the next category from USD2,664 to 5,304. Only one farmer earned the highamount between USD10,584 to 13,224. Average sale value per acre is USD1,666 and average per acre income is USD1,064, given the market values.

Table 17:Potato Farmers' Status in Different Sales Categories in 2010

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers Who Sold Production (n=76)	Total Farm Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
Not Sown	21	15.6	-	-	-	-	-
Not Sale	7	5.1	15,475	-	9.4	-	-
Flood Destruction	31	23.0	153,850	-	72.9	-	-
440.8-4680.6	66	48.9	307,265	86.8	79.1	122,406.6	1,548.0
4680.6-8920.4	7	5.2	174,590	9.2	26.2	49,795.2	1,901.0
8920.4-13160.2	1	0.7	68,400	1.3	5.9	10,530.0	1,775.5
13160.2-17400.0	2	1.5	62,500	2.6	18.8	33,345.0	1,775.5
Total	135	100	782,080	100	129.7	216,076.8	1,665.6

Table 18:Potato Farmers'Status in Different Income Categories in 2010

Income Groups	No. of Farmers Responded in each Category	% of farmers	% of farmers who Get profit (n=55)	Total Farm Area in Acre	Total Income in USD	Average Income Per Acre in USD
Not Grown	21	15.6	-	-	-	-
Not Sale	7	5.1	-	-	-	-
Flood Destruction	31	23.0	-	-	-	-
Financial Loss	21	15.6	-	24.2	(92615.5)	(3,824)
23.5-2,663.6	43	31.9	78.2	51.9	44725.3	861.9
2,663.7- 5,303.7	6	4.4	10.9	16.3	19493.6	1195.3
5,303.7-7,943.8	4	3.0	7.3	18.8	24911.3	1326.5
7,943.8-10,583.9	1	0.7	1.8	8.9	9991.1	1123.1
10,583.9-13,224.0	1	0.7	1.8	9.9	13338.0	1349.4
Total	135	100	100	105.8	112543.5	1064.1

Note: Value in brackets represents financial losses incurred by potato growers

Table 19 and 20 show the total number of farmers interviewed, categories sales and income etc.Table 19showsthat as 2 (2%) farmers had very poor yield (1,710 kg) they did not sell and kept for self-consumption and as gifts for relatives and friends. Out of the total sample, 10 (7%) farmers reported complete farm destruction due to floods and their production was 9,850 kgFarmers, 25 (19%), had no cultivation because of new entry in business for the year 2012.

Data show that 70 (71%) farmers sold in the lowest sales category of USD139 to 3,584. Another 22 (22%) farmers fell in the next lowest category of USD3,584 to 7,029. Only 3 (3%) farmersrealized the highest sale amount of USD13,920.

Net earnings amounts are in Table 20. As 2 (2%) farmers did not sell, 25(19%) had no cultivation, and 24 (18%) suffered losses due to reasons given in Table 18.

Income data show that 65 (88%) farmers were in the lowest income category of USD143 to 4,043. In the next earning category of USD4,043to 7,944, there were 6 (8%) farmers, while 3 (4%) earned the highest amount between USD7,944 to11,845. Average sale value per acre is USD1,652 and average per acre income is USD1,027 – very close to market values gathered through secondary sources. There are nominal differences due to yearly change in total sales value and income value in 2010 and 2011.

Table 19:Potato Farmers'Status in Different Sale Categories in 2011

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers who Sold Production	Total Farm Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
Not Sown	25	18.5	-	-	-	-	-
Not Sold	2	1.5	1,710	-	11.4	-	-
Flood Destruction	10	7.4	9,850	-	15.1	-	-
139.2-3584.4	70	51.9	325,230	71.4	82.5	119,562.9	1,448.6
3584.4-7029.6	22	16.3	340,415	22.4	62.3	116,939.6	1,877.9
7029.6-10474.8	3	2.2	57,875	3.1	12.8	23,200.0	1,805.5
10474.8-13920.0	3	2.2	26,825	3.1	23.2	38,454.0	1,655.5
Total	135		761,905	98	180.4	298,156.5	1,652.8

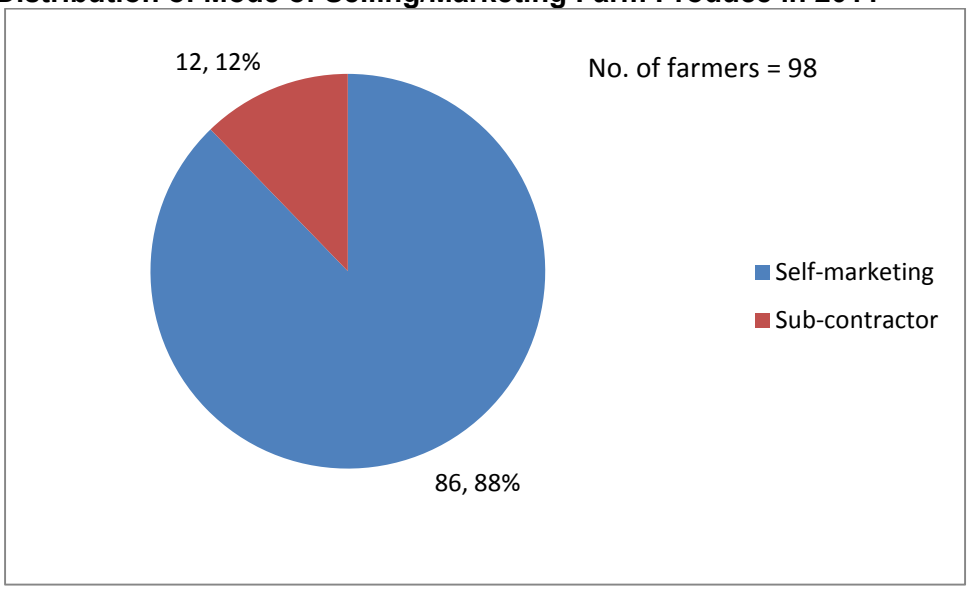
Table 20:Potato Farmers'Status in Different Income Categories in 2011

Income Groups	No. of Farmers Responded in each Category	% of Farmers	% of Farmers who Get profit	Total Farm Area in Acre	Total Income in USD	Average Income Per Acre in USD
Not Sown	25	18.5	-	-	-	-
Not Sold	2	1.5	-	-	-	-
Flood Destruction	10	7.4	-	-	-	-
Financial Loss	24	17.8	-	28.7	(12,356.7)	(431.1)
142.7-4043.4	65	48.1	87.8	107.7	95,122.2	8,82.9
4043.4-7944.1	6	4.4	8.1	20.8	28,138.2	1,355.6
7944.1-11844.8	3	2.2	4.1	23.2	32,558.9	1,401.7
Total	135		74	151.7	155,819.3	1,027.0

3.3.1. Channels of Marketing Adoptedby Potato Farmers

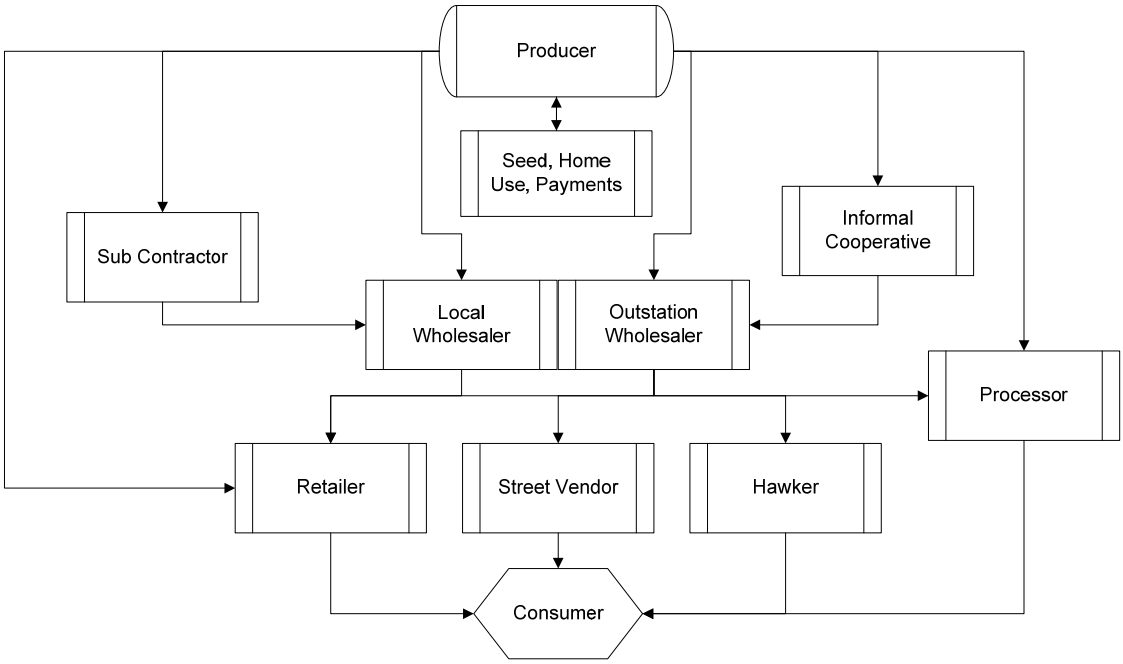
Ultimate object of farming is to market farm produce.Farmers use different channels for marketing depending on their suitability/availability. Therefore, survey on marketing channels was conducted. Results in Figure 2 show that out of 98 farmers,86 (88%) did self-marketing whereas only 12 (12%) used the services of sub-contractors.

Figure 2: Distribution of Mode of Selling/Marketing Farm Produce in 2011



Farmres frequently used method of self-marketing tosell their production to local and outstation wholesaler. Wholeseller sold production to retailers and consumer purchased potato from retailers.

Figure 3: Marketing Channel of Farm Produce

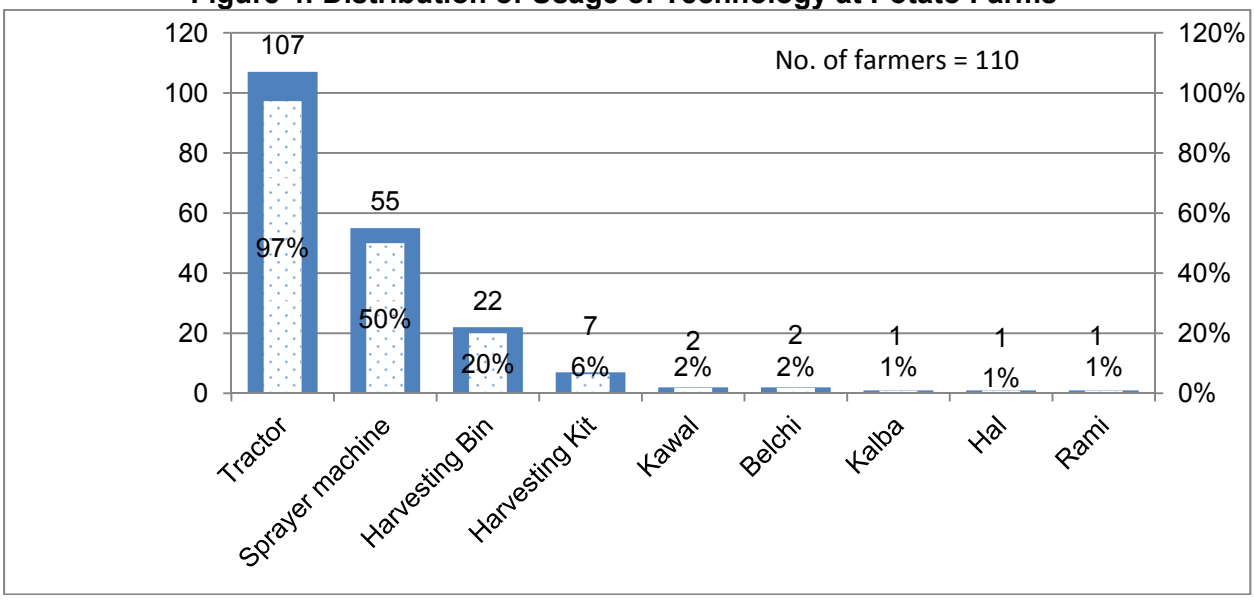


3.3.2. Usage of Technology by Potato Farmers

In the survey area different potato production technologies are used. As type of technology has an impact on yield and influences all farm cultural practices, it was important to survey the types and intensity of technologies used.

Data in Figure4 show that presently 9 different types of technologies are in use. Percentages of farmers using them are arranged in descending order to readily understand their importance in the area. Out of 110 farmers interviewed, 107 (97%) and 55 (50%) are using tractor and spraying machine respectively. Harvesting bin and harvesting kit are being used by 22 (20%) and 7 (6%) farmers respectively. Other local technologies in the table are in use by one or two farmers each.

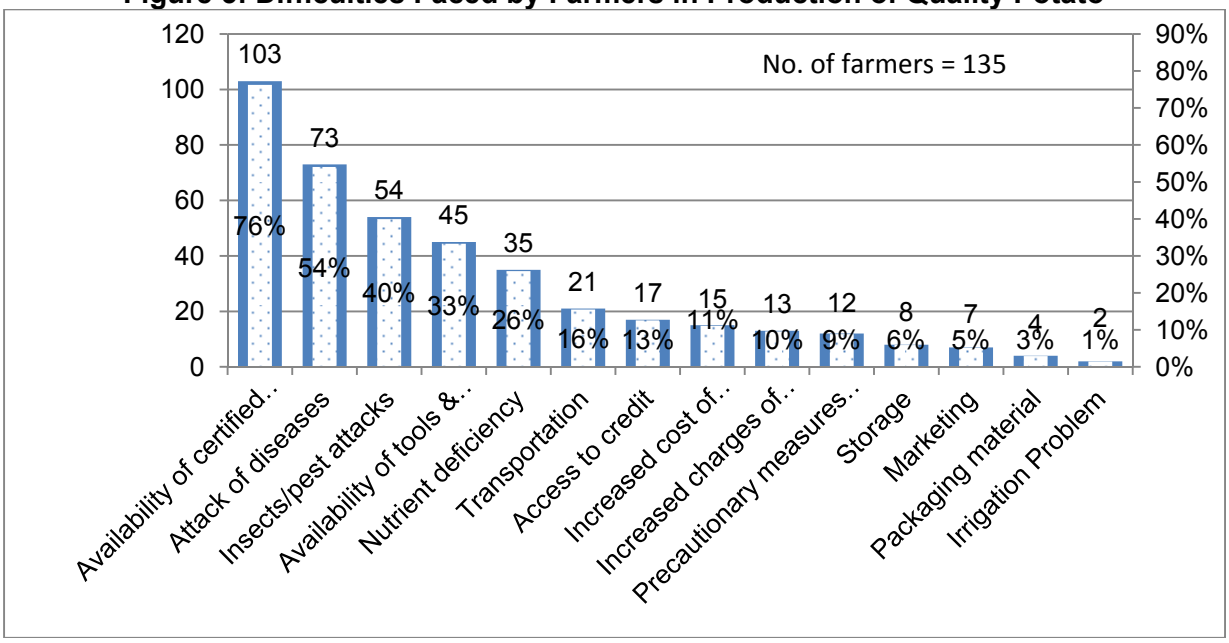
Figure 4: Distribution of Usage of Technology at Potato Farms



3.3.3. Difficulties Faced by Farmers in Production of Quality Potato

Due to far flung and difficult terrain of the area it was realized that farmers have lot of difficulties to produce quality potatoes. In order to rectify the situation, survey was undertaken to know their difficulties.A total of 135 farms were surveyed.In Figure5are arranged 14 major problems in descending order of their importance in the area. Out of 135 farmers 103 (76%) mentioned unavailability of certified seed as number one problem. Attack of diseases and insects were mentioned by 73 (54%) and 54 (40%) growers respectively. Availability of tools and machinery and nutrient deficiency were told by 45 (33%) and 35 (26%) respondents, respectively. Other problems in the figure express from 21 (16%) to 2 (1%) farmers, transportation being at the upper most and irrigation at the lowest ends.

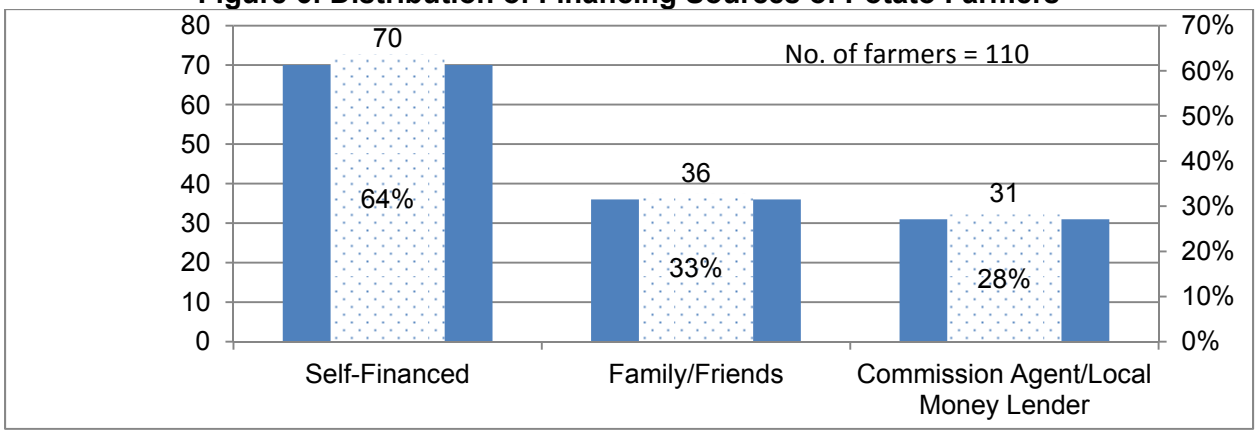
Figure 5: Difficulties Faced by Farmers in Production of Quality Potato



3.4. Financing Sources of Potato Farmers

Like all businesses availability of enough finances is essential for successful potato farming. Therefore the sources of financing were investigated from 110farmers. In Figure 6 different sources are listed: 70 (64%) and 36 (33%) farmers mentioned family/friends respectively. Another 31 (28%) took loans from Commission Agent/Local Money Lender. There seems a dire need to bring financial institutions with supervised credit facilities in the area as experience tells that supervised credit is utilized better than non-supervised ones.

Figure 6: Distribution of Financing Sources of Potato Farmers



3.4.1. Financial Requirements of Potato Farmers

All farmers were further probed to know their degree of satisfaction with their current financial arrangements and if they need further loans and the amounts needed. The results in Table 21 show that 44 (33%) farmers were satisfied with their available finances but91 (67%) reported that their present finances arrangements were not sufficient.

When farmers were asked about their consent for credit, 62 (68%) out of these 91 farmers said they want credit. While 29 (32%) said no as they believed that credit is not allowed in Islam.

Inquiries made from these 62 farmers reveal that credit amounts needed by 50 (81%) of them range from USD116 to 2,413. The highest demand above USD9,303 and up to 11,600 was from 2 (3%) farmers. As majority of farmers needed small amounts of credit, micro credit arrangements should be made.

Table 21:Potato Farmers Degree of Satisfaction with their Present Financial Arrangements, Their Willingness for Further Loans & Amount Requirements

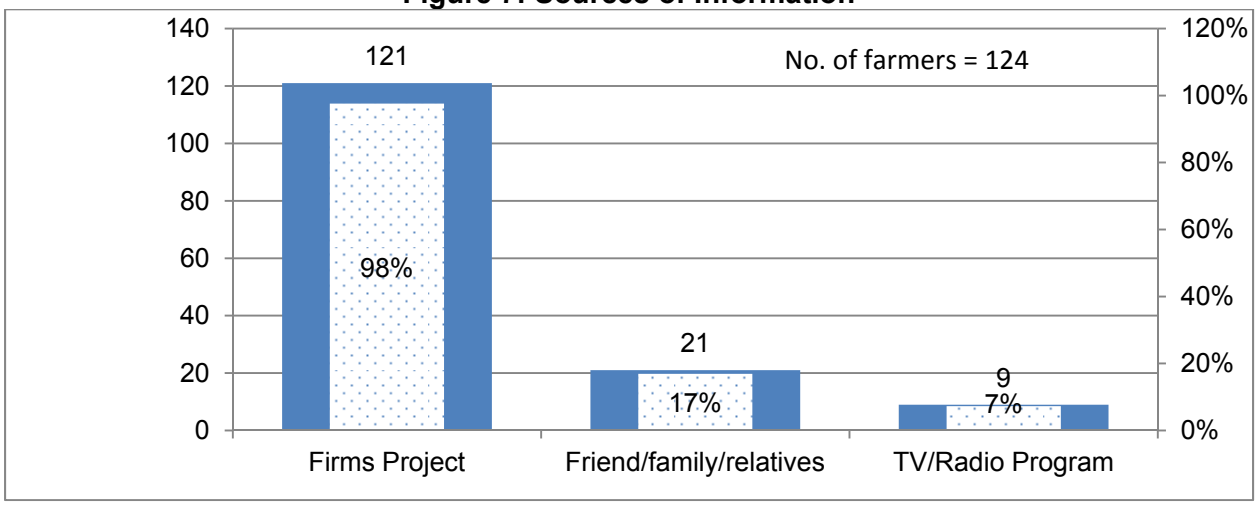
Satisfaction with Available Finances	Number of Farmers (n=135)	% of Farmers
Yes	44	32.6
No	91	67.4
Willingness for Credit	**Number of Farmers (n=91)**	**% of Farmers**
Yes	62	68.1
No	29	31.9
Required Amount of Credit	**No. of Farmers Respondent in each Category(n=62)**	**% of Farmers**
116.0-2412.8	50	80.6
2412.8-4709.6	7	11.3
4709.6-7006.4	2	3.2
7006.4-9303.2	1	1.6
9303.2-11600.0	2	3.2

3.5. Potato Farmers Degree of Information and Sources of Information

Farming science is developing rapidly creating new cultural techniques, cultivars, and production methods.Therefore to keep farming productive and compatible it is important that farmers should be well versed with the latest developments. When farmers were asked if they receive latest information, out of 135, 124 said yes, indicating that theywere in touch with new developments.

As majority of the farmers were informed, it was decided to know their sources of information.Figure7 shows that 121(98%) farmers were informed by Project, 21 (17%) mentioned family/friends, and 9 (7%) mentioned TV/radio as the sources. Contrary to general understanding,agriculture department and NGOs are not playing any major role in this regard.

