USAID FIRMS PROJECT

Market Demand Analysis of Trout Fish

March 2012

This publication was produced for review by the USAID. It was prepared by Abdul Razzaq Saleemi and Umar Hayat for an assignment commissioned by Chemonics International under the USAID Firms Project.

USAID FIRMS PROJECT

Market Demand Analysis of Trout Fish

Data Page

Contract Number:	GBTI II Task Order No. EEM-4-07-07-00008-00
Contractor Name:	Chemonics International, Inc.
Name of the Component:	Value Chain Development (VCD)
USAID Technical Office:	Office of the Economic Growth and Agriculture; USAID Pakistan
Date of Report:	March, 2012
Document Title:	Market Demand Analysis of Trout Fish
Author's Name:	Abdul Razzaq Saleemi Umar Hayat
Editing:	Saleem, M.
SOW Title and Work Plan & Action ID:	SOW# 1796, Work plan level: 42120, Work plan ID# 15, Action ID# 5484
Project Area:	Islamabad/Rawalpindi; Lahore; Karachi; Peshawar; Swat district, Pakistan
Key Words:	Cold Chain, Exporters, Eyed eggs, Fish, Fish eating pints, Fish feed, Fish husbandry, Fish markets, Fresh water, Wholesalers, Fisheries, Grow out, Hatchery, Hazard analysis and critical control points (HACCP), Large Hotels, Marine, National market, Processing, Production, Restaurants, Super Stores, Swat, Trout Fish.

Abstract

The Malakand Division of Pakistan's Khyber-Pakhtunkhwa (formerly Northwest Frontier Province) was badly affected by militant insurgency in 2007 and 2008, and the Pakistani military's response in 2009. In addition to considerable loss of life, significant damage was done to the public and private infrastructure of the area, and there was incredible disruption to the daily lives of internally displaced persons (approximately three million people) and to the economies of the division.

The Provincial Relief, Rehabilitation, and Settlement Authority (PaRRSA) was established by the Khyber-Pakhtunkhwa Government to drive the recovery effort and provide a "one window" facilitation point to the Federal/Provincial Governments, donors and partner organizations. USAID Pakistan Firms Project aims to improve government services delivery and develop dynamic, internationally competitive firms to accelerate sales, investment and job growth to undercut the basis of extremism.

Firms Project private sector recovery efforts in collaboration with PaRRSA focuses on direct support in the form of grants, technical assistance and in-kind procurement to the conflict/flood affected businesses in Swat tourism and fishery sector to help them rehabilitate their businesses. The program is providing construction materials, operating equipment; production inputs, grant funds, and technical assistance to help over SMEs recover in tourism and fishery sector by end of the project. Firms Project provided cash grants and in-kind supplies worth USD 2.9 m to 261 businesses (239 hotels and 22 fish farms) in Swat to help them recover and rehabilitate their businesses.

Acronyms

DSC	Defense saving certificate
FGD	Focus group discussion
Firms Project	USAID/Pakistan funded project
HACCP	Hazard Analysis and Critical Control Points
KPK	Khyber Pakhtunkhwa
mandi	Whole sale market
PaRRSA	Provincial Relief, Rehabilitation, and Settlement Authority
PKR	Pak Rupees
SOW	Scope of Work
SSC	Special Saving Certificate
TFF	Trout Fish Farms
TV	Television
USAID	United States Agency for International Development
ZTBL	Zarai Taraqiati Bank Limited

Table of Contents

List of Tables

List of Figures

Exchange Rate

1 USD = 88.2352 PKR

Executive Summary

Fisheries sector is one of the main economic sectors in Swat district, which was badly affected due to the turmoil in the region caused by militants. According to a report by the KPK Fisheries Department, in 1994 there were 38 private farms cultivating rainbow trout in KPK Province and 23 were located in Swat. The Estimated total farmed production of rainbow trout in KPK in 1994 was 162 metric tons, with 60 metric tons (nearly 40%) coming from Swat's fisheries. The revenue in 1994 from the sale of market-sized fish in Swat was estimated to be about Rs. 24 million (USD 272,000). A business census[1] of the private trout farms in Swat by Firms Project in early 2010 identified that by 2006, just before the escalation of extremist militancy, the annual farmed production of rainbow trout in Swat had dropped from 60 metric tons to an estimated 40 metric tons. By the end of 2007 production had nearly come to a complete stop.