Figure 7: Sources of Information

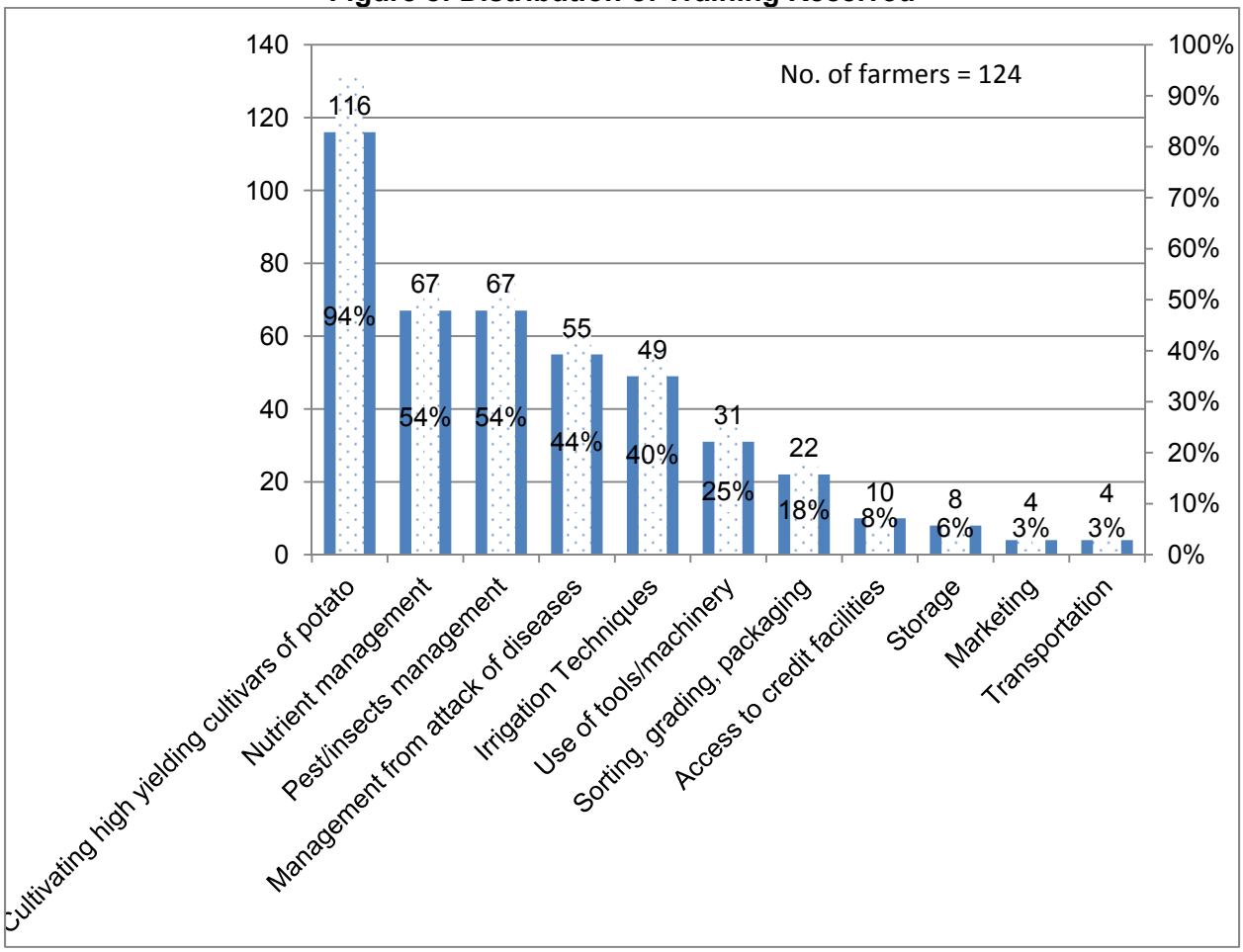


3.5.1. Types of Training Received by Potato Farmers

Training plays a major role in today's agriculture; therefore farmers were asked if they received some type of training. Figure8show 11 trainings received by 124 farmers. Most farmers 116 (94%) received training on the use of better cultivars, which explains the use of latest cultivars in the area. Trainings arranged in descending order show that 67 (54%) growers had trainings in nutrient and pest management each. Further results show that 55 (44%) and 49 (40%) farmers got trainings in disease control and improved irrigation techniques respectively. Other trainings were received from 31 (25%) to 4 (3%) farmers with use of tools and machinery at the upper most ends and marketing at the lowest one.

Few farmers received trainings on sorting, grading and packing, transportation, access to credit facilities, storage and marketing. There is need for arranging trainings in these areas.

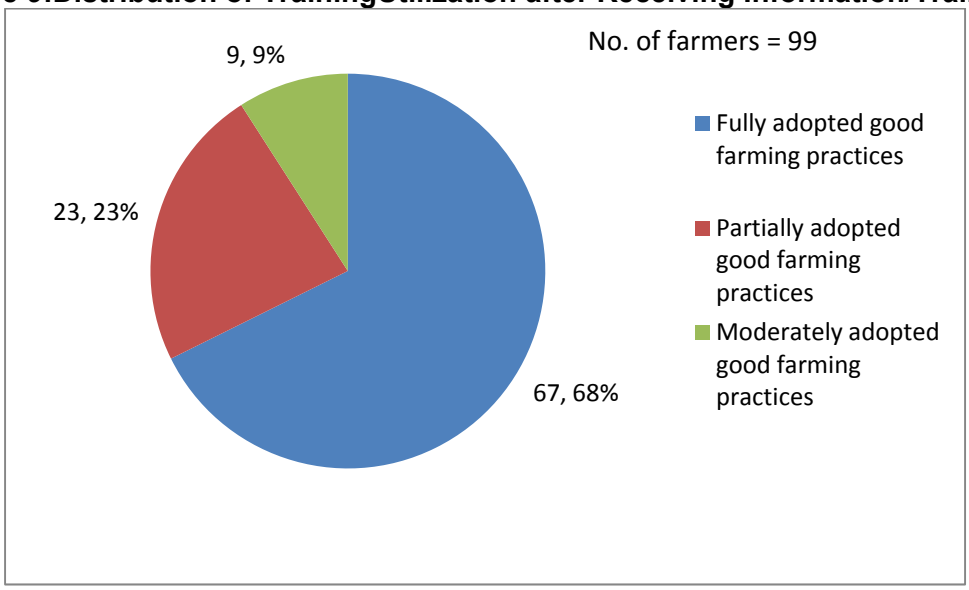
Figure 8: Distribution of Training Received



3.5.2. Scale of Training Utilization

Imparting training is of not much use if it is not utilized. Figure 9 show that out of 99 farmers, 67 (68%) and 23 (23%) adopted good farming practices learned in trainings fully and partially respectively.Adaptation by 9 (9%) farmers was moderate. Looking at the results,it can be safely said that adoption rate is very good.

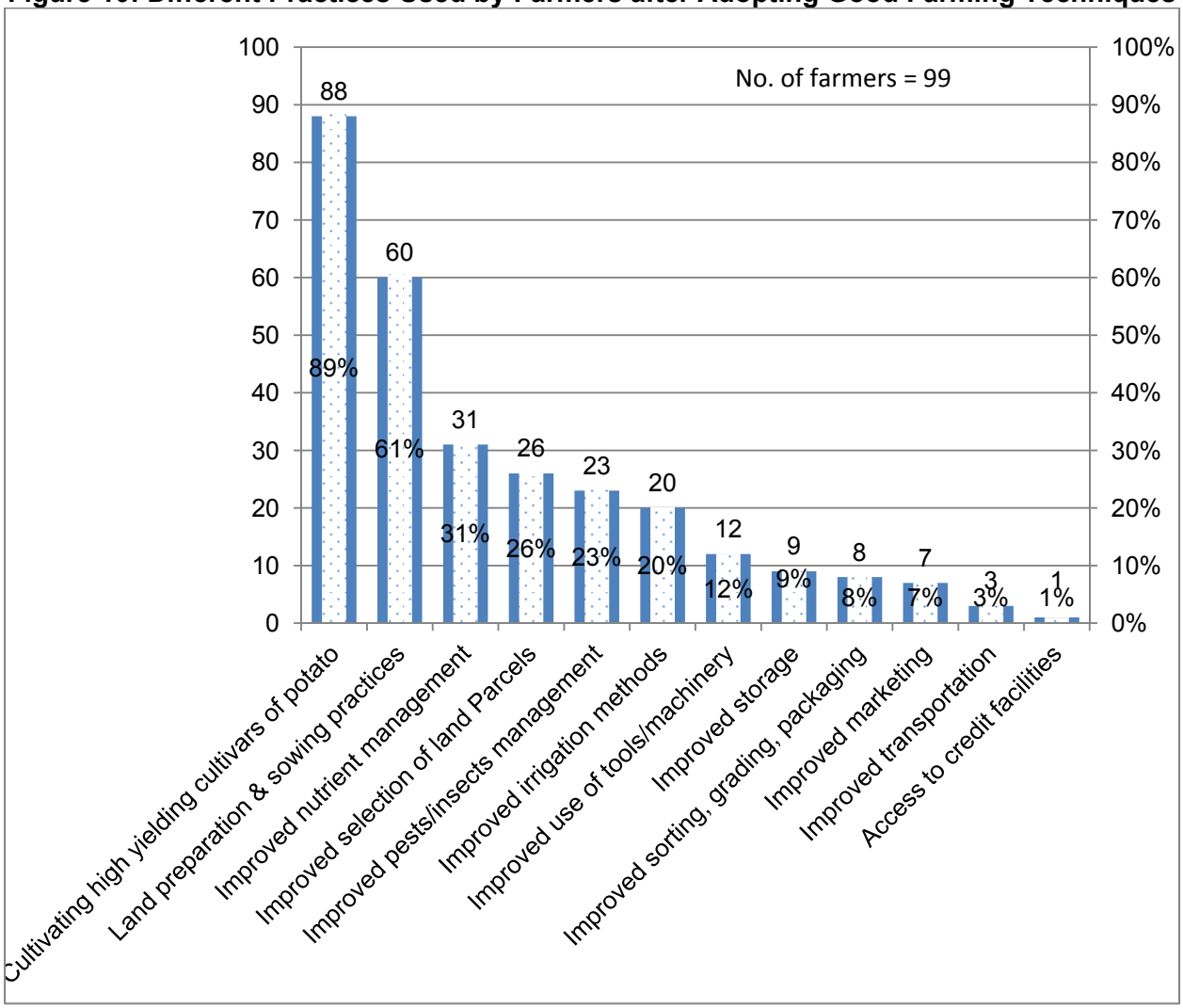
Figure 9:Distribution of TrainingUtilization after Receiving Information/Trainings



3.5.3. Improved Practices AdoptedAfter Training Received

Further probing was done to find out the most adopted practice as a result of the training. In Figure 10, out of 12 farming practices high yielding cultivar adoption came at the top as 88 (89%) farmers out of 99 reported that they have adopted it. Land preparation and sowing practices came at the second placewith 60 (61%) farmers. Improved nutrient management was adopted by 31 (31%) farmers. Other practices adopted by growers were between 26 (26%) and 1 (1%), with improved selection of land parcels to access to credit facilities at the upper most and the lowest ends respectively.Storage, grading and packing, improved marketing, transportation and access to credit facilities showed very poor or negligible adoption which may also be due to fact that these practices depend on external factors mostly beyond the control of farmers. Adoption rate indicates two facts; choice of the farmers and influence of external factors like unavailability. Negative effects of external factors show a weakness in overall system to be taken care of either by the Project or the government.

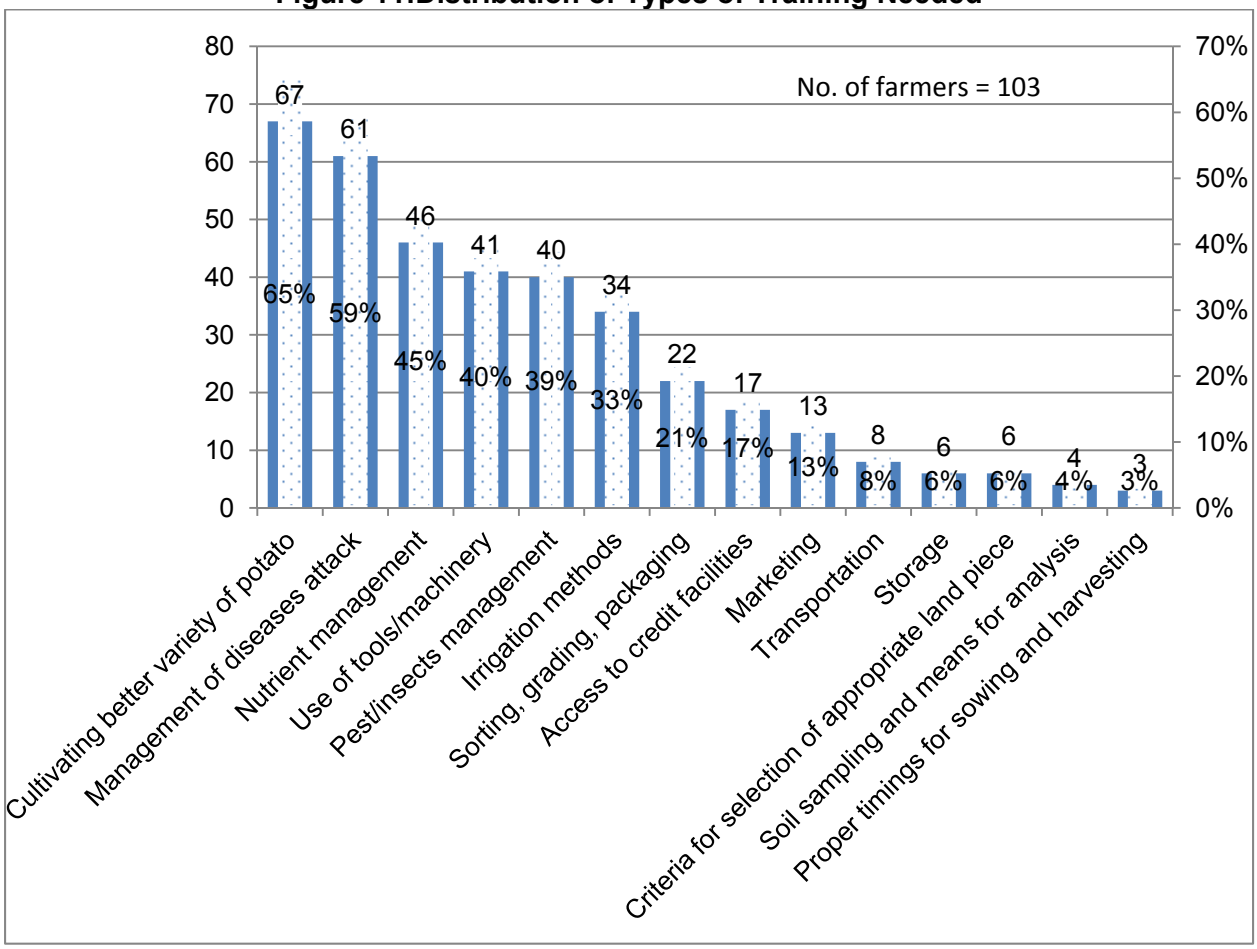
Figure 10: Different Practices Used by Farmers after Adopting Good Farming Techniques



3.5.4. Future TrainingNeeds of Potato Farmers

To improve the farming practices training and information play a pivotal role. When the farmers were asked if they need more training and information about farming practices,out of total 135,103 (76%) responded in positive.In other words training need assessment becomes necessary. In Figure 11 training types are identified. Out of 14 types listed in the table, training on cultivation of high yielding cultivars and disease control management were demanded by 67 (65%) and 61 (59%) farmers respectively out of a total of 103 farmers. Trainings on nutrient management and use of machinery were demanded by 46 (45%) and 41 (40%) farmers respectively. Trainings on pest management and irrigation methods were the needs shown by 40 (39%) and 34 (33%) farmers respectively. Other training needs were between 22 (21%) and 3 (3%), with sorting and packing at the highest and proper timings for sowing and harvesting at the lowest ends.

Figure 11:Distribution of Types of Training Needed

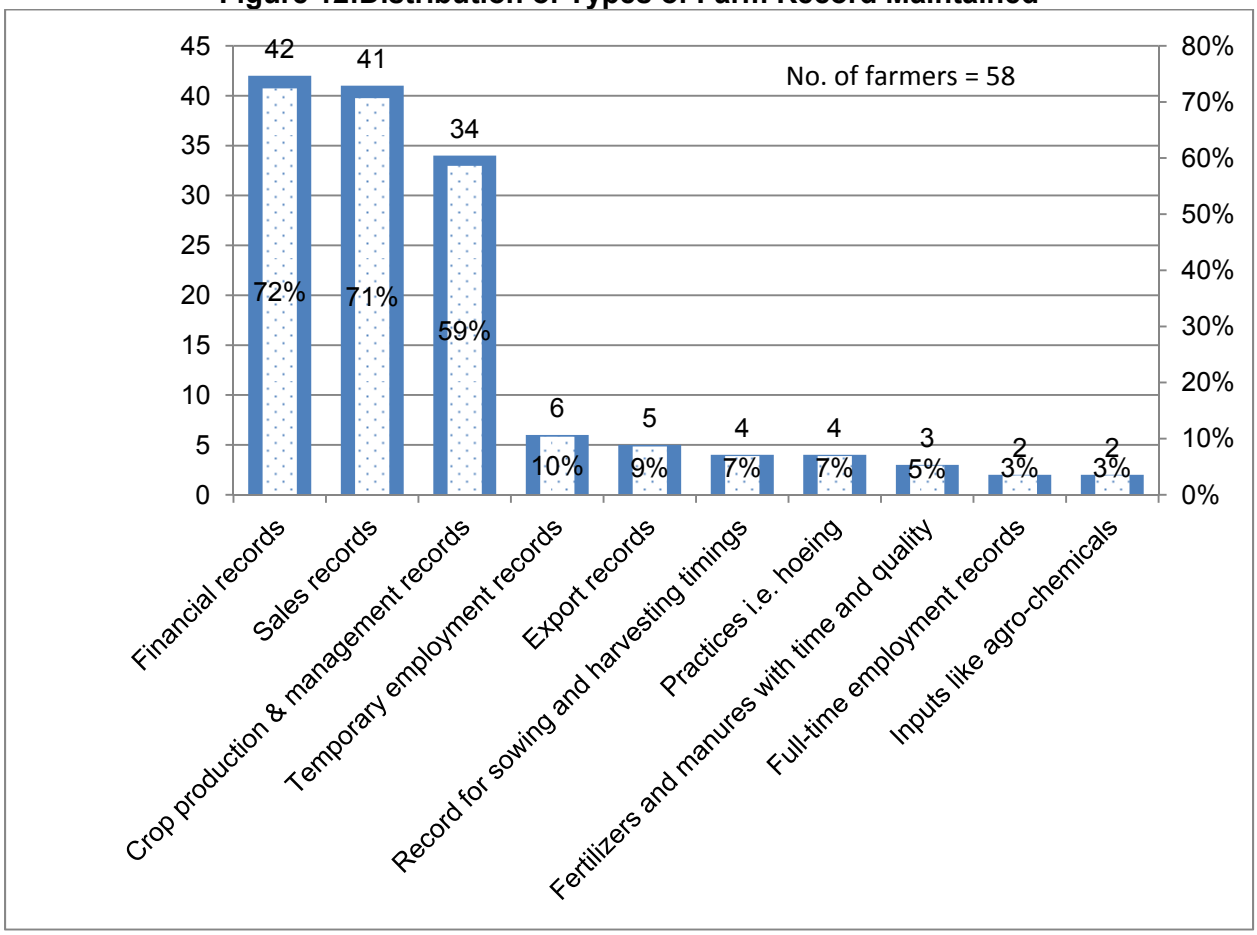


3.5.5. Maintenance of Farm Records by Potato Growers

Modern farming needs record keeping of all internal and external farm operations. Yield output in a certain year also depends on crops grown and cultural practices performed in the previous years. Therefore farmers were asked if they keep such records.

Out of 135 farmers interviewed,58 (43%) replied yes. Then it was found interesting to know from them the farm practices on which records are kept. Figure12shows 10 types of recordsmaintained at farms. Financial records were kept by 42 (72%) and sales records by 41 (71%) farmers. Crop production records were kept by 34 (58%) growers. Other records in the table were kept from 6 (10%) to 2 (3%) growers, temporary employment records and inputs records being at the highest and lowest ends respectively. Results show that most of the farmers are only interested in production,sales and financial records. Cultural practices records have no importance due to lack of awareness. It is recommended that trainings to create awareness should be arranged as yields directly depend on different cultural practices like crop rotations.Strangely enough none of farmers kept record on previous crops grown which shows their lack of awareness or interest for crop rotation system and its merits and demerits.

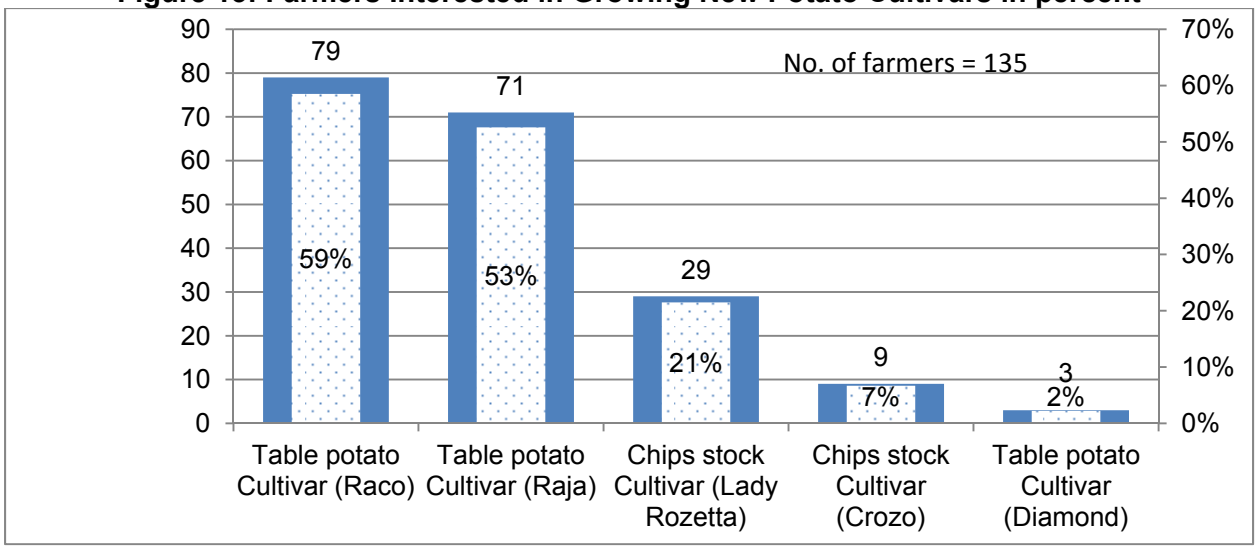
Figure 12:Distribution of Types of Farm Record Maintained



3.5.6. Potato Farmers Interest in New High Yielding Cultivars

The most important and the best finding came out as requirement of improved cultivars. In Figure 13 choice of 135 farmers is tabulated. Farmers gave priority to Roco; demanded by 79 (59%), Rajaby 71 (53%), and Lady Rozetta by 29 (21%). If we go back through the text these are the same cultivars grown by most of the farmers in the area. Only 9 (7%) and 3 (2%) demanded cultivars Crozo and Diamont respectively.

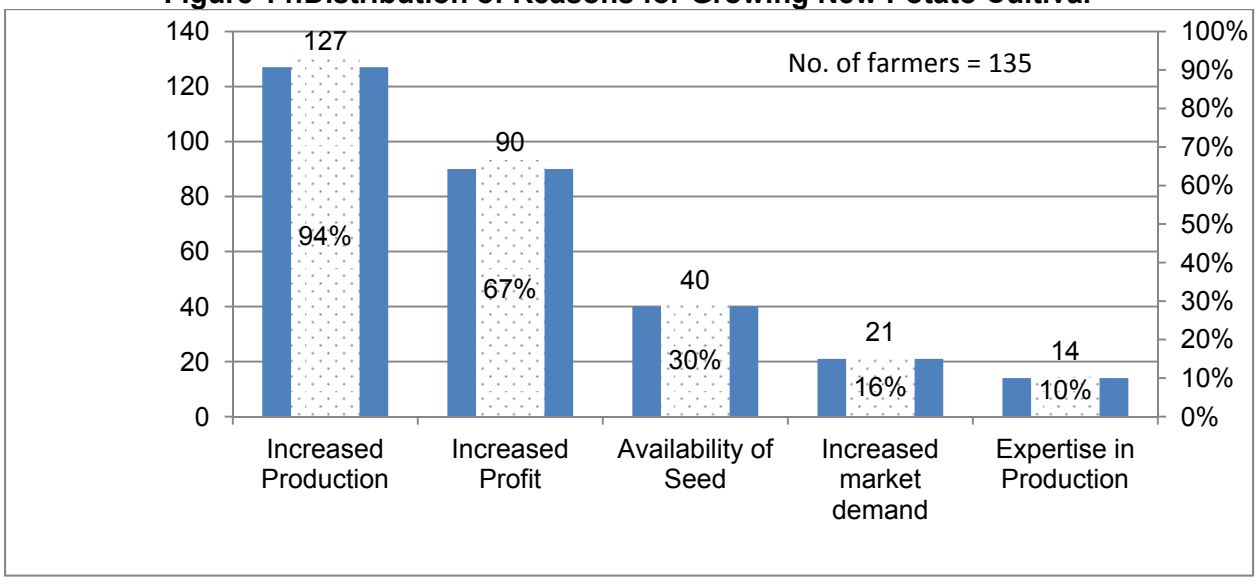
Figure 13: Farmers Interested in Growing New Potato Cultivars in percent



3.5.7. Reasons Given by Growers for Sowing New Cultivars

It was interesting to find out reasons for their choices. Results in Figure 14 show that out of 135 farmers, 127 (94%) and 90 (67%) pointed out increased production and increased profit. Farmers also gave the reason of availability of seed by40 (30%). Increased market demand and production expertise were mentioned by 21 (16%) and 14 (10%) farmers respectively.