USAID Firms Project developed the business recovery plans and provided construction material worth USD 127,108 to fish farms for construction of raceways/infrastructure. However, the July 2010 floods largely destroyed trout fish farms (TFFs), which had started rehabilitation of their farms with USAID support in early June 2010, with end September 2010 as completion deadline. The financial losses to the fishery sector[2] were approximately PKR. 26 million.

PaRRSA and USAID have received many requests for expanding the support to private sector TFFs in Upper Dir, Shangla and Chitral districts of Malakand. However, before considering further expansion of support to aquaculture sector, USAID and PaRRSA are interested to know market demand for trout fish and its value added products in the local and domestic market[3], analyzing commercial scale production targets. The study has also reviewed different components of trout fish value chain including production, harvesting, processing, & marketing.

The purpose of the study was to assess market demand and price premium of Swat trout fish and its value added products in local and domestic market. The geographic area of the study was the target market segments[4] in provincial capital cities of Peshawar, Lahore, Karachi and Islamabad/Rawalpindi, besides Swat district. The methodology adopted to undertake the study included review of relevant literature, background meetings, preparation of work plan for the assignment, development of research design and tools including questionnaire and outline for focused group discussion (FGD) meeting, pre-testing of tools, training of enumerators on tools, collecting information about the large buyers/sellers of fish, conducting interviews and FGD meeting at district level and FGD meeting with Swati farmers to assess progress on rehabilitation of fish farms with current and potential production capacities and market linkages for sale of trout fish. Some of the important findings are listed below:

i. Seafood including fish is a major source of nutrition and contributes to the food security and poverty alleviation. According to FAO data that, Pakistan's fish consumption is 1.89 kg per capita per year, compared to the world average of 16.69 kg per capita in 2007. Taking this average figure and population estimates for 2011, fish consumption requirements for cities studied comes to 61354 metric tons and 332,000 metric tons for Pakistan, perhaps due to lack of available infrastructure for harvesting and handling fish, and how that affects the quality of fish available in the market.

ii. The study reveals that there are four major types of marketable fish in domestic market namely fresh water, marine, imported and trout fish. More than half of market segments

[1] *USAID Firms Project Swat Fisheries Sector census, March 2010*
[2] *Rapid flood damage assessment of aquaculture sector Swat (August 2010)*
[3] *Five major cities across three provinces i.e. Peshawar, Islamabad/Rawalpindi, Lahore and Karachi*
[4] *Large hotels, restaurants, fish markets and fish eating points, super stores etc. identified in each city*

viewed that fresh water fish with lowest price premium is mostly preferred by the customers, followed by marine fish, imported fish and trout fish.

iii. The availability and demand for types of fish varies from city to city. Fresh water fish is mostly preferred in Peshawar, Swat, while Marine fish is mostly favored by the consumers in Rawalpindi/Islamabad, Lahore and Karachi.

iv. Sixty forty (64) tons of marketable fish worth PKR. 38.4 million is currently available for sale[5] with eight trout fish farms, with the potential to increase up to 100 metric tons, whereas at its peak production for trout fish was around 60 metric tons per season. Recapturing this market depends on Swat tourism activities and tourist flow returning to its prior to the pre-conflict level. USAID and PaRRSA/TCKP through the Swat tourism promotion campaign are making efforts to revive the Swat tourism.

v. The economic impact of trout fish on one hand leads to increase in sales revenue for the concerned trout fish farms, besides creation of new jobs.

vi. Upon receiving post flood USAID support, partner TFFs have rehabilitated their raceways and made operational their businesses. The fish farmers reported an unprecedented fish growth as their fish stock reached marketable size in ten months against standard time of twenty months by using imported seed and feed.

vii. Gaps in production include certified disease free trout eyed eggs and pre-formulated trout fish feed, non-availability of trout egg hatching equipment and its accessories such as fish graders along with poor management of trout fish farmers.