Figure 14:Distribution of Reasons for Growing New Potato Cultivar



4. PEACH SURVEY FINDINGS

4.1. Basic Information of PeachOrchard

4.1.1. Types of Farm Ownership, Management and Source of Irrigation

Table 22showsthe status of ownership, management, and irrigation sourcesin Swat. Out of a total of 188 orchards a majority 159 (85%) wereself-cultivated and the rest 29 (15%) wereleased. As far as orchard management is concerned 185 (98%) wereself-managed and only 3 (2%) weremanaged by tenants. Tube wells and river/streams are the main irrigation sources irrigating 99 (53%) and 88 (47%) orchards respectively while only one orchard wasspring irrigated.

Table 22: Types of Farm Ownership, Management &Irrigation

Description	No. of Farmers Responded in each Category	% of Farmers Interviewed
Status of Ownership	(n=188)	
Self-cultivated	159	84.6
Leased	29	15.4
Status of Management	(n=188)	
Self-managed	185	98.4
Tenants	3	1.6
Source of Irrigation	(n=188)	
Tube well	99	52.7
River/Stream	88	46.8
Spring	1	0.5

4.1.2. Distance and Time Taken by Foot from Farm to Main Road

Marketing depends on time taken and distance of orchard to main road, particularly in hilly terrain. Table 23 shows that 113 (60%) orchards weresituated between 1 to 2 km of distance from the main road, 33 (18%) less than one km, 29 (15%) and 13 (7%) wereat 3 to 4 and more than 4 km distances respectively.

Besides distance from main road farmers were also asked to report time taken to reach the road. Their answers show that for 56 (30%) farmers it takes 11 to 20 minutes to reach the main road followed by 39 (21%) farmers who reach the road between in 21 to 30 minutes.

Table 23: Distance and Time Required by Foot to Reach from Farm to the Main Road

Description	No. of Farmers Responded in each Category	% of Farmers Interviewed
Distance	(n=188)	
< 1 KM	33	17.6
1-2 KMs	113	60.1
3-4 KMs	29	15.4
> 4 KMs	13	6.9
Time Required	(n=188)	
0-5 minutes	26	13.8
6-10 minutes	31	16.5
11-20 minutes	56	29.8
21-30 minutes	36	19.1
> 30 minutes	39	20.7

4.1.3. Landholding Size of Peach Orchards

Majority of farmers in Swat are small landholders. Landholding size in rural areas determines wealth and influence of the owner. Therefore, farmers interviewed about their acreage were classified into different categories presently used in Pakistan. Their responses in Table 24 show that a vast majority 158 (85%) weresmall farmers having up to 6 acres. Only26 farmers (14%) lie in medium farm category, which is up to 25 acres. Out of 185 farmers interviewed only one farmer had more than 25 acres (large category). A comparison between 2010 and 2011 showed almost no differences.

Table 24: Farms' Classification by Area with No. of Farmers in Each Category

Farm Category in Acres	2010		2011	
	No. of Farmers Responded in each Category	% of Farmers	No. of Farmers Responded in each Category	% of Farmers
Small (< 6)	158	85.4	157	84.9
Medium (6 – 25)	26	14.1	27	14.6
Large (>25)	1	0.5	1	0.5
Total	185	100	185	100

4.1.4. Number of Farmers with Different Cultivars, their Acreage and Trees

In our survey area, 10 peach cultivars were cultivated. We investigated farmers' preference for the cultivars and number of farmers planting a particular cultivar. The results are tabulated in Table 25 in descending order. Out of 185 farmers, 107 (58%) and 73 (40%) used cultivars No. 5 (NJC 84) and cultivars No. 8 (Indian Blood) respectively, followed by cultivar No. 6 (Elberta) and cultivar No. 7 (Maria Delezia) by 50 (27%) and 45 (24%) farmers respectively. Other cultivars listed in table were used only by 14% to 21% farmers. Reasons for higher preferences for certain cultivars were their higher yields and higher sale price. Low preference cultivars yield less and also fetch low price.A combination of factors like unavailability of better cultivars, financial constraints, low fertility and remotely situated lands, lack of technical know-how and family traditions compel a small minority of farmers to use low yielding cultivars.

Total acreage and total tree columns follow exactly the descending pattern reflecting the degree of preference for cultivars.

The same data for 2011 in Table 26 show no difference in any pattern, which was to be expected as orchard plantation is a multi-year culture.

Table 25: Farmers with Different Peach Cultivars, Their Acreage& No. of Trees in 2010

Peach Cultivars	No. of Farmers Responded in each Category	% of Farmers	Total Area in Acre	Total Trees	Average Trees per Acre
Trees of No.5 (Peach Cultivar NJC 84)	107	57.8	220.1	31,108	141
Trees of No.8 (Peach Cultivar Indian Blood)	73	39.5	169.0	25,129	149
Trees of No.6 (Peach Cultivar Elberta)	50	27.0	89.2	12,983	146
Trees of No.7 (Peach Cultivar Maria Delezia)	45	24.3	93.9	13,342	142
Trees of No.4 (Peach Cultivar Carmon)	39	21.1	67.9	10,355	153
Trees of early green Cultivar	34	18.4	57.8	7,985	138
Other Cultivars (i.e. Golden, Hartley, Sohani, Haljan)	26	14.1	69.6	9,288	133
Total	185		767.7	110,190	144

Table 26: Farmers with Different Peach Cultivars, their Acreage & No. of Trees in 2011

Peach Cultivars	No. of Farmers Responded in each Category	% of Farmers	Total Area in Acre	Total Trees	Average Trees per Acre
Trees of No.5 (Peach Cultivar NJC 84)	107	57.8	220.1	31,143	141
Trees of No.8 (Peach Cultivar Indian Blood)	74	40.0	170.01	25,619	151
Trees of No.6 (Peach Cultivar Elberta)	51	27.6	89.7	13,103	146
Trees of No.7 (Peach Cultivar Maria Delezia)	45	24.3	93.9	13,342	142
Trees of No.4 (Peach Cultivar Carmon)	39	21.1	67.9	10,375	153
Trees of early green Cultivar	34	18.4	57.8	7,960	138
Other Cultivars (i.e. Golden, Hartley, Sohani, Haljan)	25	13.5	70.6	9,138	129
Total	185		770.2	110,680	144

4.1.5. Major Peach Growing Tehsils in Swat District

Peach is mostly grown in three tehsils of Swat district. As it is one of the major crops in these tehsils, it was decided to collect and compare information among tehsils to know the order of suitability for peach gardening. Data in Table 27 show that 137 growers in 2010 were interviewed in all tehsils. In tehsil Barikot and Kabal 74 and 54 farmers were interviewed having 334and 240 acres of orchards with 11,818 and 8,144 kg per acre production respectively. In tehsil Babuzai only 9 farmers had 24 acres orchard with 10,074kg per acre fruit yield which shows that tehsil Barikot gave the highest average yield in 2010. When average production per acre from 2010 is compared with 2011, tehsil Barikot lacked behind other two tehsils. Number of respondents increased from 54 to 90 and from 9 to 19 in 2011 in Kabal and Babuzai tehsils respectively. Percent differences between years show 19% decrease in 2011 in Barikot, whereas 42% and 5% increases were registered in Kabal and Babuzai. These big differences forced us to look for reasons. In 2010 Kabal and Babuzai were severely affected by floods and 36 farmers' orchards were destroyed completely. The same happened to 10 orchards in Babuzai. Undestroyed orchards in both tehsils were negatively affected by floods giving lesser yield per acre. In 2011 adverse climatic conditions, mainly erratic precipitation, reduced per acre yield in Barikot. Results and reasons show that all tehsils are suitable for peach production under normal climatic conditions. A very small number of farmer have peach orchards in tehsil Babuzai if we compare with other two tehsils.

Table 27: Tehsil Wise Acreage & Production of Peach with No. of Farmers

Tehsil Name	2010				2011				% Changein Average Production Per Acre of Peach
	No. of Farmers Responded in each Category	Total Orchard Area in Acre	Total Production in Kg	Average Production Per Acre	No. of Farmers Responded in each Category	Total Orchard Area in Acre	Total Production in Kg	Average Production Per Acre	
Barikot	74	334.1	3,948,500	11,818.3	76	347.9	3,351,300	9,632.9	-18.5
Kabal	54	240.0	1,953,973	8,143.6	90	379.6	4,399,771	11,590.5	42.3
Babuzai	9	24.2	244,000	10,074.3	19	42.7	451,200	10,566.7	4.9
Total	137	598.3	6,146,473	10,278.4	185	770.2	8,202,271	10,649.5	3.7

4.1.6. Total Cost of Production

Farming has two main inputs: (i) material and (ii) labor. Detailed survey was conducted to know the types and cost of these inputs as farm productivity depends mainly on them. Besides these inputs, harvesting and post harvesting and marketing costs combined together with other costs give total cost of production.

Like all other enterprises costing factor in peach production was necessary to be calculated to arrive at the cost-benefit balance. In Table 28 production and marketing cost analysis is presented. Total cost is segregated into input costs, harvesting and post harvesting, and miscellaneous costs for the years 2010 and 2011.Number of farmers interviewed in both years is almost same. Material cost was borne by all 185 farmers. Permanent labor was hired only by 9and 7 farmers in 2010 and 2011 respectively. The corresponding numbers for hiring temporary labor were 180 and 182 and those for family labor were 18 and 24, showing that temporary labor is employed in the highest numbers to cover peak operations like hoeing, pruning, spraying etc. Total input cost per acre was USD327 and 409in 2010 and 2011 respectively. Cost difference in years is due toacreage differences. A comparison between components of input and harvesting and post harvesting costs showed almost the same trend. The most interesting thing is that per acre cost of harvesting and post harvesting increased by 14% in 2011 respectively over the corresponding cost of inputs. Miscellaneous costs showed no differences between the years. Total per acre cost of production and marketing increased from USD819 to 1,142 (39% rise) in 2011 which reflects general inflation rate in Pakistan.

Table 28: Total & Average per Acre Production and Marketing Cost of Peach

Description	2010				2011			
	No. of Farmers Responded in each Category	Total Cost in USD	Total Orchard Area in Acres	Average Cost Per Acre in USD	No. of Farmers Responded in each Category	Total Cost in USD	Total Orchard Area in Acres	Average Cost Per Acre in USD
A- Total Input Cost								
Material Cost	185	200,117.4	767.8	260.6	185	240,570.7	770.2	312.3
Permanent Labor	9	11,070.5	66.5	166.5	7	16,324.7	51.2	319.1
Temporary Labor	180	39,008.2	740.1	52.7	182	57,189.7	757.4	75.5
Family Labor	18	1,103.3	71.9	15.3	24	1,410.6	90.7	15.6
Total	185	251,299.4	767.8	327.3	185	315,495.6	770.2	409.6
B- Total Harvesting and Post Harvesting Cost								
Material Cost	88	152418.9	357.0	427.2	124	238497.1	487.0	489.9
Permanent Labor	2	179.0	7.0	24.1	3	2644.8	15.0	178.4
Temporary Labor	87	112048.7	353.0	317.5	123	172835.8	483.0	358.0
Family Labor	3	524.2	25.0	20.8	4	268.0	11.0	24.7
Total	88	266781.9	357.0	747.7	124	414245.6	487.0	851.0
C- Miscellaneous								
Transportation, Munshiana (Market Record Keeping Charges), Market Fees, Commission etc.	87	110,289.5	353.0	312.6	123	149,479.4	483.0	309.6
Total Cost of Production and Marketing (A+B+C)	**185**	**628,370.8**	**767**	**819.3**	**185**	**879,220.6**	**770**	**1,141.8**

4.2. Farm Employment Details

As farm employment is an important component of peach production, it was decided to study this in details. In Table 29 in 2010, 183 (99%) farmers out of total 185 interviewed said that they

employed temporary labor in peak working days. Only 9 (5%) and 49 (27%) farmers respectively had permanent and family labor.Coming to total days per year it is noted thattemporary labor in 10,161 days averaged at 13 days per acre. It is followed by permanent labor with 1,072 days and family labor with 1,073 days averaging 16 and 6 days per acre respectively.The facts show the importance of peach gardening for temporary farm labor in the area as alternativesources of employment are extremely few. It can be safely said that peach gardening plays a pivotal role in the local economy. The corresponding values for 2011 in Table 30 show exactly the same trend.

Table 29: Total & Average Per Acre Farm Employment Days in Different Labor Categories in 2010

Labor Category	No. of Farmers Responded in each Category	% of farmers	Total Employed Labor	Total Days	Average Days Per Acre
Permanent	9	5	157	1,072	16
Temporary	183	99	7,021	10,161	13
Family	49	27.2	165	1,073	6
Total	185		7,343	12,306	

Table 30: Total & Average per Acre Farm Employment Days in Different Labor Categories in 2011

Labor Category	No. of Farmers Responded in each Category	% of farmers	Total Employed Labor	Total Days	Average Days Per Acre
Permanent	8	4.3	155	1,070	18
Temporary	183	99.5	8,551	11,447	15
Family	50	27	179	834	5
Total	185		8,885	13,351	

4.2.1. Cost of Labor Employed in Peach Orchards

The data above have shown that peach orchards are a major source of farm labor employment in Swat. It was thus tried to probe the total cost incurred on labor which is also a direct financial contribution to the local economy. In Table 31 in 2010, total cost is USD297,727 split into permanent, temporary and family labor along with their numbers and number of employers is also present for details. Corresponding values and details for 2011 are in Table 32. In this year total cost increased to USD392,877, up by 32%. In 2011 cost increased for permanent and temporary labor partially due to increase in labor charges and labor numbers, a normal trend. This normal trend showed a reversal in family labor when corresponding columns of labor number, total cost or average cost per acre are compared from both years. In 2011 family labor numbers increased from 165 to 179, an increase of 9%.In spite of this increase total cost was decreased by 12%, from USD10,324 to 9,096. On this abnormal situation the employers said new laborers who worked for the first time in this year demanded lesser wages.

Table 31: Total & Average per Acre Cost of Labor in Different Labor Categories in 2010

Labor Category	No. of Farmers Responded in each Category	Total Employed Labor	Total Cultivated Area in Acres	Total Employment Cost in USD	Average Employment Cost Per Acre in USD
Permanent	9	157	66.5	12,860.6	193.5
Temporary	182	7,021	750.0	274,290.0	365.7
Family	49	165	172.7	10,324.2	59.8
Total	185	7,343	767.8	297,727.6	

Table 32: Total & Average per Acre Cost of Labor in Different Labor Categories in 2011

Labor Category	No. of Farmers Responded in each Category	Total Employed Labor	Total Cultivated Area in Acres	Total Employment Cost in USD	Average Employment Cost Per Acre in USD
Permanent	8	155	58.6	18,969.5	323.9
Temporary	183	8,551	762.3	364,560.8	478.2
Family	50	179	176.4	9,096.7	51.6
Total	185	8,885	770.2	392,877.5	

4.2.2. Details of Working Days of Labor in Peach Orchards

As a major employment source for locals, labor is one of the most important inputs in peach farming. Therefore, total number of laborers employed in each category per year with total work days in a year and average work days per year for 2010 and 2011 are tabulated in Table 33. Data in the table for 2010 show that in permanent category 157 laborers were employedand worked for 3,437 input days on 67 acres of orchard with average 22 input days. The same values for temporary labor are 7,021input days on750 acres with 8 input days per year. A total of 165 family laborers worked for 1,486 input days in total on 173 acres. Corresponding values in 2011 showed the same trend and gave almost similar results.

Table 33:Different Labor Categories Employment Status on Peach Farms

Year	Permanent			Temporary			Family		
	Total No. of Labors worked on Acres(--)	Total No. of Input Days Worked	Average Days Worked in a Year	Total No. of Labors Worked on Acres (--)	Total No. of Input Days Worked	Average Days Worked in a Year	Total No. of Labors Worked on Acres(--)	Total No. of Input Days Worked	Average Days Worked in a Year
2010	157(67)	3,437	21.89	7021(750)	54,485	7.76	165(173)	1,486	9.01
2011	155(59)	3,334	21.51	8551(762)	57,729	6.75	179(176)	1,352	7.55

4.2.3. Full Time Equivalent (FTE) for All Labor Categories

In Table 34 with the same number of laborers in each category average working days per month and average working hours per day are given for 2010. A look at the table shows that permanent laborers worked 22 days per year, whereas temporary and family laborers worked for 8 and 9 days per year respectively. Interestingly all types of laborers on averageworked for 7 hours per day. In the same table Full Time Equivalent (FTE) job for all labor categories is calculated by using the formula given in the table. FTE for permanent labor is 12 and for temporary and family labor the values are 189 and 5 respectively.

The corresponding values for 2011 are in Table 35 show the same trend with almost comparable values with minor deviations due to yearly change.

It was strange to find out that women do not work in peach orchards, whereas they do work in potato production.

Table 34:Employment Figures in Peach Farms in 2010

Total Number of employees			Average Working Days/Year*			Average Working Hours/Day		
Permanent	Temporary	Family	Permanent	Temporary	Family	Permanent	Temporary	Family
157	7021	165	21.89	7.76	9.01	7.2	7.2	7.2
* Average working days per year = total input days / no. of laborers								

Full Time Equivalent (FTE) for Year**				Full Time Equivalent (FTE) Per Acre**			
Permanent	Temporary	Family	Total	Permanent	Temporary	Family	Total
11.9	188.59	5.15	205.64	0.18	0.25	0.03	0.21
* FTE = (# of employee * average working days per month*average working hours) / 2080				*** FTE = (Full Time Equivalent for year / Corresponding acres			

Table 35:Employment Figures in Peach Farms in 2011

Total Number of employees			Average Working Days / Year*			Average Working Hours / Day		
Permanent	Temporary	Family	Permanent	Temporary	Family	Permanent	Temporary	Family
155	8551	179	21.51	6.75	7.55	7.2	7.2	7.2
* Average working days per year = total input days / no. of laborers								

Full Time Equivalent (FTE) for Year**				Full Time Equivalent (FTE) Per Acre***			
Permanent	Temporary	Family	Total	Permanent	Temporary	Family	Total
11.54	199.80	4.68	216.02	0.19	0.26	0.03	0.22
**FTE = (# of employee * average working days per month*average working hours) / 2080				*** FTE = (Full Time Equivalent for year / Corresponding acres			

4.3. Sale and Income Values of Peach Growers

As sale and income is the final target of any business, 188 peach farmers were interviewed to collect their sales and income data for 2010 and 2011. InTable 36 sales values collected in 2010 are tabulated. Out of the total sample,42 farmers (22%) reported complete orchard destruction due to floods while 2 (1%) reported destruction due to snowfalland reported no production. Of the interviewed farmers, 4 (2%) mentioned no fruit bearing because of shortage of water as their broken tube well could not be repaired in the season.Farmers that had no peach plantation were 3(1.6%).

Farmers who sold their fruits are placedin different sale categories. From this sample 86 (63%)farmers sold peaches in theUSD292 to 7,254category while 33 (24%) fell in the second category from USD7,254 to 14,215.In addition 3 farmers (2%) earned the highest sale price – USD28,138 to 35,100. The rest of the 15 surveyed farmers fell in the range of USD14,215 to 28,138.

In Table 37 values of net income earned are classified, scenario of no sale is the same as in Table 36 i.e. 42 (22%) farmers suffered losses. Further probing revealed the following reasons for loss:

- Fruit spoilage because of nutrient deficiency resulting in bad quality fruit fetching very low rate.
- Lack of finances to buy inputs necessary for healthy successful crop.
- Unavailability of fertilizers at the right time.
- Not proper and in time harvesting due to lack of appropriate know-how.

Income data show that earnings of 82 (73%) growers were in the lowest category from USD110 to 6,085. After this 21 (19%) farmers fell in the next lowest category from USD6,085 to 12,059. Only one farmer earned the highamount of USD29,982.

Table 36:Peach Farmers' Status in Different Sales Categories in 2010

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers who Sold Production (n=137)	Total Orchard Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
Flood Destruction	42	22.3	-	-	148.8	-	-
Destruction due to snow fall	2	1.1	-	-	9.4	-	-
Fruit didn't Bear	4	2.1	-	-	11.4	-	-
No Peach Plantation	3	1.6	-	-	-	-	-
292.5-7,254.0	86	45.7	3,122,540	62.8	278.5	328,220.1	1,178.5
7,254.0-14,215.5	33	17.6	1,489,533	24.1	165.6	341,955.9	2,065.0
14,215.5 -21,177.0	9	4.8	439,400	6.6	46.5	147,303.0	3,167.8

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers who Sold Production (n=137)	Total Orchard Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
21,177.0 - 28,138.5	6	3.2	640,000	4.4	50.9	140,452.7	2,759.4
28,138.5 -35,100.0	3	1.6	455,000	2.2	56.8	98,280.0	1,730.3
Total	188	100	6,146,473	100	598.3	1,056,211.7	1,765.4

Table 37:Peach Farmers'Status in Different Income Categories in 2010

Income Groups	No. of Farmers Responded in each Category	% of Farmers	% of Farmers who Get Profit (n = 112)	Total Orchard Area in Acre	Total Income in USD	Average Income Per Acre in USD
Flood Destruction	42	22.3	-		-	-
Destruction due to snow fall	2	1.1	-	-	-	-
Fruit didn't Bear	4	2.1	-	-	-	-
No Peach Plantation	3	1.6	-	-	-	-
Financial Loss	25	13.3	-	108	-35,783.3	-330.6
110.0-6,084.5	82	43.6	73.2	290	211,503.5	730.3
6,084.5 -12,059.0	21	11.2	18.8	115	185,404.4	1,617.0
12,059.0 -18,033.4	6	3.2	5.4	48	92,562.7	1,930.8
18,033.5 -24,007.9	2	1.1	1.8	15	38,229.8	2,548.7
24,007.9-29,982.4	1	0.5	0.9	30	29,982.4	1,011.1
Total	188	100	100	497	557,682.8	1,122.8

Note: Value in minus represent financial losses incurred by orchards growers

Corresponding values of Tables 36 and 37 for 2011 are in Tables 38 and 39 respectively. In Table 38as one farmer had very poor yield (250 kg), he did not sell and kept for self-consumption and as gifts for relatives and friends. A few farmers, 3 (1.6%), had no orchard plantations.

Data show that 129 (70%) farmers sold in the lowest sales category of USD255 to 9774. Another 40 (21%) fell in the next lowest category of USD9,774 to 19,293. Only one farmergot the highest sale amount of USD47,850.

Net earnings amounts are in Table 39. As one farmer did not sell,3 had no plantations and 33 (18%) suffered losses due to reasons given in Table 36.

Out of the total 151 farmers,123 (82%) were in the lowest income category of USD88 to 7,544. In the next earning category of USD7,544 to 14,999, there were 26 (17%) farmers, while one farmer earned the highest amount of USD29,909.

Table 38:Peach Farmer's Status in Different Sale Categories in 2011

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers Who Sold Production (n=184)	Total Orchard Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
Didn't sell (for own use)	1	0.5	250	-	1.5	-	-
No Peach Plantation	3	1.6	-	-	-	-	-
255.2-9774.1	129	68.6	3,548,210	70.1	409.5	624,950.0	1,526.3
9,774.2- 19,293.1	40	21.3	3,127,611	21.7	221.9	538,553.2	2,427.0
19,293.1-28,812.1	7	3.7	448,500	3.8	45.5	167,852.0	3,691.6
28,812.1-38,331.0	7	3.7	857,200	3.8	74.6	231,507.0	3,102.2

Sales Groups	No. of Farmers Responded in each Category	% of Farmers	Total Production in Kg	% of Farmers Who Sold Production (n=184)	Total Orchard Area in Acre	Total Sales in USD	Average Sales Per Acre in USD
38,331.1- 47,850.0	1	0.5	220,500	0.5	17.3	47,850.0	2,766.3
Total	188	100	8,202,271	100	768.8	1,610,712.2	2,095.2

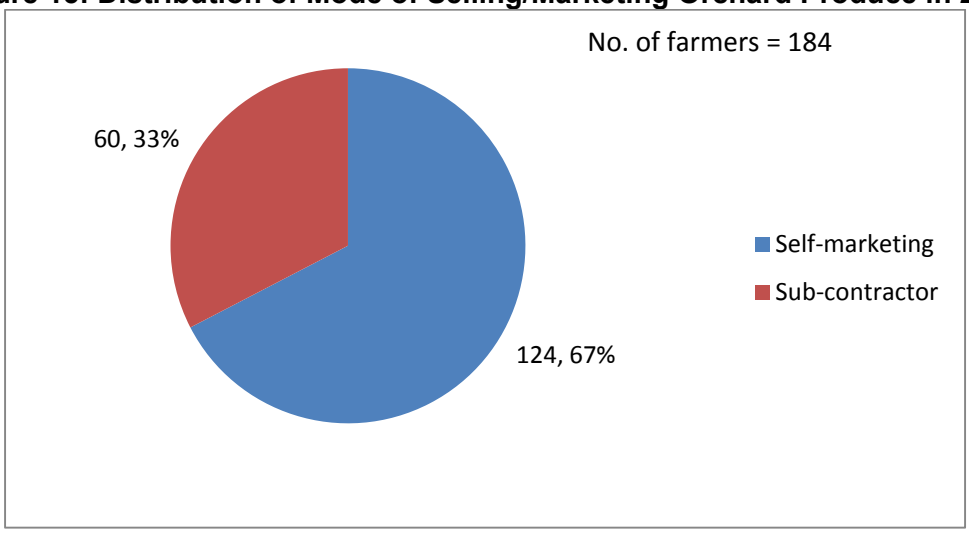
Table 39: Peach Farmer's Status in Different Income Categories in 2011

Income Groups	No. of Farmers Responded in each Category	% of Farmers	% of Farmers Who Get Profit (n = 151)	Total Orchard Area in Acre	Total Income in USD	Average Income Per Acre in USD
Didn't sell (for own use)	1	0.5	-	-	-	-
No Peach Plantation	3	1.6	-	-	-	-
Financial Loss	33	17.6	-	108	-50,090.5	-464.9
88.2 -7,543.6	123	65.4	81.5	493	326,092.5	661.8
7,543.6-14,998.9	26	13.8	17.2	147	267,841.1	1,824.7
14,999.0 -22,454.3	1	0.5	0.7	5	16,524.2	3,343.5
22,454.3 -29,909.7	1	0.5	0.7	17	29,909.7	1,729.1
Total	188	100	100	661	640,367.6	968.4

4.3.1. Channels of Marketing Adopted by Peach Producers

Farmers use different channels for marketing depending on their suitability and availability for them. Different marketing channels also affect sale price and profit, which shows their importance in the farming system. Survey results on marketing channels in Figure 15 show that out of 184 farmers, 124 (67%) did self-marketing, whereas only 60 (33%) used the services of sub-contractor.

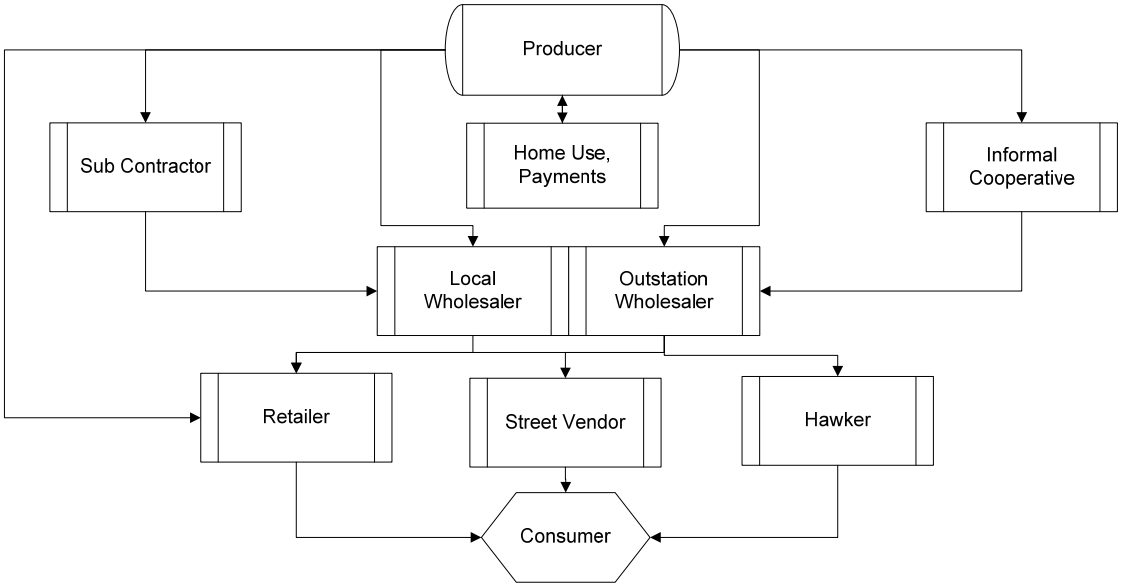
Figure 15: Distribution of Mode of Selling/Marketing Orchard Produce in 2011



Farmres frequently used method of self-marketing to sell their production to local and outstation wholesaler. Wholeseller sold production to retailers and consumer purchased potato from retailers.

Farmres frequently used method of self-marketing to sell their production to local and outstation wholesaler. Wholeseller sold production to retailers and consumer purchased peach from retailers.

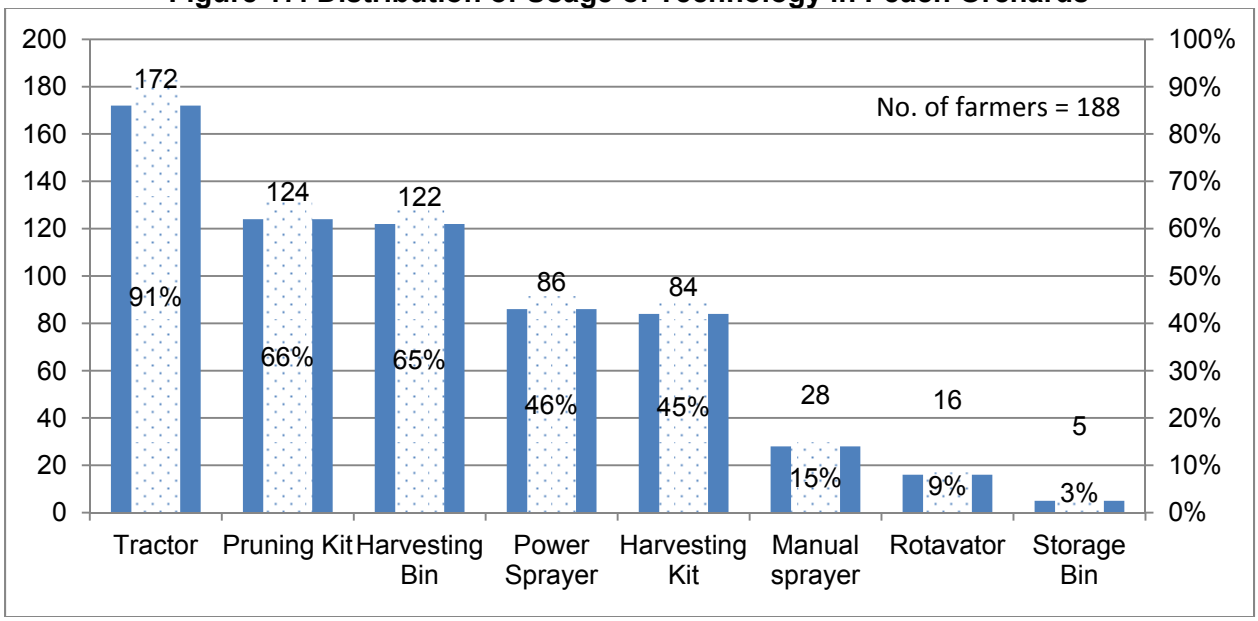
Figure 16: Marketing Channel of Peach



4.3.2. Usage of Technology in Peach Production

A delicate crop peach needs proper technology and care. Moreover today's agriculture is not profitable if appropriate technology is not used.Therefore188 farmers were surveyed for their use of different technologies. In Figure 17, out of a list of 8 technologies prevalent in the area, 172 (91%) farmers used tractors, 124 (66%) pruning kits, 122 (65%) harvesting bins, 86 (46%) power sprayers, and 84 (45%) harvesting kits. Other technologies in the table were used only by few farmers. Storage bin is at the lowest end used only by 5 (3%) farmers.

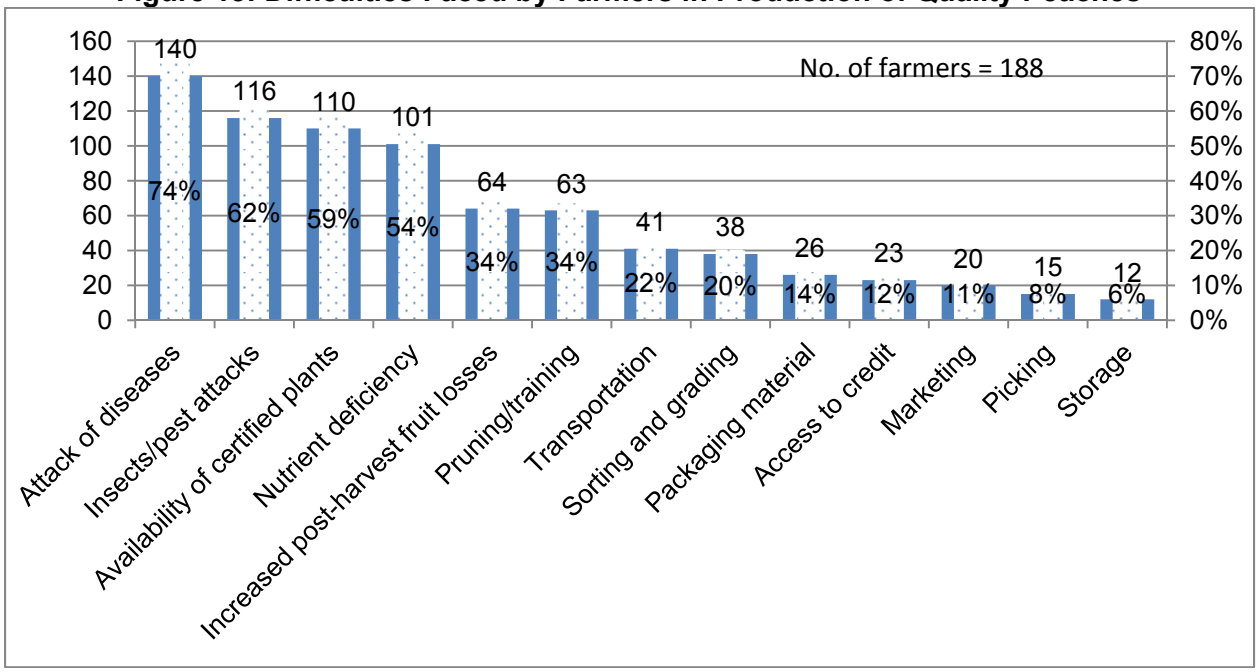
Figure 17: Distribution of Usage of Technology in Peach Orchards



4.3.3. Difficulties Faced by Peach Farmers in Production of Quality Peaches

Peach growers face a lot of problems because of difficult terrain. Farmers were surveyed to rank the most pressing problems out of a possible list of 13 commonly reported problems in the area. Results are tabulated in descending order in Figure 18. Out of the 188 strong sample, 140 (74%) farmers mentioned attack of diseases, followed by 116 (62%) who mentioned pest attack while third most pressing problem reported by 110 (59%) was unavailability of certified plants. Nutrient deficiency was mentioned by 101 (54%).Post-harvest losses and pruning/training problems were indicated by 34% each. Other problems in the table were mentioned by lesser percentage of farmers. Picking and storage came at the lowest end indicated by 15 (8%) and 12 (6%) farmers respectively.

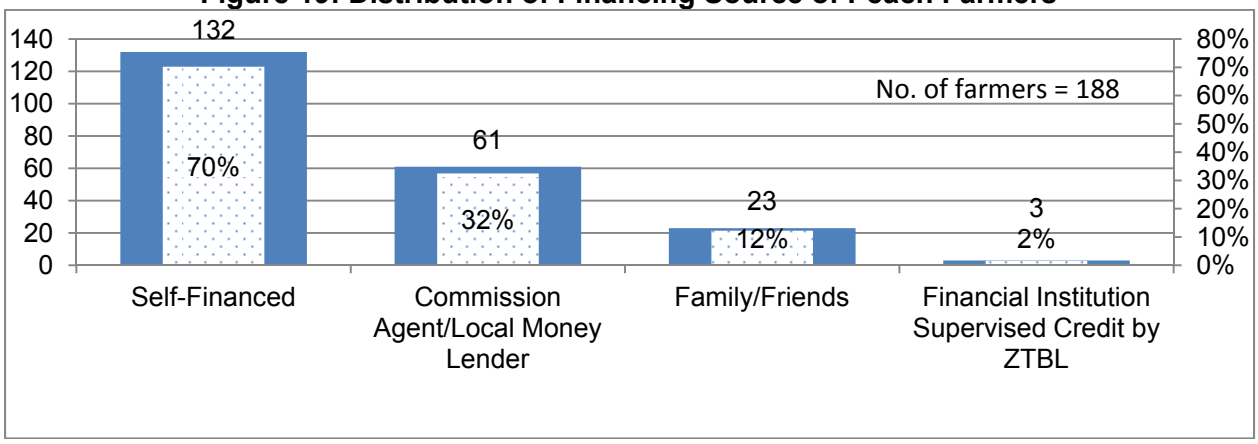
Figure 18: Difficulties Faced by Farmers in Production of Quality Peaches



4.4. Financing Sources of Peach Farmers

Like all businesses availability of enough finances is essential for successful orchard.In Figure 19 different sources are listed: 132 (70%) and 61 (32%) farmers mentioned self-financing and loans from commission agent/local money lenderrespectively. Another 23 (12%) took loans from family and friends. Only 3 (2%) farmers took credit from financial institution (ZTBL) which shows that these institutions are not active enough in the area. There is a dire need to bring financial institutions with supervised credit facilities in the area.Experience tells that supervised credit is utilized better than non-supervised ones.

Figure 19: Distribution of Financing Source of Peach Farmers



4.4.1. Financial Requirements of Peach Farmers

The same 188 farmers were further probed to know their degree of satisfaction with their current financial arrangements and if they need further loans and the amounts needed.The results in Table 40 show that 108 (57%) farmers are satisfied with their available finances.But 80 (43%) farmers reported that their present finances arrangementswere not sufficient. When asked about their consent for credit, 60 (75%) out of these 80 farmers said they want credit. While 20 (25%) said no as they believed that credit is not allowed in Islam. Inquiries made from these 60 farmers reveal that credit amounts needed by 32 (52%) range from USD116 to 2,876. Further 16 (27%) farmers need credit in the USD2,876 to5,637 and another 10 (17%) in the USD5,637to8,398 range.The highest demand above USD8,398 and up to 13,920 was from 3% farmers. As majority of farmers needed small amounts of credit, micro credit arrangements should be made.

Table 40:Peach Farmers Degree of Satisfaction with their Present Financial Arrangements, Their willingness for further Loans & Amount Requirements

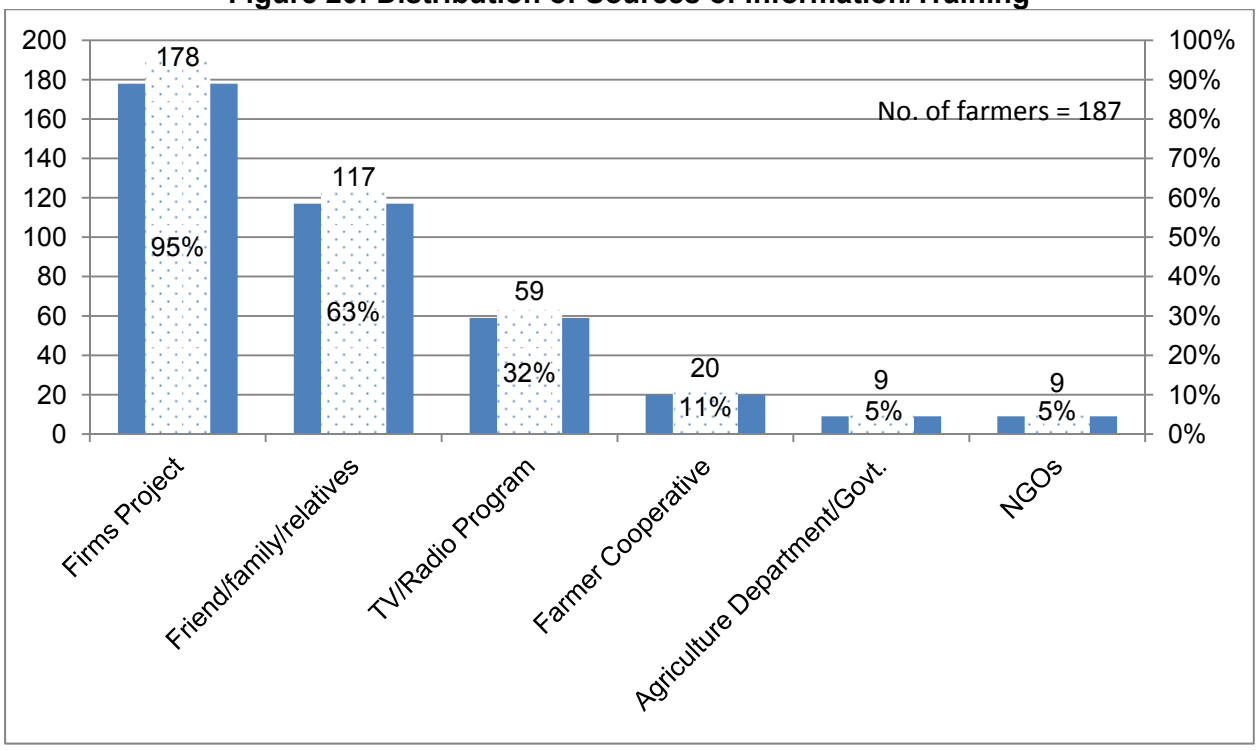
Satisfaction with Available Finances	**Number of Farmers (n=188)**	**% of Farmers**
Yes	108	57.4
No	80	42.6
Willingness for Credit	**Number of Farmers(n=80)**	**% of Farmers**
Yes	60	75.0
No	20	25.0
Required Amount of Credit	**No. of Farmers Respondent in each Category**	**% of Farmers**
116.0-2,876.8	32	53.3
2,876.8-5,637.6	16	26.7
5,637.6-8,398.4	10	16.7
8,398.4-11,159.2	1	1.7
11,159.2-13,920.0	1	1.7
Total	60	100.0

4.5. Peach Orcharders Degree of Information and Sources of Information

Latest information about farming techniques and markets situation is important for profitable agriculture in general and for orchards in particular. Out of 188 farmers interviewed, all but one said that they had received information.Their responses in Figure 20 show that 178 (95%)farmers received information from the Project, 117 (63%) from friends and relatives and

32% from TV and radio. Cooperatives, agriculture department and NGOs provided information only to small percentage ranging from 5% to 11%.

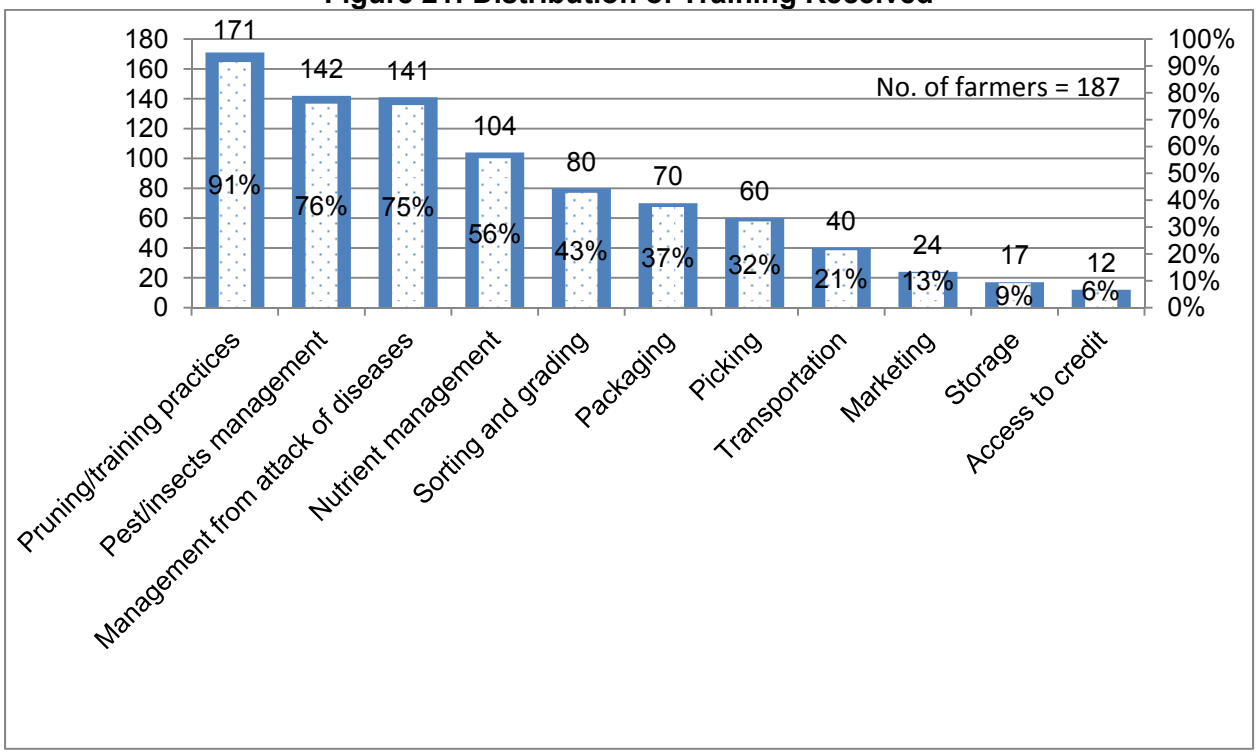
Figure 20: Distribution of Sources of Information/Training



4.5.1. Types of Trainings Received by Peach Orcharders

Due to research in agriculture, farming practices are being continuously improved. Improved farming practices can only be adopted by farmers if they receive proper training from outreach agencies. A total of 187 farmers were interviewed to know the types of training they received in 2011. Out of the 11 types of training mentioned in Figure 21, 171 (91%) farmers received training on pruning/training of orchard trees as fruit bearing capacity of trees depends on it.Of the surveyed sample, 142 (76%) and 141 (75%) received training on insect and disease control respectively.While 104 (56%) and 80 (43%) farmers got training on nutrient management and sorting and grading. Other trainings mentioned in the table were imparted from 37% to 6% of farmers in the descending order with packing at the upper and credit at the lowest end of the list.

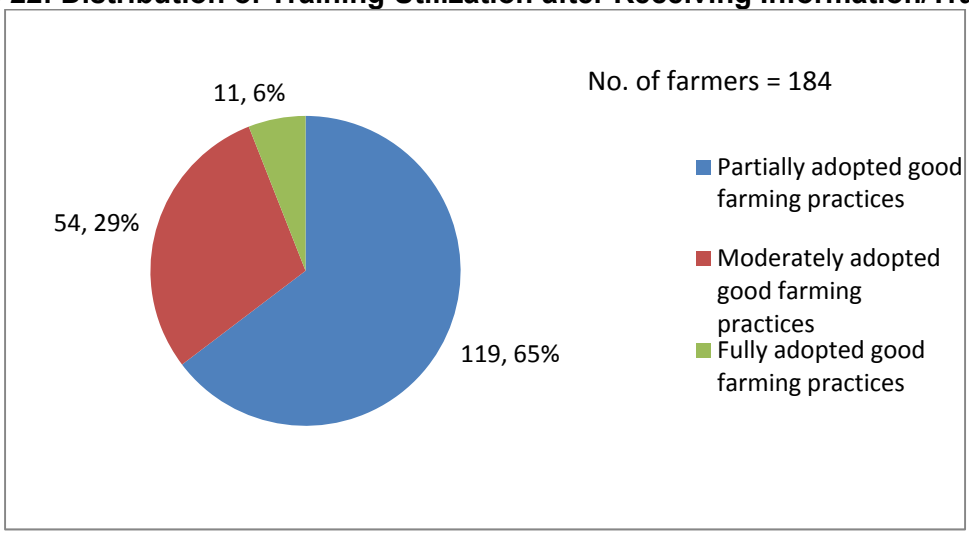
Figure 21: Distribution of Training Received



4.5.2. Scale of Training Utilization

The utilization of training creates an impact and improves productivity. A total of 184 farmers were interviewed for training utilization. Results in Figure 22 show that only 11 (6%) of the farmers fully applied the training. While 119 (65%) and 54 (29%) farmers adopted the practices learned in the training partially and moderately respectively.

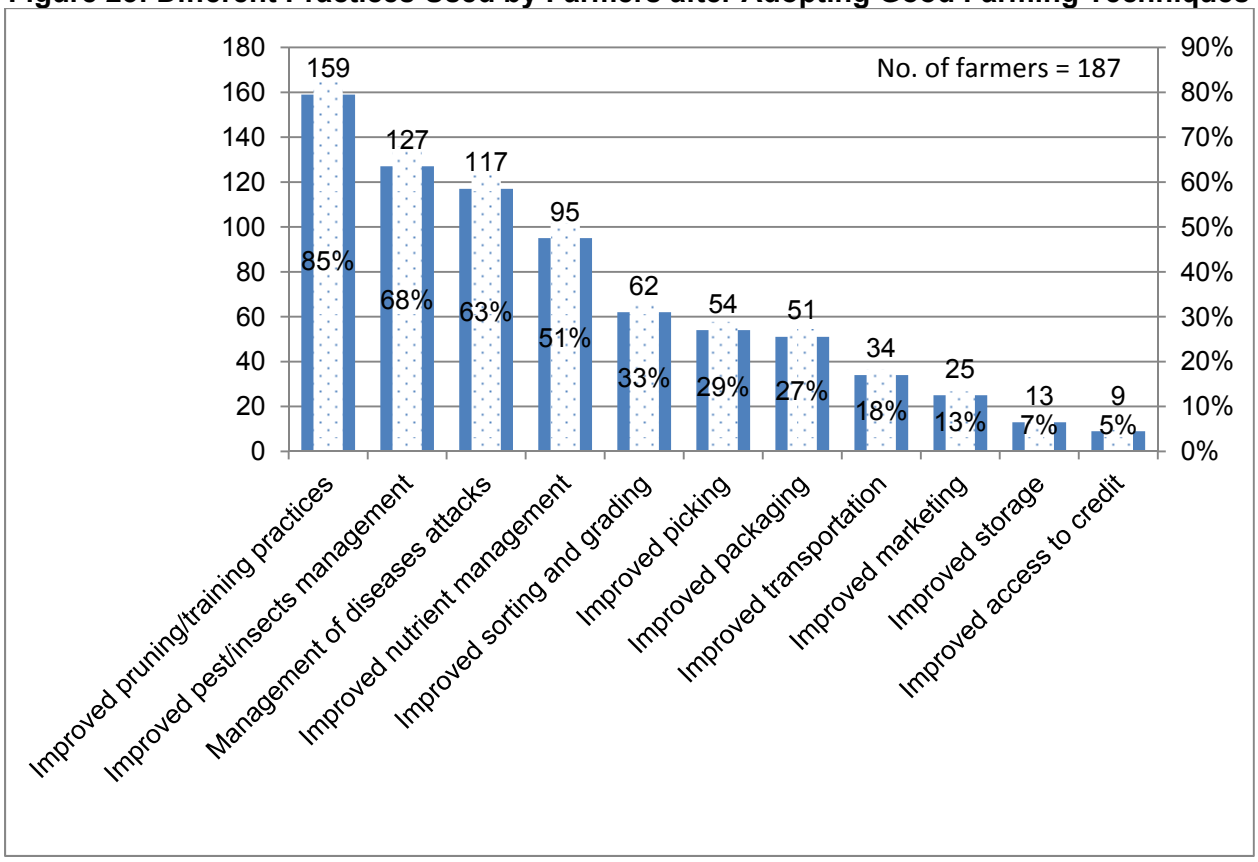
Figure 22: Distribution of Training Utilization after Receiving Information/Trainings



4.5.3. Improved Practices Adopted After Training Received

When asked about the adopted practices from 187 farmers (Figure 23), 159 (85%) reported adopting improved pruning practices. While 127 (68%) and 117 (63%) mentioned insect and disease control respectively. Further down the line 95 (51%) and 62 (33%) replied nutrient management and sorting and grading respectively. Percentage of other adopted practices ranged from 29% to 5% with improved picking at the highest and credit at the lowest end. If these results are compared with the results in Figure 19 on types of trainings received,it becomes clear that order of practices adoption is the same as of trainings received, which speaks of appropriateness of trainings imparted and right selection of trainees. These two criteria are prerequisite for any successful training initiative.

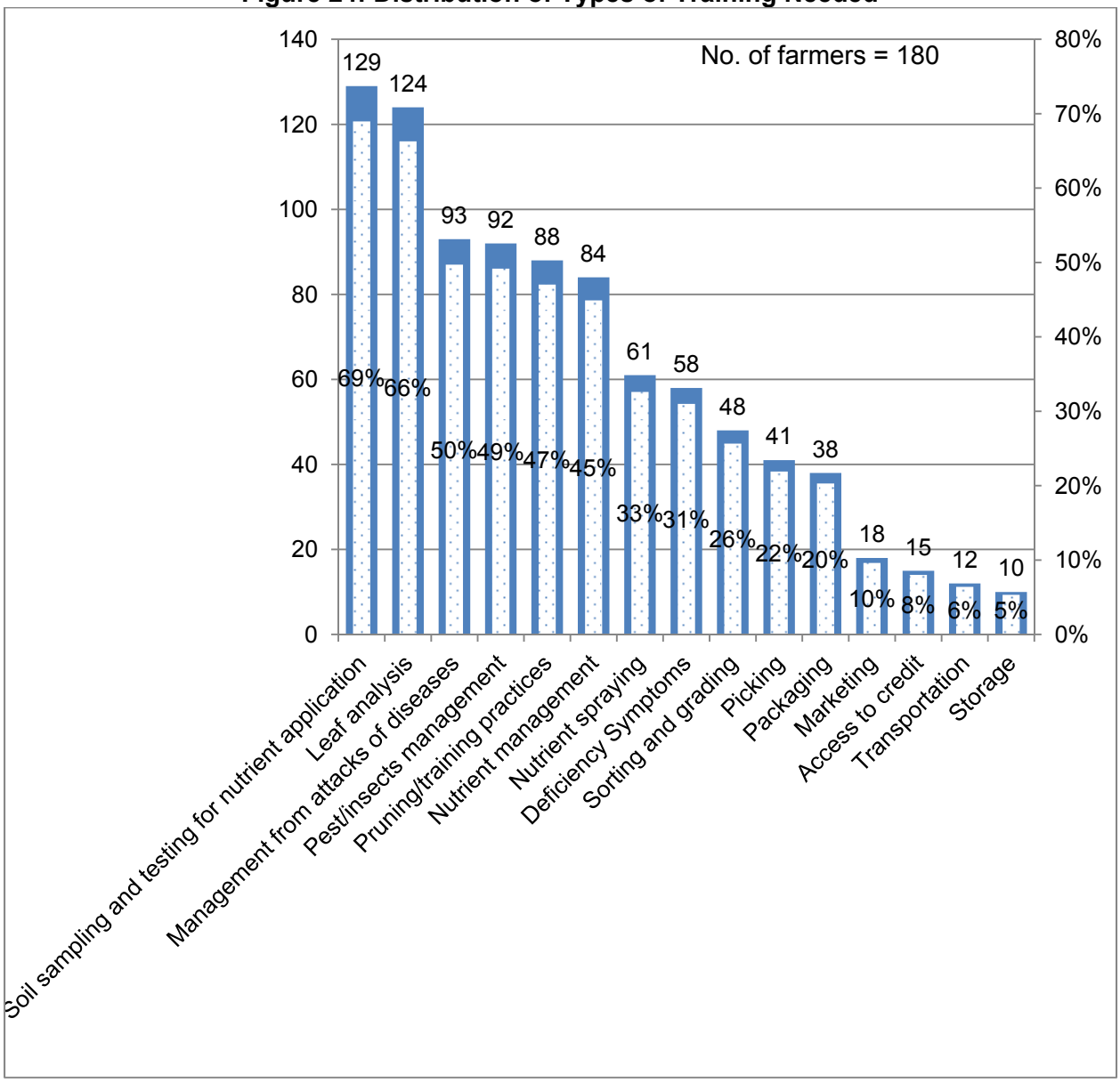
Figure 23: Different Practices Used by Farmers after Adopting Good Farming Techniques



4.5.4. Future Training Needs of Peach Orcharders

During survey when 187 farmers were asked if they need further trainings,180 (96%) replied in positive. About the types of trainings from a list of 15 types are listed in Figure 24 in descending order. From the surveyed sample, 129 (69%) and 124 (66%) farmers mentioned soil sampling and testing and leaf analysis respectively. Diseases and insect control came as answers from 93 (50%) and 92 (49%) farmers respectively. Respective demands for pruning and nutrient management came from 88 (47%) and 84 (45%) respondents. Other types of trainings were demanded from 33%to 5% farmers in descending order with nutrient spraying and storage at the highest and the lowest ends, respectively.

Figure 24: Distribution of Types of Training Needed



5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Potato Survey Conclusions

- The survey was conducted in three tehsils Behrain, Kalam, and Matta in Swat district with 135 potato growers to develop a clear picture of their cultural practices, employment at farms, yield, and income and to take stock of their problems and future requirements.
- Out of total 135 farmers, 127 (94%) mentioned that they were self-cultivators, 7 (5%) were leased farmers and only one worked on *dehkani*.
- Farms divided in three types according to the prevailed management practices: 122 (90%) farmers were self-managers, 11 (8%) tenants, and only 2 (1%)were*dehkani*.
- River and stream irrigation were used by 128 (95%) farmers, spring by 4 (3%) and tube well by 3 (2%).
- Farm distance of within one km from main road was reported by 74 (55%) farmers, 49 (36%) at 1-2 km distance and only 3 (2%) were at more than 4 km.
- Small farmers with 6 acres land were 110 (96%), and 4 (4%) had up to 25 acres (medium farmers).
- Six cultivars – Lady Rozetta, Sterna, Raja, Roco, Diamont, and Desiree –were being sown. In 2011 total area under potato cultivation was 207 acres with a total cost of USD170,388 giving average cost per acre of USD823.
- A comparison of potato production suitability among tehsils shows that Matta is the least suitable of all.
- Total sale value in 2011 was USD298,157 with an average sale value of USD1,653 per acre.Total net income was USD155,819 giving an average of USD1,027 per acre.
- Total number of laborers in potato production in 2011 was 304 in permanent, 3,809 in temporary, and 1,302 in family labors. Permanent labor worked for total 7,900 input days, temporary for 42,336 and family for 14,553. FTE jobs created in 2011 were 32 for permanent, 161 for temporary, and 56 for family laborers, clearly revealing temporary labor demand in the market.
- Farm management is distributed according to the practices prevailed in Swat. Farmers did self-marketingwere 86 (88%) and sub-contractors were 12 (12%) in 2011.
- Main technologies used by potato growers were tractor by 107 (97%) farmers, spraying machine by 55 (50%), and harvesting bin by 22 (20%).
- Apart from self-financing by 70 (64%) farmers, 36 (33%) took loan from family and friends, and 31 (28%).from commission agents/local money lenders.
- Most of the farmers, 50 (81%) out of total 62,wanted credit ranging from USD116 to 2,413.
- Major difficulties faced by potato farmers were unavailability of certified seeds by 103 (76%), attack of diseases by 73 (54%), insect attacks by 54 (40%), lack of proper tools and machinery by 45 (33%), and nutrient deficiencies by 35 (26%).
- Project gave information/training on potato production for 121 (98%) farmers. Farmers who received information from family and relatives were 21 (17%), and 9 (7%) received information/training through TV and radio.
- Majority of farmers received different trainings to help produce higher yields.Of them, 116 (94%) received training on use of high yielding cultivars, 66 (54%) on nutrient management,

66 (54%) on insect control, 55 (44%) on disease control, and 49 (40%) on better irrigation techniques.

- Farmers who adopted fully what they learned in trainings were 67 (68%), followed by those who adopted moderately 9 (9%) and partial adoption by 23 (23%).
- Major farm practices adopted by farmers after getting trainings; 88 (89%) adopted high yielding cultivars, 60 (61%) improved tillage practices, 31 (31%) improved plant nutrition, 26 (26%) selected better land parcels for potato growing.
- Types of trainings wanted by majority of potato growers were; 67 (65%) wanted training on sowing techniques of high yielding cultivars, 61 (59%) on disease control, 46 (45%) on nutrient management, 41 (40%) on appropriate use of tools and machinery, 40 (39%) on insect control, and 34 (33%) on irrigation methods.
- Financial records were kept by 42 (72%) farmers, sales records 41 (71%), and crop production records 34 (58%).
- As farmers wanted to grow new high yielding cultivars,79 (59%) wanted to grow cultivar Roco, 71 (53%) Raja, 29 (21%) Lady Rozetta, 9 (7%) Crozo, and only 3 (2%)DiamontDiamont.
- Reason of priority given by farmers to grow high yielding cultivars were; 127 (94%) gave increased production as a reason, 90 (67%) increased profit, 21 (16%) increased market demand, and 14 (10%) mentioned expertise in production.

5.2. Recommendations to Improve Potato Production in District Swat

After thoroughly analyzing the data the following suggestions can be made to increase potato production and farmers' income:

- Role of farmers' cooperative, agriculture department and related government agencies, and NGOs need to be enhanced as their present contribution is negligible.
- Institutions providing supervised micro credit should be brought in the area.
- Latest market information should be provided to growers.
- Marketing and transport cooperatives should be encouraged.
- In time quality inputs should be ensured in sufficient quantities. Furthermore, seed and fertilizer purchase committees should be established.
- Supply of certified high yielding certified seeds of potato should be ensured.
- Use of farm machinery and efficient farm tools/kits should be encouraged by making them available in the local markets.
- Frequent interactions with farmers to solve their major hindrances are suggested.
- If possible, local seasonal forecasts will help in damage control.
- High need for future trainingsarranged according to growers' priorities. Post training utilization should be supervised and monitored to increase training implementation.
- Trainings for record keeping on cultural practices and crop rotational systems need to be imparted as presently growers lack awareness about these factors contribution in yield formation.

5.3. Peach Survey Conclusions

- The survey was conducted in three tehsils Barikot, Kabal, and Babuzai of district Swat with 188 farmers to develop a holistic picture of peach production covering all aspects.
- Self-cultivatedfarmers in survey area were 159 (85%), followed by 29 (15%) leased gardeners.Farmers who managed their orchards themselveswere 185 (98%)and3 (2%) farms were managed by tenants.Tube well irrigationwas used by 99 (53%) farmers, 88

(47%)farms irrigated through river/stream and only 1 (0.5%) was spring irrigated. Farms' distance of 113 (60%)were situated within 1 to 2 km from the main road, and orchards within less than 1 km were 33 (18%). Only 13 (7%) orchards situated at a distance of more than 4 km.

- Landholdings of small farmers up to 6 acres were 158 (85%), and 26 (14%)were medium farmers with up to 25 acres. Only one farmer wasbiglandholder with more than 25 acres.
- Different cultivars were grown by farmers in 2011; NJC 84 by 107 (58%) farmers, Indian Blood by 74 (40%), Elberta by 51 (28%), Maria Delezia by 45 (24%), Carmon by 39 (21%), Early Green by 34 (18%), and local cultivars like Golden, Hartley, Sohani, and Halian by only 25 (14%).Average tree population per acre varied from 129 to 153 respectively local cultivars to Carmon.
- On the basis of average fruit production per acre from 2010 and 2011, Babuzai and Kabal tehsils are more suitable for peach production.
- Total orchard area used for plantation of peach in 2011 was 770 acres with an average cost of USD1,142 per acre.
- In 2011 total sale value was USD1,610,712 with total net earnings of USD968 per acre.
- Peach gardening is a good labor employer in the area.It employed 155 laborers for 1,070total days per year in permanent labor category. Temporary laborers employed were 8,551 for 11,447days,and family labor was employed were 179 for 834 days in 2011. Total input days of permanent laborers employed were 3,334, temporary laborers 57,729, and family laborers 1,352. In 2011, FTE jobs created for permanent category was 11, temporary 200, and family 5.
- Self-marketing was done by 124(67%) farmers,while 60 (33%) used sub-contractors' services.
- Major technologies used by the growers are tractor by172 (91%), pruning kit by 124 (66%), harvesting bin by 122 (65%), power sprayer by 86 (46%), and harvesting kit by 84 (45%).
- Main difficulties faced by farmers are disease attacks by 140 (74%), insect attacks by 116 (62%), lack of certified plants by 110 (59%), nutrient deficiencies by 101 (54%), post-harvest losses by 64 (34%).
- As self-financed farmers were 132 (70%), 61 (32%) took loans from commission agent or local money lender, 23 (12%) from family and friends, and 3 (2%) from ZTBL.
- Farmers who showed their willingness for credit were 60 (75%) out of total 80, and 32 (53%) farmers wanted amounts of credit ranging from USD116 to 2,878.
- Project gave the information/training to 178 (95%) on production improvement from, 117 (63%) from family and friends, and 59 (32%) from TV and radio.
- Major types of training received by farmers were pruning by 171 (91%), insect attack management by 142 (76%), disease control by 141 (75%),nutrient management by 104 (56%), sorting and grading by 80 (43%), packaging by 70 (37%), and picking by 60 (32%).
- After receiving information and/or training,11 (6%) farmers fully adopted recommended farming practices, 54 (29%) moderately, and partial adoption was by 119 (65%).
- Of the farmers who adopted practices after getting training,159 (85%) improved pruning, 127 (68%) pest management, 117 (63%) disease management, 95 (51%) nutrient management, and 62 (33%) sorting & grading.
- Out of 180 farmers 173 (69%) desired future trainings to improve yields and income.Most of the farmers 129 (69%) wanted training on soil sampling & testing by, leaf analysis by 124 (66%), disease control by 93 (50%), insect control by 92 (49%), improved pruning by 88 (47%), and nutrient management by 84 (45%).Only 5% demanded training on storage.

5.4. Recommendations to ImprovePeach Productionin District Swat

After thoroughly analyzing the data the following suggestions can be made to increase peach production and farmers' income:

- Role of farmers' cooperative, agriculture department and related government agencies, and NGOs need to be enhanced as their present contribution is negligible.
- Institutions providing supervised micro credit should be brought in the area.
- Latest market information should be provided to growers.
- Marketing and transport cooperatives should be encouraged.
- In time quality inputs should be insured in sufficient quantities.
- Supply of certified high yielding transplants of peach should be ensured.
- Use of machinery and efficient orchary tools/kits should be encouraged by making them available in the local markets.
- Frequent interactions with farmers to resolve their major hindrances are suggested.
- If possible local seasonal forecasts will help in damage control.
- High need for future trainingsarranged according to growers' priorities. Post training utilization should be supervised and monitored to increase training implementation.
- Farmers should be trained in the areas of pruning, standardized plant to plant spacing, leaf analysis, and nutrient spraying.

6. APPENDICES

Appendix 1: Scope of Work and Deliverables

Scope of Work (SOW) and Deliverables Schedule

Below is the SOW for the RFP. For this RFP, the term "Subcontractor' means the successful offerer who is awarded the subcontract as a result of this RFP.

Program Overview

The objective of the USAID Firms Project (the 'Project') is to improve government service delivery and develop dynamic, internationally competitive firms to accelerate sales, investment, and job growth to undercut the basis of extremism. The Project aims to work in at-risk districts such as Swat. Swat is known for its fruits (apples, peaches, plums, apricots, and persimmons) and vegetables (onions, potatoes, tomatoes, turnips, peas, cabbage, etc.). Currently, 44 percent of the Swat district economy is based on horticulture, which indirectly supports other sectors such as tourism and other agro-based industries.
The peach and potatoes sectors create employment opportunities for a large number of people. Despite this, a significant amount of produce is wasted due to pre- and post-harvest losses. Additionally, the growth of these sectors is limited due to a lack of access to inputs supplies, market information, market linkages, and credit facilities as well as an untrained work force, poor management practices, inability to meet product standards (quality, consistency, hygiene, etc.), and non-availability of pulping units to utilize B, C, and D grade fruit for pulp processing and value additions. Increasing the economic value of these sectors begins with minimizing losses during pre- and post-harvest, increasing yields, and diversifying end market opportunities for producers. The Project has devised peach and potato sector development projects to improve production and increase sales revenue for the identified horticulture value chains in vulnerable areas of Pakistan and by doing so, is supporting the rehabilitation and recapitalization of conflict and flood-affected small and medium enterprises (SMEs).

Scope of Work

The Project intends to work with approximately 800 peach growers who will be organized in roughly 20 clusters of approximately 40 farmers per cluster and 533 potato growers who will be organized in roughly 13 clusters of approximately 41 farmers per cluster. Project interventions will be provided at the cluster level.
The purpose of this activity is to establish a baseline of the peach and potato growers with reference to farm management and marketing practices with a specific focus on access to credit services and facilities, technical advice and training facilities, inputs supplies, market information, and market linkages. The findings of this survey will help the project develop appropriate response strategies for better production and sales revenue for project beneficiaries. The collected data that would serve as a basis of comparison with end line data as well as helping the project team in project design and implementation of interventions. The specific objectives of the survey are:

a. Assessment of farms management practices for peach and potato growers;
b. Map the different varieties of peach and potato being cultivated by farmers and assess the production and yield for each variety;
c. Assess the extent to which peach and potato growers have access to input supplies;
d. Assess the extent to which peach and potato growers have access to credit services/facilities;
e. Conduct training needs assessments of the peach and potato growers; and
f. Assess the market information and market linkages of the peach and potato growers.

The Subcontractor will conduct a baseline survey including detailed sampling procedure and plan for data analysis, data collection instruments, time frame and work plan. The survey protocols will ensure that the data collected will be unbiased and comparable with future end line surveys. The survey team will perform the following specific tasks:

a. Develop/Finalize the survey protocols including detailed sampling procedure, data collection instruments, time frame, work plan and detailed analysis plan.
    i. Develop/finalize a set of individually administered surveys targeting relevant groups of interests as defined by the study design and sampling plans in close collaboration with the Project's M&E and technical assistance team;

   ii. Collaborate with the Project's M&E and technical assistance team to design survey methodology and quantitative survey assessment instruments for the collection of information related to this survey;
   iii. Seek approval from the Project's M&E Advisor on survey design, methodology, time frame, and any instruments to be used during the survey.
b. Collect GPS coordinates for each village visited.
c. Where possible and required, coordinate with relevant local government officials, community elders and other relevant notables for the smooth implementation of the survey.
d. As per the Project's guidelines, design and facilitate a workshop (or series of workshops) to train enumerators, supervisors and other members of survey team to carry out data collection associated task with the base line in targeted groups;
e. Directly supervise the enumerators, field supervisors, field editors and other members of the field teams
f. Conduct pilot testing of data collection instruments and, where necessary, work with the Project's M&E and technical assistance team to make the minor modification of the survey instruments based on results of pilot testing, if required;
g. Conduct mock survey as part of the training of survey team.
h. Supervise implementation of the end line survey in target areas in accordance with approved sampling plan;
i. As part of the supervision process, conduct spot quality-assurance checks to ensure adequate performance of enumerator involved in data collection as per the guidelines/checklist provided by the Project ;
j. Develop an analysis plan and seek Project's approval.
k. Develop appropriate entry program in MS Access and any other relevant software (NOT EXCEL) for data entry and perform random checks to ensure the quality of the entered data.
l. Before the data analysis, perform data cleaning on the entered data to ensure that data is clean of any entry errors and reflects the data gathered through questionnaires.
m. Undertake a detailed analysis the data collected in SPSS or other relevant software (NOT EXCEL) and provide descriptive statistics for all variables and inferential statistics for planned comparisons included in the data analysis plan;
n. Produce a statistical report of the above (with sufficient narrative content to facilitate understanding and utilization by those with limited statistical background) and provide draft to the Project for review and comment;
o. Conduct any supplemental analysis based on feedback from the Project include results in final Report;
p. Work closely with USAID Firms Project focal point and M&E team in Lahore throughout the contract Period;
q. Adhere to all relevant policies and procedures of the USAID Firms Project; and
r. Adhere to the ethical guidelines as outlined in Annex A to this document.

Survey Methodology1:
Baseline Survey of Peach Growers:
Sample size

The baseline survey will only target those growers who agreed to participate in the peach sector initiative. The following formula is used to calculate the sample size. This formula is appropriate for baseline measurements of multi-variable surveys. It establishes variation and expected proportions of key variables which subsequent surveys can use to base sample sizes required for estimating differences in means or proportions. This formula also takes into account the magnitude of change that can be detected with 95 percent confidence given the expected standard deviations for the indicators of interest.

The targets of the peach programs have been scaled down. Now the program intends to work with approximately 440 peach farmers (organized in 11 clusters of approximately 40 farmers each). The sample target is also revised to this effect. Following is the revised sampling methodology:

[1]Survey methodology is described to provide a fair idea of the scale and nature of work required. Bidding parties are open to propose alternative methodology which will be judged on its technical quality in an objective manner.

The baseline survey will only target those growers who agreed to participate in the peach sector initiative. Following formula is used to calculate the sample size for the study:

Sample Size (n) = Deff [(Zα + Zβ)2 * {Pb (1 - Pb) + Pe (1 - Pe)}] /(Pe -Pb)2

Where,

Design effect (Deff) is set to 1.2
Zα (significance) and the Zβ (power) is set to 0.95
Proportion at endline is set to 0.65

The equations above include "deff' for the design effect. This provides a correction for the loss of sampling efficiency resulting from the use of cluster sampling instead of simple random sampling, and the gain of sampling efficiency resulting from stratification. It is the factor by which the sample size must be multiplied by in order to produce survey estimates with the same precision as a simple random sample. It was assumed a priori that inter-household variation is small compared to that of population-based surveys that are based on severity classes" Thus, a design effect (deff) of 1.2 was used"
By applying this formula the total required sample comes to 299. After calculating the finite population correction (based on total 440 farmers) and factoring-in the 5% for non-response and 5% for incomplete or discarded questionnaire, the sample target comes to 188. Following is the finite population correction

$N = n_o / [1+\{(n_o -1)/N\}]$

Where,

n = sample size
N = Population size (i.e. total number of participating peach growers)
n_o = sample size to be adjusted

The total sample required is this 188.

Selection of Farmers:

To reach the sample target of 188 farmers; seven (out of eleven) cluster will randomly selected and twenty seven farmer from each cluster will be randomly selected for the interview (7 cluster * 27 farmers each = 189 farmers)

Survey Instrument:

A closed ended questionnaire will be administered for the survey. This USAID Firms Project team will develop and pre-test the questionnaire before the start of formal survey.

Baseline Survey of Potato Growers:

Sampling methodology for the potato sector baseline is similar to that of peach sector survey as described above. The baseline survey will only target those growers who agreed to participate in the potato sector development initiative.

Sample Size:

The baseline survey will only target those growers who agreed to participate in the potato sector initiative. The following formula is used to calculate the sample size. This formula is appropriate for baseline measurements of multi-variable surveys. It establishes variation and expected proportions of key variables which subsequent surveys can use to base sample sizes required for estimating differences in means or proportions. This formula also takes into account the magnitude of change that can be detected with 95 percent confidence given the expected standard deviations for the indicators of interest.

The targets of the potato programs have been scaled down. Now the program intends to work with approximately 280 potato farmers (organized in 7 clusters of approximately 40 farmers each). The sample target is also revised to this effect. Following is the revised sampling methodology:

The baseline survey will only target those growers who agreed to participate in the potato sector initiative. Following formula is used to calculate the sample size for the study:

Sample Size (n) = Deff [(Zα + Zβ)2 * {Pb (1 - Pb) + Pe (1 - Pe)}] /(Pe -Pb)2

Where,

Design effect (Deff) is set to 1.2

Zα (significance) and the Zβ (power) is set to 0.95
Proportion at endline is set to 0.65

The equations above include "deff' for the design effect. This provides a correction for the loss of sampling efficiency resulting from the use of cluster sampling instead of simple random sampling, and the gain of sampling efficiency resulting from stratification. It is the factor by which the sample size must be multiplied by in order to produce survey estimates with the same precision as a simple random sample. It was assumed a priori that inter-household variation is small compared to that of population-based surveys that are based on severity classes" Thus, a design effect (deff) of 1.2 was used"
By applying this formula the total required sample comes to 299. After calculating the finite population correction (based on total 440 farmers) and factoring-in the 5% for non-response and 5% for incomplete or discarded questionnaire, the sample target comes to 154. Following is the finite population correction

$N = n_o / [1+\{(n_o -1)/N\}]$
Where,
n = sample size
N = Population size (i.e. total number of participating peach growers)
n_o = sample size to be adjusted
The total sample required is this 154.

Selection of Farmers:

To reach the sample target of 154 farmers; six (out of seven) cluster will randomly selected and twenty six farmer from each cluster will be randomly selected for the interview (6 cluster * 26 farmers each = 156 farmers)

Survey Instrument:

A closed ended questionnaire will be administered for the survey. This USAID Firms Project team will develop and pre-test the questionnaire before the start of formal survey.

Deliverables

The Subcontractor shall deliver to Chemonics the following deliverables, in accordance with the schedule set forth, below.

a. Submit base line survey protocols to the Project for approval.
b. Submit a brief report (maximum four pages) of the enumerators/supervisors training/s.
c. Submit a detailed analysis plan to the Project for approval.
d. Submit soft copy of the data entry program to the Project for approval.
e. Regularly provide brief written updates on the survey process[2].
f. Present the preliminary findings in English to the Project management and relevant staff.
g. Submit the draft report in English language as per the format provided by the Project. The report could be a combined report with different sections for the peaches and potatoes sectors.
h. Submit final Survey Report in English language after receiving the feedback from the Project on the draft report.
i. Submit data set on SPSS or any analysis software used including programmed, syntaxes, final copy of the entry program and soft copies of the information collected from the field (e.g. photo) used for data analysis.
j. Submit properly filed/archived hard copies of filled-in questionnaires and any other instrument/data collection tool used during the survey.

Deliverables Schedule

The Subcontractor shall submit the deliverables described above in accordance with the following Deliverables Schedule:

Deliverable #	Due Date
Deliverable a	Before the start of the survey
Deliverable b	Within three calendar days after finishing the training
Deliverable c	Within five calendar of start of field work
Deliverable d	Within five calendar of start of field work

[2] These may be short electronic updates. Format and frequency will be negotiated later with the successful contractor.

Deliverable e	TBD
Deliverable f	Within ten calendar days of completion of field work
Deliverable g	Within fifteen calendar days of completion of field work
Deliverable h	Within seven calendar days of receiving feedback on draft report
Deliverable i	TBD
Deliverable j	TBD

Period of Performance
The period of performance will be between March, 2012 and May, 2012.

Location of Performance
The construction will take place at Swat.

Supervision and Reporting
The Subcontractor will report to the Project's Monitoring & Evaluation Advisor, Shahzad Tahir.

Key Personnel
List of persons, provided by the subcontractor, for the positions listed below are considered Key Personnel for this subcontract and are considered to be essential to the work being performed hereunder. Prior to replacing key personnel, the Subcontractor shall immediately notify Chemonics reasonably in advance and shall submit written justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the work to be performed.
No replacement of key personnel shall be made by the Subcontractor without the written consent of Chemonics.

a. Survey Manager/Team Leader
b. Supervisor
c. Enumerator
d. Data Entry Operator
e. Data Analyst
f. Agriculture/Horticulture Specialist

Qualification of Key Personnel
Survey Manager/Team Leader: S/he will be responsible for overseeing the entire data collection and analysis. The team leader will be the point of contact for obtaining feedback on the progress of the survey. It is the duty of the team leader to ensure that the timelines are followed and any challenges are reported. S/he will also present the preliminary and final survey findings. The person must meet the following qualification and experience requirements.

a. Minimum Education: Master's in Social Science.
b. Minimum Experience: At least five years of experience in research and survey methods.
c. Excellent understanding of the survey research.
d. Must possess good communication and interpersonal skill.
e. Available to verify data at any time needed, including morning, afternoon and evening.
f. Willing to be deployed in all districts of Swat and Malakand region.
g. Must be able to speak Pashto, Urdu, and an excellent command over written and spoken English.

Supervisor: S/he will be responsible for overseeing the collection and verification of data. The supervisor will perform spot checks on random days and times during the six days of data collection phase. The person must meet the following qualification and experience requirements.

a. Minimum Education: Bachelor in Social Science.
b. Minimum Experience: At least two years of experience in overseeing surveys.
c. Experience of implementing survey plan.
d. Good understanding of the survey research.
e. Must possess good communication and interpersonal skill.
f. Available to verify data at any time needed, including morning, afternoon and evening.
g. Willing to be deployed in all districts of Swat and Malakand region.
h. Must be able to speak Pashto, Urdu, and understand English.

Enumerators: Each enumerator should preferably be from Swat/Malakand or KPK, if local people are not available. S/he will be responsible for accurate data collection, photography and supporting documents. The person must meet the following qualification and experience requirements.

a. Minimum Education: Bachelor in Social Science (Sociology, Anthropology, Rural Development or other relevant discipline).

b. Minimum Experience: At least two years of data collection experience in research techniques such as questionnaire administration and conducting focus groups discussions (FGDs) with farmers, community elders, market vendors and government officials.
c. Good understanding of the survey research.
d. Must possess good communication and interpersonal skill
e. Available to collect data at any time needed, including morning, afternoon and evening. (Especially to enumerators with responsibility to house visiting).
f. Willing to be deployed in all districts of Swat and Malakand region.
g. Must be able to speak Pashto, Urdu, and understand English.

Data Entry Operators: Each data entry operator will be responsible for entering accurate data into the database provided. The four data entry personnel would be divided as follows: two, people for four days each for potatoes; and two people for four days each for peaches. The person must meet the following qualification and experience requirements.

a. Minimum Education: College graduation.
b. Minimum Experience: At least one year of data entry experience in any database.
c. Good understanding of the survey research.
d. Must possess good communication and interpersonal skill.
e. Must be able to understand English.

Data Analyst: The data analyst will be responsible for accurate data analysis. The person must meet the following qualification and experience requirements.

a. Minimum Education: Master's in Statistics
b. Minimum Experience: At least four years of data analysis experience in analyzing and interpreting data.
c. Excellent understanding of the survey research.
d. The personnel should follow a methodical and logical approach in order to examine the findings of the data collection exercise.
e. Expert Professional level skills in database such as SPSS or other relevant data analysis applications.

Agriculture/Horticulture Specialist (for technical support and report writing): S/he will be responsible for providing technical knowledge and writing the draft for survey findings. The person must meet the following qualification and experience requirements.

a. Minimum Education: Masters/PHD in Agronomy, Agricultural Economics or related subjects.
b. Minimum Experience: At least 10 years of experience in carrying out benchmarking exercises, preferably for agricultural research in potatoes and peaches"
c. Good understanding of the survey research.
d. Must be willing to work in partnership with the survey manager/team lead and the data analyst to ensure sound technical direction for the survey results
e. Proven recent experience with managing horticulture developments in post-conflict contexts
f. Fluency in English language
g. Proven communications and reporting skills

Appendix 2: Potato Questionnaire

Malakand Chips Stock Potato Sector Development Program–Baseline Survey: **Potato Farmer Questionnaire**

بیس لائن سروے - مالا کنڈ چپس سٹاک پوٹیٹو سیکٹر ڈیولپمنٹ پروگرام

سوالنامہ برائے استفادہ کنندگان

Questionnaire Number (For official use only) سوالنامہ نمبر (صرف دفتری استعمال کیلئے)					

USAID Firms Project–Malakand Chips Stock Potato Sector Development Program

Farmers Baseline Survey Questionnaire

یو ایس ایڈ فرمزپراجیکٹ – مالاکنڈ چپس سٹاک پوٹیٹو سیکٹر ڈویلپمنٹ پروگرام

کسانوں کے بنیادی سروے سے متعلق سوالنامہ

Introduction:

Good Day/Morning/Afternoon! My name is _____. I/We come on behalf of the USAID Firms Project. We are carrying out a base line survey of the partner potato farmers in Swat district with the objective to assess their production, farm management and marketing practices. The emphasisof this survey is to assess farmers' access to inputs, tools and machinery, technical advice and training facilities, market information/linkages and access to credit facilities. The findings of this survey will help Firms to develop appropriate response strategies for better production and sales revenue.

تعارف:

السلام علیکم! میرا نام _____ ہے۔ میں/ہم یوایس ایڈ فرمز پراجیکٹ کی طرف سے یہاں حاضر ہوئے ہیں۔ ہم ضلع سوات کے کسانوں سے بنیادی سروے کر دہے ہیں، جس کا مقصد ہے کہ ان کی پیداوار، کھیت کے انتظام اور مارکیٹنگ کے طریقوں کا تَعیُن کیا جا سکے ۔ اس سروے کی توجہ ہے کہ کسانوں کی ان پٹ تک رسائی، آلات اور مشینری تک رسائی، تکنیکی مشورہ اور تربیت کی سہولیات، مارکیٹ کی معلومات / رابطوں اور کریڈٹ کی سہولیات تک رسائی کا اندازہ لگانا ہے۔ اس سروے کے نتائج کسانوں کو بہتر پیداوار اور فروخت کی آمدنی کے لئے مناسب حکمت عملی تیار کرنے کے لئے مدد کرے گا۔

You, being a potato grower, were chosen for this interview based on your participation in the program through the respective potato cluster. You may choose not to answer the question that was put forward or stop the interview at any time you like.

آپ کیونکہ آلو اگانے یا لگانے کی صلاحیت رکھتے ہیں، اورآپ نے اس پروگرام میں شمولیت کی درخواست کی ہے اس لیے آ پ کو اس انٹرویو کے لیے منتخب کیا گیا ہے۔ پھر بھی آپ جب چاہیں اس انٹرویو کو ختم کر سکتے ہیں یا جو آپ سے سوال پوچھا گیا ہے اس کا جواب نہ دینا چاہیں۔

All the answers are confidential. Your participation and the information you share with us won't affect your relationship with your community or Firms Project because whatever you are saying as a person won't be shared with others. Your name will not be quoted in the report. Your answers will not be judged either right or wrong.

آپ کے تمام جوابات صیغہ راز میں رکھے جائیں گے۔ آپ جو معلومات بھی فراہم کریں گے اس سے آپ کے کمیونٹی (متعلقین) یا فرمز پراجیکٹ کے ارباب اختیار کے ساتھ تعلقات پر اثر نہیں ہوگا۔ کیونکہ آپ کے ذاتی خیالات دوسروں تک نہیں پہنچ پائیں گے۔ آپ کا نام رپورٹ میں نہیں آئے گا۔ آپ کے جوابات غلط یا صحیح کے پیمانے پر نہیں پرکھے جائیں گے۔

This interview will take about twenty five minutes. At this time, do you want to ask me anything about the survey?

اس انٹرویو پر تقریبا پچیس منٹ صرف ہونگے۔ اس مرحلے پر، آپ سروے سے متعلق کچھ پوچھنا چاہیں گے؟

We are very grateful for your sincere answers. ہم آپ کے جوابات کے لیے بہت بہت شکریہ کہتے ہیں!

Would you like to participate in this survey? کیا آپ سروے میں شامل ہونا چاہتے ہیں؟

Respondent Agrees To Be Interviewed(سوال کنندہ جواب دینے پر رضامند ہے)----------**01**

Respondent Does Not Agree To Be Interviewed---------- (سوال کنندہ دینے پر رضامند نہیں ہے)**02**

Start the Interview(انٹرویوشروع کیجیے**)**

(See your watch and enter)(گھڑی دیکھ کر وقت نوٹ کیجیے!) _____

*If permission is given, begin the interview. If the respondent does not agree to continue, thank him/her and go to the next interview. Discuss this result with your supervisor for a future revisit***.**

نوٹ : اگر اجازت ملے، تو انٹرویو شروع کیجئے۔ اگر مدعا علیہ جاری رکھنے کے لئے رضامند نہ ہو، تو اسکا شکریہ ادا کیجیے اور اگلے کسان کی طرف جائیے۔ ان جوابات کو اپنے سپروائزر کے ساتھ ڈسکس کیجیے تاکہ آئندہ (دوبارہ ملاقات) کا فیصلہ کیا جا سکے۔

Result of Interview: ویو کا نتیجہ *(to be completed at end)* (انٹرویو کےآخر میں مکمل کیا جائے گا)	Completed(مکمل)----------1 Refused to answer(جواب دینے سے انکار کر دیا) ----------2 Partly completed(جزوی طور پر مکمل) ----------3 Other (specify)_____ دیگر (وضاحت)

	Questionnaire ID (شناخت جواب دہندہ)	Response (جواب)	SKIP
ID1	Province Name: صوبےکا نام		
ID2	District Name: ضلع کا نام		
ID3	Village Name: گاوں کا نام		
ID4	Farmer's Cluster Name/#: کسان کے گروپ کانام/ نمبر		
ID5	Interview date: (DD/MM/YYYY) انٹرویو کی تاریخ		

ID6	**Interviewed by:** Name of Enumerator : شمار کنندہ کا نام (APEX Consulting) Date (DD/MM/YY)	_____ _____	
ID7	**Checked by:** تصدیق کنندہ Name of Supervisor نام سپروائزر (APEX Consulting) Date (DD/MM/YY)	_____ _____	

ID8	**Entered by:** ا ندراج کنند ہ Name of the Data Entry Operator نام ڈ یٹا انٹری آپریٹر (APEX Consulting)	_____	
ID9	**Checked by:** تصدیق کنندہ Name of the Data Entry Manager نام ڈیٹا انٹری منیجر (APEX Consulting): *(check questionnaire for completeness and assign sequential ID on top of this page data entry)* (تسلی کر لیں کہ فارم مکمل ہو گیا ہے۔ اور فارم کے اوپری حصہ پر ترتیب وار شناختی نمبر کا اندراج کریں)	_____	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses.....(جوابات/ردِعمل)	Skip
A - Personal Information (ذاتی معلومات)			
A1	Respondent's Name: جواب دہندہ کا نام		
A2	Respondent's Father's Name: جواب دہندہ کی ولدیت		
A3	Respondent's CNIC #: جواب دہندہ کا کمپیوٹرائزڈ شناختی کارڈ نمبر		
A4	Sex of the Respondent: جواب دہندہ کی جنس	Male(مرد) ..... 1 Female(عورت) 2	
A5	Respondent's Age : (in completed years) جواب دہندہ کی عمر(سالوں میں)		
A6	Respondent's Education Level: (in completed years) جواب دہندہ کا تعلیمی معیار(سالوں میں)		
A7	Respondent's Phone / Cell Number: جواب دہندہ کا فون/ موبائل نمبر		
A8	Respondent's Email (if any) جواب دہندہ کا ای-میل ایڈریس (اگر ہو تو)		
A9	Complete Address of the Respondent: جواب دہندہ کا مکمل پتہ	Village(گاؤں) ..... UC(یونین کونسل)..... Tehsil (تحصیل) ..... District (ضلع)	
A10	Complete address of the Respondent's Peach Orchard: جواب دہندہ کے آلو فارم کا مکمل پتہ	Village(گاؤں) ..... UC(یونین کونسل)..... Tehsil (تحصیل) ..... District (ضلع)	**SKIP if same as A9**
A11	Name of Alternate Contact person: نام برائے مُتبادل رابطہ (Write name of Peach orchard owner in case of Leased in as per B-1 below) (اگر زمین1- B کے طور پر پٹے پر لی گئی ہےتو آلو فارم کے مالک کا نام لکھیں)		
A12	Contact/Phone # of alternate Contact person: فون نمبر برائے مُتبادل رابطہ		

Q#	Questions & Instruction (سوالات و ہدایات)	Responses .....(جوابات/ردِعمل)	Skip
	B - Potato Farm Information معلومات بابت آلو فارم		
B1	Status of farm ownership فارم کی حیثیت ملکیت	Self-Cultivated خود کاشت کرتے ہیں.....1 Leased In پٹا/جارہ پر لیا ہے.....2 Other (Specify) اس کے علاوہ..... ( )	
B2	How do you manage your potato farm? اپنےآلو کے فارم کا انتظام کس طرح کرتے ہیں؟	Self-managed خود انتظام کرتے ہیں.....1 Tenants کرائے پر .....2 Other (Specify) اس کے علاوہ..... ( )	
B3	What is your source of irrigation water?	Tube well ٹیوب ویل.....1	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)		Skip
	آپ کے آبپاشی کےزرائع کیا ہیں؟	River/Stream دریا / ندی وغیرہ .....2 Spring بارانی .....3 Other (Specify) اس کے علاوہ ..... ( )		
B4	What is the distance of your farm to the main (metal) road? مین روڈ سے فارم کا فاصلہ اور وقت کتنا لگتا ہے؟	_____KM کلومیٹر _____Hrs گھنٹے		
B5	Please provide a break-up of various categories of potato in Kgs you produced and its cultivation area in the past two years. 2010اور 2011میں کاشت شدہ آلو کی اقسام اور پیدا وار بتائیں؟	**2010**	**2011**	
	a. Chips stock variety (Lady Rozetta) چپس سٹاک قسم (لیڈی روزیٹا)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	b. Chips stock variety (Hermus) چپس سٹاک قسم (ہرمس)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	c. Chips stock variety (Crozo) چپس سٹاک قسم (کروزو)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	d. Chips stock variety (Sterna) چپس سٹاک قسم (اسٹرن/سٹرنہ)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	e. Table potato variety (Raja) ٹیبل پوٹیٹو قسم (راجہ)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	f. Table potato variety (Roco) ٹیبل پوٹیٹو قسم (ریکو)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	g. Table potato variety (DiamontDiamont) ٹیبل پوٹیٹو قسم (ڈائمنڈ)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
	h. Other (Specify) _____ دیگر (واضح کیجئے)	_____ Kg _____ Jareeb کلوگرام جریب	_____ Kg _____ Jareeb کلوگرام جریب	
B6	How much area (in Jareeb) have you cultivated under potato in past two years? آپ نے پچھلے دو سالوں میں کتنے رقبے(جریب) پر آلو کاشت کیا ؟ Note: 1 Jareeb is equal to 4 Kanals نو ٹ ۔ ایک جریب چار کنال کے برابر ہوتا ہے۔	_____Jareeb(جریب)	_____Jareeb(جریب)	
B7	How did you sell/market your potato produce in 2011? 2011میں آپ نے آلو کی پیداوار کو کس طرح فروخت کیا یا بازار میں لے کر گئے ؟ -	Self (خود فروخت کیا) .....1 Sub-contractor (بیوپاری کے ذریعے فروخت کی) .....2 Other (Specify) اس کے علاوہ.....( )		**2⇨skip B8b**
B8	What was the total production cost of potato cultivation (Provide break-Up)? کل پیداواری لاگت بتائیں؟			

2010

Activity سرگرمی	Permanent labour مُستقل لیبر			Temporary labour عارضی لیبر			Family Labour خاندان لیبر		
	Qty تعداد	Day دن	Cost خرچہ	Qty تعداد	Day دن	Cost خرچہ	Qty تعداد	Day دن	Cost خرچہ

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)									Skip
	a) Input Costs ان پٹ کی لاگت										
	i. Purchase of seeds بیج کی لاگت	-	-		-	-	-	-	-	-	
	ii. Purchase of fertilizers کھاد کی لاگت	-	-		-	-	-	-	-	-	
	iii. Purchase of pesticides ادویات کی لاگت	-	-		-	-	-	-	-	-	
	iv. Purchase of white wash چونے کی لاگت	-	-		-	-	-	-	-	-	
	v. Preparation of land زمین کی تیاری کی لاگت										
	vi. Planting/sowing بوائی کی لاگت										
	vii. Hoeing گوڈی کی لاگت										
	viii. Irrigation آبپاشی پر لاگت										
	ix. Fertilizer کھاد ڈلوانےکی لاگت										
	x. Spray سپرے کرنےکی لاگت										
	xi. White washing چونا لگوانے کی لاگت										
	xii. Others اس کے علاوہ										
	b) Harvesting and Post Harvesting Costs آلونکلوانے اور اُس کے بعد کی لاگت										
	i. Purchase of Packaging material پیکجنگ مواد کی لاگت	-	-	-		-	-	-	-	-	
	ii. Purchase of Packing material پیکنگ مواد کی لاگت	-	-	-		-	-	-	-	-	
	iii. Harvesting نکلوانے کی لاگت										
	iv. Sorting and grading چھانٹ اور گریڈ										
	v. Packaging پیکجنگ کی لاگت										
	vi. Loading on vehicle لوڈنگ کی لاگت										
	vii. Transportation نقل و حمل لاگت										
	viii. Unloading from vehicle گاڑی سے اُتارنے کی لاگت										
	ix. Munshiana مُنشیانا										
	x. Market Fees مارکیٹ فیس										
	xi. Commission کمیشن										

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)									Skip
	xii. Others اس کے علاوہ										

2011

Activity سرگرمی	Permanent labour مُستقل لیبر			Temporary labour عارضی لیبر			Family Labour خاندان لیبر		
	Qty تعداد	Day دن	Cost خرچہ	Qty تعداد	Day دن	Cost خرچہ	Qty تعداد	Day دن	Cost خرچہ
c) Input Costs ان پٹ کی لاگت									
xiii. Purchase of seeds بیج کی لاگت	-	-		-	-	-	-	-	-
xiv. Purchase of fertilizers کھاد کی لاگت	-	-		-	-	-	-	-	-
xv. Purchase of pesticides ادویات کی لاگت	-	-		-	-	-	-	-	-
xvi. Purchase of white wash چونے کی لاگت	-	-		-	-	-	-	-	-
xvii. Preparation of land زمین کی تیاری کی لاگت									
xviii. Planting/sowing بوائی کی لاگت									
xix. Hoeing گوڈی کی لاگت									
xx. Irrigation آبپاشی پر لاگت									
xxi. Fertilizer کھاد ڈلوانےکی لاگت									
xxii. Spray سپرے کرنےکی لاگت									
xxiii. White washing چونا لگوانے کی لاگت									
xxiv. Others اس کے علاوہ									
d) Harvesting and Post Harvesting Costs آلونکلوانے اور اُس کے بعد کی لاگت									
xiii. Purchase of Packaging material پیکجنگ مواد کی لاگت	-	-	-		-	-	-	-	-
xiv. Purchase of Packing material پیکنگ مواد کی لاگت	-	-	-		-	-	-	-	-
xv. Harvesting نکلوانے کی لاگت									
xvi. Sorting and grading چھانٹ اور گریڈ									
xvii. Packaging پیکجنگ کی لاگت									
xviii. Loading on vehicle لوڈنگ کی لاگت									
xix. Transportation									

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)	Skip
	نقل و حمل لاگت		
	xx. Unloading from vehicle گاڑی سے اُتارنے کی لاگت		
	xxi. Munshiana مُنشیانا		
	xxii. Market Fees مارکیٹ فیس		
	xxiii. Commission کمیشن		
	xxiv. Others اس کے علاوہ		
	e) How many females were working on this farm in 2011? اس فارم پر خواتین کی تعداد2011 میں کتنی تھی؟ Permanent (مُستقل)_____ Temporary(عارضی)_____ Family(خاندان)_____. f) How many males were working on this farm in 2011? اس فارم پرمرد کی تعداد2011 میں کتنی تھی Permanent (مُستقل) _____ Temporary (عارضی)_____ Family(خاندان)_____. g) How many average hours worked in one day? ایک دن میں اوسط کتنے گھنٹے کام کیا؟ Males (مرد)_____ Females(خواتین)_____.		
B9	What was the total income from the sale of potato? آلو کی فروخت سے حاصل شدہ کُل آمدن	**2010**: _____PKR(روپے) **2011**: _____PKR(روپے)	
B10	Which machinery and equipment were used on your farm in 2011? 2011میں آپ کے فارم پر کون سی مشینری یا زرعی آلات استعمال کیے گئے تھے۔ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Harvesting Bin) ہارویسٹنگ بن	Tractor ٹریکٹر ..... 1 Rotavator روٹا ویٹر ..... 2 Reaper ریپر ..... 3 Speed Drill سپیڈ ڈرل ..... 4 Sprayer Machine سپرئیر مشین ..... 5 Harvesting Kit ہارویسٹنگ کٹ ..... 6 Harvesting Bin ہارویسٹنگ بن ..... 7 Other (Specify) اس کے علاوہ کوئی (نام لکھیں)..... ( )	
B11	What are the main difficulties you face in the production of quality potatoes? اعلی قسم کے آلو کی کاشت اور پیداوار میں کس قسم ک مشکلات کا سامنا کرنا پڑتا ہے؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) ccess to credit) (قرض تک رسائی)	Availability of Certified seed مصدقہ بیج کی دستیابی ..... 1 Nutrient Deficiency غزائیت کی کمی ..... 2 Insects/pests attack مکوڑوں کا حملہ ..... 3 Attack of diseases بیماریوں کا حملہ ..... 4 Availability of tools & machinery ..... 5 مشینری و آ لات کی دستیابی Packaging material پیکنگ میٹیریل..... 6 Storage سٹو ریج ..... 7 Transportation نقل و حمل ..... 8 Marketing فروخت ..... 9 Access to credit قرض تک رسائی ..... 10 Precautionary measures for crop فصل کی حفاظتی تدابیر. 11 Increased charges of commission agent ..... 12 آڑھتی کمیشن زیادہ لیتے ہیں Increased cost of production زیادہ پیداواری لاگت ..... 13 Other (Specify) اس کے علاوہ کوئی (نام لکھیں)..... ( )	
B12	How did you finance the production	Self Financed خود برداشت کیے ہیں 1	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)	Skip
	cost of potato? آپ نے اپنے آلوکے فارم کے پیداوری اخراجات کیسے برداشت کیے ہیں۔ (Financial Institution) (مالیاتی ادارے سے)	Family/Friends خاندان/ دوست احباب سے .....2 Commission Agent/ Money Lender ساہوکارسے .....3 Large Buyer بڑے خریدار سے .....4 Financial Institution مالیاتی ادارے سے .....5 Other (Specify) اس کے علاوہ(وضا حت کر یں ..... ( )	1,2,3,4, Other ⇨ B15
B13	Please name the financial institution/s you used to access credit services for the cultivation of potato crop. آپ اپنے آلو کےکھیت میں کاشت کے لیے مالی قرضے کن مالیاتی اداروں /بنکوں سے حاصل کرتے ہیں؟	_____	
B14	Is financial institution supervised the loan? کیا ما لیا تی اد ارے نے قرض فراہم کرنے کے بعد اس کی نگرانی کی؟	Yes(ہاں) .....1 No(نہیں) 2	
B15	Are your finances sufficient to meet your crops production needs? کیا آپ کی مالی حالت فصل کی مناسب پیداوار حاصل کرنے کے لیے کافی ہے۔	Yes (ہاں) .....1 No (نہیں) 2	1⇨B18
B16	Would you like to receive credit services from financial institution? کیا آپ کسی مالیاتی ادارے سےقرض کی سہولت حاصل کرنا چاہتےہیں؟	Yes (ہاں) .....1 No (نہیں) 2	2⇨B18
B17	What is your requirement for credit for 2012? آپ کوسا ل ۲۰۱۲ کے لےکتنے قرض کی ضرورت ہے	PKR(روپے) _____	
B18	In the last 24 months (two years) did you receive any information on how to improve production of potato? کیا آپ نے پچھلے دو سال میں آلو کی پیداوار کو بہتر کرنے کے سلسلہ میں کوئی معلومات حاصل کیں؟	Yes (ہاں) .....1 No (نہیں) 2	2⇨B22
B19	From which source did you receive that information/training? (Multiple answers) نے یہ معلومات کن زرائع سے حاصل کیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Agriculture Department/Govt) (حکومت کے زرعی محکمہ سے)	Training received from Firms Project.....1 فرمز پراجیکٹ کی تربیت TV/Radio Program ٹی۔وی/ریڈیو پروگراموں سے .....2 Agri Dept./Govt حکومت کے زرعی محکمہ سے .....3 Farmer Cooperative فارمر کوآپریٹیو .....4 Friend/family/relatives .....5 دوست احباب/خاندان/ رشتہ دارں سے NGOs غیر سرکاری تنظیموں سے .....6 Other (Specify) اس کے علاوہ ..... ( )	
B20	You mentioned that you attended training; please specify which training you attended? آپ نے کہا کہ آپ نےتربیت میں حصہ لیا، واضح کیجئے کون سی تربیت میں حصہ لیا۔ - (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Access to credit) (قرض تک رسائی)	Better variety of potato بہتر اقسام کے آ لو .....1 Nutrient Management غزا ئیت انتظام .....2 Pest/insects management بیماریوں کا حملہ .....3 Management of diseases attacks بیماریوں کے حملہ کا انتظام 4 Irrigation methods آ بپاشی کا طریقہ کار .....5 Use of tools/machinery مشینری و آلات کا استعما ل .....6 Sorting, grading, packaging چھنٹائی، گریڈنگ، پیکیجنگ .....7 Storage سٹوریج .....8 Marketing فروخت .....9 Transportation نقل و حمل 10	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)	Skip
		Access to credit facilities قرض تک رسائی .....11 Other (Specify) (نام لکھیں) اس کے علاوہ کوئی..... ( )	
B21	Has the information/training you received changed your farming practices at all? کیا حاصل شدہ تربیت یا معلومات نے آپ کے باغبانی کے انداز کو بدل دیا ہے۔؟ (Not adopted good farming practices) (جدید انداز نہیں اپنایا)	Fully adopted good farming practices .....1 مکمل طورپرکاشتکاری کا جدید انداز اپنایا ہے Partially adopted good farming practices .....2 جزوی طور پر جدید انداز اپنایا ہے Moderately adopted good farming practices .....3 معمولی سا جدید انداز اپنایا ہے Not adopted good farming practices .....4 جدید انداز نہیں اپنایا Other (Specify) دیگر جوابات واضح کریں.....( )	**4⇨B23**
B22	If yes, what are you now doing differently because of the training? (Multiple answers) اگر آپ کا جواب مثبت ہے تو آپ کاشتکاری میں کیا مختلف کر رہے ہیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Access to credit facilities) (قرض تک رسائی میں بہتری)	Cultivating better variety of potato.....1 آلو کی بہتر اقسام کاشت کر رہے ہیں Improved selection of land Parcels…… .....2 کا شت کیلے بہتر زمین کا ا نتخا ب کر رہے ہیں Land preparation & sowing practices……. .....3 زمین کی تیاری اور بوائی کے بہتر طریقہ کار اپنا ٔے ہیں Improved nutrient management .....4 غذاییت کا انتظام بہتر کیا ہے Improved pests/insects management.....5 کیڑ وں کے حملہ سے بچا ٔوکا بہتر انتظام Improved irrigation methods.....6 آبپاشی کا بہتر طریقہ کار اپنایا ہے Improved use of tools/machinery .....7 مشینری و آ لا ت کا استعما ل بہتر بنا یا ہے Improved sorting, grading, packaging……. .....8 چھنٹائی، گریڈنگ، پیکیجنگ کا بہتر طریقہ کار اپنا یا ہے Improved storage سٹو ریج کا بہتر نظا م .....9 Improved marketing بہتر مواقع فروخت کے.....10 Improved transportation نقل و حمل کے بہتر مو اقع.....11 Access to credit facilities قرض تک رسائی کے بہتر مو ا قع .12 Other (Specify) دیگر جوابات واضح کریں..... ( )	
B23	Do you think you need any training in the future? کیا آپ سمجھتے ہیں کہ آپ کو مزید تربیت کی ضرورت ہے؟	Yes (ہاں).....1 No (نہیں).....2	**2⇨B25**
B24	If yes, what are the areas you on which you would like to receive training? (Multiple answers) اگر آپ کا جواب مثبت ہےتو آپ آئندہ کس شعبہ میں تربیت حاصل کرنا چاہتے ہیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Transportation) (نقل و حمل)	Cultivating better variety of potato..... 1 بہتر اقسام کے آ لو کی کا شت Nutrient management غزا ٔییت کا انتظام ..... 2 Pest/insects management کیڑ وں کے حملہ کا انتظام ..... 3 Management of diseases attack بیماریوں کا انتظام ..... 4 Irrigation methods آ بپا شی کا بہتر طر یقہ کار..... 5 Use of tools/machinery مشینری و آ لات کا بہتر استعما ل ..... 6 Sorting, grading, packaging چھنٹائی، گریڈنگ، پیکیجنگ.... 7 Storage سٹو ریج..... 8 Marketing فروخت..... 9	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)	Skip
		Transportation نقل و حمل..... 10 Access to credit facilities قرض تک بہتررسائی..... .11 Criteria for selection of appropriate land piece ..... 12 منا سب زمین کے ا نتخا ب کا طر یقہ کار Soil sampling and means for analysis..... 13 مٹی کے نمونے لینے اور تجزیہ کے لئےبہتر ذرائع Proper timings for sowing and harvesting of different cultivations and their specific needs..... 14 فصلو ں کی کٹا ئی اور بوائی کے مناسب اوقات اور ان کی ضروریات Other (Specify) اس کے علاوہ کوئی (نام لکھیں) ..... ( )	
B25	Do you maintain records of agricultural practices? کیا آپ زرعی طریقہ کار کے مختلف مراحل کا ریکارڈ رکھتے ہیں؟	Yes(ہاں) ..... 1 No(نہیں)..... 2	**2⇨B27**
B26	If yes, mention which record/s, do you maintain. اگر ہاں تو بتائیے آپ کیا کیا ریکارڈ رکھتے ہیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Export Records) (برآمدات کا ریکارڈ)	Financial Records مالی ریکارڈ..... 1 Sales Records فروخت کا ریکارڈ ..... 2 Crop production & management Records ..... 3 فصل کی پیداوار اور انتظام کا ریکارڈ Export Records برآمدات کا ریکارڈ ..... 4 Full-time Employment Records مُستقل ملازمین کا ریکارڈ...5 Temporary Employment Records ..... 6 عارضی ملازمین کا ریکارڈ Production records کا شت کا ریکا رڈ..... 7 Record for sowing and harvesting timings ..... 8 فصلو ں کی کٹا ئی اور بوائی کے مناسب اوقا ت کا ریکا رڈ Practices i.e. hoeing بھل استعمال کرنے کا طریقہ ..... 9 Inputs like agro-chemicals..... 10 فصل کی کا شت میں استعما ل ہو نے والی چیز یں (زرعی ادویا ت) Fertilizers and manures with time and quality..... .11 کھا د اور گوبر ڈالنے کے اوقات کار اور ان کی کوالٹی کاریکا رڈ Types of previous crops sown ..... `12 گز شتہ بوائی کی جانے والی فصلوں کی اقسام کا ریکارڈ Other (Specify) (اس کے علاوہ کوئی (نام لکھیں) ..... ( )	
B27	Please name other varieties of potatoes that you are interested in growing. (Multiple answers) آلو کی اُن دیگر اقسام کے نام لکھیے جنہیں اُگانے میں دلچسپی رکھتے ہیں۔ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Chips stock variety (Crozo)) چپس سٹاک قسم (کروزو)۔	a. Chips stock variety (Lady Rozetta) چپس سٹاک قسم (لیڈی روزیٹا) b. Chips stock variety (Hermus) چپس سٹاک قسم (ہرمس) c. Chips stock variety (Crozo) چپس سٹاک قسم (کروزو) d. Chips stock variety (Sterna) چپس سٹاک قسم (اسٹرن/سٹرنہ) e. Table potato variety (Raja) ٹیبل پوٹیٹو قسم (راجہ) f. Table potato variety (Roco) ٹیبل پوٹیٹو قسم (ریکو) g. Table potato variety (DiamontDiamont) ٹیبل پوٹیٹو قسم (ڈائمنڈ) h. Other (Specify) دیگر (واضح کیجئے)_____	
B28	Please tell us why you are interested in growing these varieties. براہ کرم بتائیے آپ ان اقسام کو اُگانے میں کیوں	Increased Production زیادہ پیدا وار..... 1 Increased Profit زیادہ منافع..... 2	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses ..... (جوابات/ردِعمل)	Skip
	دلچسپی رکھتے ہیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Availability of Seed) (بیج کی د ستیا بی)	Availability of Seed بیج کی دستیا بی..... 3 Expertise in Production کاشت کرنے میں مہارت / تجربہ..... 4 Increased market demand ..... 5 بہتر مارکیٹ/ منڈی میں آلو کی مانگ Increased weight of chips stock potato ..... 6 چپس سٹاک آلو کا وزن زیادہ ہونا Less problems with cultural practices, weeds, insects, diseases etc ..... 7 ثقافتی رسومات کے اپنا نے کی وجہ سے کم مسائل، جیسے کیڑوں کا حملہ، بیما ریا ں وغیرہ Other (Speciy) (اس کے علاوہ).....( )	

Remarks

Thanks for cooperating with me toward providing and sharing information. I will keep and respect the confidentiality of your responses. But let me ask you if you have any questions to ask me before conclusion.

میں معلومات کے تبادلہ پر تعاون کرنے پر آپ کا مشکور ہوں اور یقین دلاتا ہوں کہ میں آپ کے جوابات کو خفیہ رکھوں گا۔ لیکن انٹرویو ختم کرنے سے پہلے اگر آپ کسی قسم کا سوال پوچھنا چاہیں تو پوچھ سکتے ہیں۔

General Feedback from the Interviewer: انٹرویو کرنے والے کے عمومی تاثرات

?How to transport the production **پیداوار کی نقل و حمل کیسے کرتے ہیں**

? How to marketing the production **پیداوار کیمارکیٹنگکیسے کرتے ہیں**

---

etc (وغیرہ)

End the Interview: انٹرویو ختم کریں

(See your watch and enter) (گھڑی دیکھ کر وقت نوٹ کیجیے!)_____

Appendix 3: Peach Questionnaire

Swati Peach Sector Development Program–Baseline Survey: Peach Farmer Questionnaire

سواتی شفتالو سیکٹر ڈیولپمنٹ پروگرام
بیس لائن سروے: برائے اندراج شفتالو زمینداران

Questionnaire Number (For official use only) سوالنامہ نمبر (صرف دفتری استعمال کیلئے)					

USAID Firms Project– Swati Peach Sector Development Program
Farmers Baseline Survey Questionnaire
یو ایس ایڈ فرمزپراجیکٹ – سواتی آڑو سیکٹر ڈیولپمنٹ پروگرام
کسانوں کے بنیادی سروے سے متعلق سوالنامہ

Introduction:

Good Day/Morning/Afternoon! My name is _____. I/We come on behalf of the USAID Firms Project. We are carrying out a base line survey of the partner peach farmers in Swat district with the objective to assess their production, farm management and marketing practices. The focus of this survey is to assess farmers' access to inputs, tools and machinery, technical advice and training facilities, market information/linkages and access to credit facilities. The findings of this survey will help Firms Project to develop appropriate response strategies for better production and sales revenue.

تعارف:
السلام علیکم! میرا نام _____ ہے۔ میں/ہم یہاں فرمز پراجیکٹ کی طرف سے حاضر ہوئے ہیں۔ ہم ضلع سوات میں آڑو کاشتکاروں سے متعلق ایک بنیادی سروے کرنے آئے ہیں۔ جس کا مقصد ہے کہ ان کی پیداوار، کھیت کے انتظام اور مارکیٹنگ کے طریقوں کا تَعیُن کیا جا سکے ۔ اس سروے کیتوجہ ہے کہ کسانوں کی ان پٹ تک رسائی، آلاتاور مشینریتک رسائی، تکنیکی مشورہ اور تربیت کی سہولیات، مارکیٹ کی معلومات / رابطوں اور کریڈٹ کی سہولیات تک رسائی کا اندازہ لگانا ہے۔ اس سروے کے نتائج کسانوں کو بہتر پیداوار اور فروخت کی آمدنی کے لئے مناسب حکمت عملی تیار کرنے کے لئے مدد کرے گا

You, being a peach grower, were chosen for this interview based on your participation in the program through the respective peach cluster. You may choose to not answer the question that was put forward or stop the interview at any time you like.

آپ کیونکہ آڑو اگانے یا لگانے کی صلاحیت رکھتے ہیں، اورآپ نے اس پروگرام میں شمولیت کی درخواست کی ہے اس لیے آ پ کو اس انٹرویو کے لیے منتخب کیا گیا ہے۔ پھر بھی آپ جب چاہیں اس انٹرویو کو ختم کر سکتے ہیں یا جو آپ سے سوال پوچھا گیا ہے اس کا جواب نہ دینا چاہیں۔

All the answers are confidential. Your participation and the information you share with us won't affect your relationship with your community or Firms Project because whatever you are saying as a person won't be shared with others. Your name will not be quoted in the report. Your answers will not be judged either right or wrong.

آپ کے تمام جوابات صیغہ راز میں رکھے جائیں گے۔ آپ جو معلومات بھی فراہم کریں گے اس سے آپ کے کمیونٹی(متعلقین)یا فرمز پراجیکٹ کے اربابِ اختیار کے ساتھ تعلقات پر اثر نہیں ہوگا۔ کیونکہ آپ کے ذاتی خیالات دوسروں تک نہیں پہنچ پائیں گے۔ آپ کا نام رپورٹ میں نہیں آئے گا۔ آپ کے جوابات غلط یا صحیح کے پیمانے پر نہیں پرکھے جائیں گے

We are very grateful for your sincere answers. **Would you like to participate in this survey?**

ہم آپ کے جوابات کے لیے بہت بہت شکریہ کہتے ہیں! کیا آپ سروے میں شامل ہونا چاہتے ہیں؟

Start the Interview(انٹرویوشروع کیجیے)

(See your watch and enter)(گھڑی دیکھ کر وقت نوٹ کیجیے) _____

*If permission is given, begin the interview. If the respondent does not agree to continue, thank him/her and go to the next interview. Discuss this result with your supervisor for a future revisit***.**

نوٹ : اگر اجازت ملے، تو انٹرویو شروع کیجئے۔ اگر مدعا علیہ جاری رکھنے کے لئے رضامند نہ ہو، تو اسکا شکریہ ادا کیجیے اور اگلے کسان کی طرف جائیے۔ ان جوابات کو اپنے سپروائزر کے ساتھ ڈسکس کیجیے تاکہ آئندہ (دوبارہ ملاقات) کا فیصلہ کیا جا سکے.

Result of Interview: ویو کا نتیجہ *(to be completed at end)* (انٹرویو کےآخر میں مکمل کیا جائے گا)	Completed(مکمل)----------1 Refused to answer(جواب دینے سے انکار کر دیا) ----------2 Partly completed(جزوی طور پر مکمل) ----------3 Other (specify)_____ (وضاحت) دیگر

	Questionnaire ID (شناخت جواب دہندہ)	Response (جواب)	SKIP
ID10	Province Name: صوبےکا نام		
ID11	District Name: ضلع کا نام		
ID12	Village Name: گاوں کا نام		
ID13	Farmer's Cluster Name/#: کسان کے گروپ کانام/ نمبر		
ID14	Interview date: (DD/MM/YYYY) انٹرویو کی تاریخ		

ID15	**Interviewed by:** Name of Enumerator : شمار کنندہ کا نام (APEX Consulting) Date (DD/MM/YY)	_____ _____	
ID16	**Checked by:** تصدیق کنندہ Name of Supervisor نام سپروائزر (APEX Consulting) Date (DD/MM/YY)	_____ _____	

ID17	**Entered by:** ا ندراج کنند ہ Name of the Data Entry Operator نام ڈ یٹا انٹری آپریٹر (APEX Consulting)	_____	
ID18	**Checked by:** تصدیق کنندہ Name of the Data Entry Manager نام ڈیٹا انٹری منیجر (APEX Consulting): *(check questionnaire for completeness and assign sequential ID on top of this page data entry)* (تسلی کر لیں کہ فارم مکمل ہو گیا ہے۔ اور فارم کے اوپری حصہ پر ترتیب وار شناختی نمبر کا اندراج کریں)	_____	

Q#	Questions & Instruction (سوالات و ہدایات)	Responses.....(جوابات/ردِعمل)	Skip
A - Personal Information (ذاتی معلومات)			
A13	Respondent's Name: جواب دہندہ کا نام		
A14	Respondent's Father's Name: جواب دہندہ کی ولدیت		
A15	Respondent's CNIC #: جواب دہندہ کا کمپیوٹرائزڈ شناختی کارڈ نمبر		
A16	Sex of the Respondent: جواب دہندہ کی جنس	Male(مرد) ..... 1 Female(عورت) 2	
A17	Respondent's Age : (in completed years) جواب دہندہ کی عمر(سالوں میں)		
A18	Respondent's Education Level: (in completed years) جواب دہندہ کا تعلیمی معیار(سالوں میں)		
A19	Respondent's Phone / Cell Number: جواب دہندہ کا فون/ موبائل نمبر		
A20	Respondent's Email (if any) جواب دہندہ کا ای-میل ایڈریس (اگر ہو تو)		
A21	Complete Address of the Respondent: جواب دہندہ کا مکمل پتہ	Village(گاؤں) ..... UC(یونین کونسل)..... Tehsil (تحصیل) ..... District (ضلع)	
A22	Complete address of the Respondent's Peach Orchard: جواب دہندہ کے آڑو فارم کا مکمل پتہ	Village(گاؤں) ..... UC(یونین کونسل)..... Tehsil (تحصیل) ..... District (ضلع)	**SKIP if same as A9**
A23	Name of Alternate Contact person: نام برائے مُتبادل رابطہ (Write name of Peach orchard owner in case of Leased in as per B-1 below) (اگر زمین B-1 کے طور پر پٹے پر لی گئی ہےتو آلو فارم کے مالک کا نام لکھیں)		
A24	Contact/Phone # of alternate Contact person: فون نمبر برائے مُتبادل رابطہ		

Q#	Questions & Instruction	Responses	Skip
B - Peach Farm Information			
B29	Status of farm ownership فارم کی حیثیت ملکیت	Self-Cultivated خود کاشت کرتے ہیں.....1 Leased In پٹا/جارہ پر لیا ہے .....2 Other (Specify) اس کے علاوہ. .....( )	
B30	How do you manage your peach orchard? اپنے شفتالو کے فارم کا انتظام کس طرح کرتے ہیں؟	Self-managed خود انتظام کرتے ہیں.....1 Tenants کرائے پر.....2 Other (Specify) اس کے علاوہ .....( )	
B31	What is your source of irrigation water? آپ کے آبپاشی کےذرائع کیا ہیں؟	Tube well ٹیوب ویل.....1 River/Stream دریا / ندی وغیرہ.....2	

Q#	Questions & Instruction	Responses		Skip
		Spring بارانی.....3 Other (Specify) اس کے علاوہ .....( )		
B32	What is the distance and time taken from your farm to the main road? مین روڈ سے فارم کا فاصلہاوروقت کتنا لگتا ہے	_____KM کلومیٹر _____Hrs گھنٹے		
B33	Please mention the area (acres) and production (Kgs) under cultivation with fruit bearing peach trees (age 5 years or more). برائے مہربانی بتائیں کہ شفتالو کے۵ سال یا اس سے زیادہ عمر کے پھل دار درختوں پر مشتمل زیر کاشت رقبہ (جریب) اور پیداوار (کلو گرام)کتنا ہے	**2010** Jareeb(_____جریب) Kgs(کلو گرام) _____	**2011** Jareeb(_____جریب) Kgs(کلو گرام) _____	
B34	Please mention name of Peach variety with number of fruit bearing trees planted on your orchard? برائے مہربانی شفتالو کے پھل دار درختوں کی تعداد بلحاظ اقسام بتائیں؟ i. Trees of early green variety Early Greenقسم کے درخت ii. Trees of No.4 Peach variety شفتالو قسم نمبر 4 کے درخت iii. Trees of No.5 Peach variety شفتالو قسم نمبر 5کے درخت iv. Trees of No.6 Peach variety شفتالو قسم نمبر 6 کے درخت v. Trees of No.7 Peach variety شفتالو قسم نمبر 7 کے درخت vi. Trees of No.8 Peach variety شفتالو قسم نمبر 8 کے درخت vii. Trees of other variety (name) دوسری قسم کے درخت Total شفتالو کے درختوں کی کُل تعداد اور جریب	**2010** _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب	**2011** _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب _____ Kg _____ Jareeb کلوگرام جریب	
B35	How did you sell/market your peach produce in 2011? 2011 میں آپ نے شفتالو کی پیداوار کو کس طرح فروخت کیا	Self (خود فروخت کیا) ..... 1 Sub-contractor بیوپاری کے ذریعے فروخت کی) (..... 2 Other (Specify) اس کے علاوہ .....( )		**If 2, skip Bbc**
B36	What was the total cost of production of Peaches (Provide break-Up)? شفتالو کی کل پیداواری لاگت کتنی تھی ؟			

2010

Activity سرگرمی	Permanent labour مُستقل لیبر			Temporary labour عارضی لیبر			Family Labour خاندان لیبر		
	Qty تعداد	Days دن	Cost خرچہ	Qty تعداد	Days دن	Cost خرچہ	Qty تعداد	Days دن	Cost خرچہ
h) Input Costs **ان پٹ کی لاگت**									
i. Purchase of fertilizers کھاد کی لاگت	-	-		-	-	-	-	-	-

Q#	Questions & Instruction	Responses									Skip
	ii. Purchase of pesticides ادویات کی لاگت	-	-		-	-	-	-	-	-	
	iii. Purchase of white wash چونے کی لاگت	-	-		-	-	-	-	-	-	
	iv. Pruning شاخ تراشی کی لاگت										
	v. Irrigation آبپاشی پر لاگت										
	vi. Fertilizer کھاد ڈلوانےکی لاگت										
	vii. Spray سپرے کرنےکی لاگت										
	viii. White washing چونا لگوانے کی لاگت										
	ix. Others اس کے علاوہ										
	i) Harvesting and Post Harvesting Costs اُتارنے اور اُتارنے کے بعد کی **لاگت**										
	i. Purchase of Packaging material پیکجنگ مواد کی لاگت	-	-	-		-	-	-	-	-	
	ii. Picking اُتارنے کی لاگت										
	iii. Sorting and grading چھانٹ اور گریڈ										
	iv. Packing cost پیکنگ کی لاگت										
	v. Packaging cost پیکجنگ کی لاگت										
	vi. Loading on vehicle لوڈنگ کی لاگت										
	vii. Transportation نقل و حمل لاگت										
	viii. Unloading from vehicle گاڑی سے اُتارنے کی لاگت										
	ix. Munshiana مُنشیانا										
	x. Market Fees مارکیٹ فیس										
	xi. Commission کمیشن										
	xii. Others اس کے علاوہ										

2011

Activity سرگرمی	Permanent labour مُستقل لیبر			Temporary labour عارضی لیبر			Family Labour خاندان لیبر		
	Qty تعداد	Days دن	Cost خرچہ	Qty تعداد	Days دن	Cost خرچہ	Qty تعداد	Days دن	Cost خرچہ
j) Input Costs **ان پٹ کی لاگت**									
x. Purchase of fertilizers کھاد کی لاگت	-	-		-	-	-	-	-	-

Q#	Questions & Instruction	Responses									Skip
	xi. Purchase of pesticides ادویات کی لاگت	-	-		-	-	-	-	-	-	
	xii. Purchase of white wash چونے کی لاگت	-	-		-	-	-	-	-	-	
	xiii. Pruning شاخ تراشی کی لاگت										
	xiv. Irrigation آبپاشی پر لاگت										
	xv. Fertilizer کھاد ڈلوانےکی لاگت										
	xvi. Spray سپرے کرنےکی لاگت										
	xvii. White washing چونا لگوانے کی لاگت										
	xviii. Others اس کے علاوہ										
	k) Harvesting and Post Harvesting Costs اُتارنے اور اُتارنے کے بعد کی **لاگت**										
	xiii. Purchase of Packaging material پیکجنگ مواد کی لاگت	-	-	-		-	-	-	-	-	
	xiv. Picking اُتارنے کی لاگت										
	xv. Sorting and grading چھانٹ اور گریڈ										
	xvi. Packing cost پیکنگ کی لاگت										
	xvii. Packaging cost پیکجنگ کی لاگت										
	xviii. Loading on vehicle لوڈنگ کی لاگت										
	xix. Transportation نقل و حمل لاگت										
	xx. Unloading from vehicle گاڑی سے اُتارنے کی لاگت										
	xxi. Munshiana مُنشیانا										
	xxii. Market Fees مارکیٹ فیس										
	xxiii. Commission کمیشن										
	xxiv. Others اس کے علاوہ										

l) How many females were working on this farm in 2011?
اس فارم پر خواتین کی تعداد2011 میں کتنی تھی؟
Permanent (مُستقل)_____ Temporary(عارضی)_____ Family(خاندان)_____.

m) How many males were working on this farm in 2011?
اس فارم پرمرد کی تعداد2011 میں کتنی تھی
Permanent (مُستقل) _____ Temporary (عارضی)_____ Family(خاندان)_____.

n) How many average hours worked in one day?
ایک دن میں اوسط کتنے گھنٹے کام کیا؟
Males (مرد)_____ Females(خواتین)_____.Males (مرد)_____ Females(خواتین)_____.

Q#	Questions & Instruction	Responses		Skip
B37	What was your total income from sale of Peaches? شفتالو کی فروخت سے حاصل شدہ کُل آمدن	**2010**	**2011**	
		_____ PKR(روپے)	_____ PKR (روپے)	
B38	Which tools and machinery were used on your farm in 2011? 2011میں آپ کے فارم پر کون سی مشینری یا زرعی آلات استعمال کیےگئےتھے۔ (Multiple answers) (ایک سے زیادہ جواب ممکن ہیں) (Harvesting Bin) (ہارویسٹنگ بن)	Tractor (ٹریکٹر).....1 Rotavator (روٹیویٹر).....2 Manual sprayer(دستی سپرئیر) .....3 Power Sprayer(پاورسپرئی) .....4 Pruning Kit(پروننگ کٹ).....5 Harvesting Kit (ہارویسٹنگ کٹ) .....6 Harvesting Bin (ہارویسٹنگ بن).....7 Storage Bin (سٹوریج بن).....8 Other (Specify) اس کے علاوہ کوئی (نام لکھیں)..... ( )	
B39	What are the main difficulties you face in the production of quality potatoes? (Multiple answers) اعلیٰ قسم کے شفتالو کی کاشت اور پیداوار میں کس قسم کی مشکلات کا سامنا کرنا پڑا؟۔ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Access to credit) (قرض تک رسائی)	۱ Availability of Certified seed مصدقہ پودے کی دستیابی..... 1 Nutrient Deficiency غزائیت کی کمی..... 2 Insects/pests attack کیڑ وں کا حملہ ..... 3 Attack of diseases بیماریوں کا حملہ ..... 4 Availability of tools & machinery..... 5 مشینری و آ لات کی دستیابی Packaging material..... 6 Storage سٹو ریج ..... 7 Transportation نقل و حمل..... 8 Marketing فروخت..... 9 Access to credit قرض تک رسائی ..... 10 Precautionary measures for crop..... 11 فصل کی حفاظتی تدابیر Increased charges of commission agent ..... 12 آڑھتی کمیشن زیادہ لیتے ہیں Increased cost of production زیادہ پیداواری لاگت..... 13 Other (Specify) اس کے علاوہ ..... ( )	
B40	How did you finance the production cost of potato? آپ نے2011میں اپنے فارم کے پیداواری اخراجات کیسے برداشت کیے؟ (Financial Institution) (مالیاتی ادارے سے) (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں)	Self Financed خود برداشت کیے ہیں .....1 Family/Friendsخاندان/ دوست احباب سے .....2 Commission Agent/ Money Lender ساہوکارسے .....3 Large Buyerبڑے خریدار سے .....4 Financial Institutionمالیاتی ادارے سے .....5 Other (Specify) اس کے علاوہ .....( )	**1,2,3, Other ⇨B15**
B41	Please name the financial institution you used to access credit services for the peach orchard management in 2011. آپ اپنے شفتالو کےباغ کی نگہداشت کے لیے مالی	نام لکھیں _____ Other (Specify) اس کے علاوہ ..... ( )	

Q#	Questions & Instruction	Responses	Skip
	قرضے کن مالیاتی اداروں سے حاصل کرتے ہیں؟		
B42	Is financial institution supervised the loan? کیا ما لیا تی اد ارے نے قرض فراہم کرنے کے بعد اس کی نگرانی کی؟	Yes(ہاں) .....1 No(نہیں).....2	
B43	Are your finances sufficient to meet your orchard management needs for 2012? کیا آپ کی مالی حالت فصل کی مناسب پیداوار حاصل کرنے کے لیے کافی ہے؟	Yes(ہاں) .....1 No(نہیں).....2 Other (Specify) اس کے علاوہ..... ( )	**1⇨B18**
B44	Would you like to receive credit services for 2012? کیا آپ کسی مالیاتی ادارے سےقرض کی سہولت حاصل کرنا چاہتےہیں؟	Yes(ہاں) .....1 No(نہیں).....2	**2⇨B18**
B45	What is your requirement for credit for 2012? آپ کوسا ل 2012 کے لےکتنے قرض کی ضرورت ہے	PKR(روپے) _____	
B46	In the last 24 months did you receive any information/training on how to improve farming practices for management of peach orchard? کیا آپ نے پچھلے دو سال میں آڑو کی پیداوار کو بہتر کرنے اور شفتالو کے باغات کی بہتر منصوبہ بندی اور نگہداشت کے سلسلہ میں کوئی معلومات حاصل کیں؟	Yes(ہاں) ..... 1 No(نہیں).....2 Other (Specify) اس کے علاوہ..... ( )	**2⇨B23**
B47	From which source did you receive that information/training? (Multiple answers) نے یہ معلومات کن زرائع سے حاصل کیں؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Agriculture Department/Govt) (حکومت کے زرعی محکمہ سے)	Training received from Firms Project.....1 فرمز پراجیکٹ کی تربیت TV/Radio Program ٹی‌وی/ریڈیو پروگراموں سے.....2 Agri Dept./Govt حکومت کے زرعی محکمہ سے .....3 Farmer Cooperative فارمر کوآپریٹیو .....4 Friend/family/relatives.....5 دوست احباب/خاندان/ رشتہ دارں سے NGOs غیر سرکاری تنظیموں سے.....6 Other (Specify) اس کے علاوہ .....( )	
B48	What types of information/training have you received? آپ نے کس طرح کی معلو مات / تربیت حا صل کی ؟ (Multiple answers) (ایک سے زیادہ جوابات ممکن ہیں) (Access to credit) (قرض تک رسائی)	Pruning/training practices .....1 (شاخ تراشی کرنے کا طریقہ کار) Nutrient Management غزائیت انتظام .....2 Pest/insects management بیماریوں کا حملہ .....3 Management of diseases attacks بیماریوں کے حملہ کا انتظام 4 Picking(پکنگ یا چناو) ..... .5 Sorting and grading(چھانٹ اور گریڈ).....6 Packaging(پیکجنگ).....7 Storage(سٹو ریج).....8 Transportation(نقل و حمل).....9 Access to credit(قرض تک رسائی) .....10 Marketing(فروخت).....11 Other (Specify) اس کے علاوہ..... ( )	
B49	Has the information/training you received changed your farming practices at all? کیا حاصل شدہ تربیت یا معلومات نے آپ کے باغبانی	Fully adopted good farming practices ..... 1 (باغبانی کا مکمل طور جدید انداز اپنایا ہے) Partially adopted good farming practices..... 2	**4⇨B23**

Q#	Questions & Instruction	Responses	Skip
	کے انداز کو بدل دیا ہے۔؟ (Not adopted good farming practices) (جدید انداز نہیں اپنایا)	(جزوی طور پر جدید انداز اپنایا ہے) Moderately adopted good farming practices ....3 (معمولی سا جدید انداز اپنایا ہے) Not adopted good farming practices ..... 4 (جدید انداز نہیں اپنایا) Other (Specify) دیگر جوابات واضح کریں.....( )	
B50	What are you now doing differently because of the training? اگر آپ کا جواب مثبت ہے تو آپ باغبانی میں کیا نیا کر رہے ہیں؟ (Multiple answers) (ایک سے زیادہ جواب ممکن ہیں) (Improved access to credit) (قرض تک رسائی میں بہتری)	Improved pruning/training practices..... 1 (شاخ تراشی کا بہتر طریقہ کار) Improved nutrient management (غذاییت کا بہتر انتظام) .... 2 Improved pest/insects management ..... 3 (کیڑ وں کے حملہ کا انتظام) Management of diseases attacks (بیماریوں کا انتظام)..... 4 Improved picking(پکنگ کا بہتر طریقہ کار)..... 5 Improved sorting and grading ..... 6 (چھانٹ اور گریڈ کا بہتر طریقہ کار) Improved packaging(پیکجنگ کا بہتر طریقہ کار)..... 7 Improved storage(سٹو ریج کا بہتر طریقہ کار)..... 8 Improved transportation(بہتر نقل و حمل)..... 9 Improved access to credit(قرض تک رسائی میں بہتری)..... 10 Improved marketing(فروخت کا بہتر طریقہ کار)..... 11 Other (Specify) اس کے علاوہ .....( )	
B51	Are you interested in attending relevant trainings in future? کیا آپ مستقبل میں اسی طرح کی تربیت حا صل کر نا چا ہیں گے ؟	Yes(ہاں) .....1 No(نہیں) 2	**2⇨B25**
B52	If yes, what are the areas you on which you would like to receive training? (Multiple answers) اگر آپ کا جواب مثبت ہےتو آپ آئندہ کس شعبہ میں تربیت حاصل کرنا چاہتے ہیں؟ (Transportation) (نقل و حمل)	Pruning/training practices..... 1 (شاخ تراشی کرنے کا بہتر طریقہ کار) Soil sampling and testing for nutrient application..... 2 (مٹی کے نمونے لینے اور غذاییت کو چیک کرنے کا طر یقہ کار) Nutrient management (غزا ٔییت کا انتظام) ..... 3 Leaf analysis (پتوں کا تجزیہ)..... 4 Nutrient spraying (غزائی چھڑکا ٔو) ..... 5 Deficiency Symptoms (کمی کی علامات)……..... .6 Pest/insects management (کیڑوں کے کنٹرول کا انتظام)…. 7 Management form attacks of diseases (بیماریوں کا انتظام).8 Picking (پکنگ) ..... 9 Sorting and grading (چھانٹ اور گریڈ) ..... 10 Packaging (پیکجنگ) ..... 11 Storage (سٹوریج) ..... 12 Transportation (نقل و حمل) ..... 13 Access to credit (قرض تک رسائی)..... 14 Marketing (فروخت) ..... 15 Other (Specify) اس کے علاوہ .....( )	
B53	Do you maintain records of agricultural practices? کیا آپ زرعی طریق کار کے مختلف مراحل کا ریکارڈ رکھتے ہیں؟	Yes(ہاں) ..... 1 No(نہیں)..... 2	
B54	If yes, mention which record/s, do you	Financial Records مالی ریکارڈ..... 1	

Q#	Questions & Instruction	Responses	Skip
	maintain. اگر ہاں تو بتائیے آپ کیا کیا ریکارڈ رکھتے ہیں؟ (Multiple answers) (ایک سے زیادہ جواب ممکن ہیں) (Export Records) (برآمدات کا ریکارڈ)	Sales Records فروخت کا ریکارڈ ..... 2 Orchard management Records..... 3 (باغ کی پیدا وار اور انتظام کا ریکارڈ) Export Records برآمدات کا ریکارڈ ..... 4 Full-time Employment Records مُستقل ملازمین کا ریکارڈ... 5 Temporary Employment Records ..... 6 عارضی ملازمین کا ریکارڈ Production records کا شت کا ریکا رڈ..... 7 Times and types of insects……..8 (کیڑوں کی اقسام اور ان کے حملہ کے اوقا ت کا ریکا رڈ) Types and quantities of agrochemical used..... 9 (زرعی ادویات کی تعد اد اور ان کی اقسام کا ریکا رڈ) Other (Specify) کوئی اور بات واضح کیجئے ..... ( )	
B55	You want to increase growing area of Peach? کیا آپ مزیدرقبہ پر شفتالو اُگانا چاہتے ہیں؟	Yes(ہاں) ..... 1 No(نہیں)..... 2	

Remarks

Thanks for cooperating with me toward providing and sharing information. I will keep and respect the confidentiality of your responses. But let me ask you if you have any questions to ask me before conclusion.

میں معلومات کے تبادلہ پر تعاون کرنے پر آپ کا مشکور ہوں اور یقین دلاتا ہوں کہ میں آپ کے جوابات کو خفیہ رکھوں گا۔ لیکن انٹرویو ختم کرنے سے پہلے اگر آپ کسی قسم کا سوال پوچھنا چاہیں تو پوچھ سکتے ہیں۔

General Feedback from the Interviewer: انٹرویو کرنے والے کے عمومی تاثرات

?How to transport the production **پیداوار کی نقل و حمل کیسے کرتے ہیں**

? How to marketing the production **پیداوار کیمارکیٹنگکیسے کرتے ہیں**

---

etc (وغیرہ)

End the Interview: انٹرویو ختم کریں

(See your watch and enter) (گھڑی دیکھ کر وقت نوٹ کیجیے!)_____

Appendix 4: References

- Currency exchange rate from April to September 2010 and 2011.www.oanda.com
- Afghan Jerib system for the measurement of land in Swat i.e. 1 acre = 2.0234 jeribs. http://en.wikipedia.org/wiki/Jerib

USAID Firms Project
info@epfirms.com