viii. Post-harvest challenges in aquaculture sector include lack of proper fish handling and processing. Trout fish is raised in cold water and is a highly perishable commodity; it requires handling with care and chilled in appropriate temperatures. As equipment for chilling is not available, trout is usually placed directly on crushed ice, causing injury to its exterior and failing to maintain freshness and quality in fluctuating temperatures.

ix. No processing units are available in Swat and the production is too low to provide adequate quantity for process. Processing units established on the basis of existing production level will face a lack of supply because of an undeveloped aquaculture sector.

x. At the end of the value chain, flow of market information between local, national and global markets is low and trout farmers are unaware of price structures of fish in these areas. No formal links exist between trout producers and markets.

xi. Cold chain facilities such as freezers, flake ice machine or block ice brakeage machine, cold storage, chilling or blast freezing tunnel plants, freezer mounted vehicles for transportation of fish are essential in preserving the quality of fish from the point of capture to serving consumer. These facilities are not available in Swat and thus causing a major challenge to link Trout fish farms with the wider market.

xii. Swati trout fish, with comparatively higher prices, reached marketable size and is currently offered in few places in Swat and one superstore each at Islamabad and Lahore, while it is yet to be introduced in Karachi.

xiii. The demand for fish is the highest in winter season from October through February due to availability and freshness, and it tapers down during the summer months. Unlike other parts of the country, demand for trout fish increases during summer season, where tourists' influx is on the peak in Swat.

[5] *This is based on a conservative estimate of Rs.600/- per Kg, as most of the study respondents requested to buy trout fish at this rate.*

xiv. The sale price of fish varies according to type of fishes and their availability in a particular market. The average prices of fish[6] other than trout in market ranges between PKR.316 to PKR.661 per kilogram and for trout fish it ranges from PKR.1000 (on farm at Swat) to PKR. 1650 (Islamabad/Rawalpindi). The average price of the trout fish was Rs. 1350/- per kg as compared to other types of fish, which was on average Rs. 485/- per kg.

xv. Eight Swati trout fish have made their businesses operational with 64 metric tons marketable fish stock produced, which is more than 60 metric tons of fish stock used to be harvested per year before conflict. Trout famers have started their second production cycle and imported 550,000 trout fish eggs.

xvi. The Trout fish crop is also harvested in other areas of Malakand and Hazara Division due to better environmental conditions and fresh water sources. A total of 52 trout fish farms are operating mostly at subsistence level, in Malakand and Hazara Divisions with 74 metric tons marketable fish stock.

xvii. In domestic market demand is largely driven by cost and customer's preference from city to city, for example, marine fish is preferred in Karachi and fresh water fish is liked in other cities. The demand for trout fish in international market is driven largely by consumer perception of product quality, food safety and value addition. Strict adherence to food safety protocols and farm to market traceability are increasingly sought by consumers.

xviii. The annual demand for trout fish for market segment interviewed was 584 metric tons whereas the cumulative extrapolated demand[7] for trout fish was 2918 metric tons for target five cities of study with highest demand from super stores, followed by hotels and fish whole sale markets, fish eating points and restaurants. However, this would require a consistent supply of trout fish throughout the year at a competitive price along with a robust awareness campaign on its dietary benefits and taste.

xix. More than two-thirds of the respondents (70%) viewed to pay up to PKR. 600 per kg of trout fish, 15% informed to purchase it up to Rs.900 per kg while only 3% of respondents showed their willingness to pay even higher price than Rs. 900 per kg for purchase of trout fish. Only 13% of respondents did not show their willing to buy trout fish perhaps due to non-availability of required freezing facilities.

xx. The demand for trout fish does exist among the higher income groups who are willing to pay premium price, yet supply needs to expand considerably in order to sustain an export market.

xxi. There is a lack of legislation and rules regulating trout aquaculture production, processing, transportation and marketing. The final product is of questionable quality, since it will be lacking in proper quality inspection and certification, which in turn effects competition for trout fish in global markets. The Government has to play its role in implementing regulations and setting standards in a number of areas associated with trout fish farming and its processing to minimize potential hazards mainly environment related external factors. These factors include use of space, governance of the industry, food safety, animal health and research in appropriate areas as per requirement of the private sector. The implementation of these regulations will depend on technically trained staff and financial resources provided to strictly enforce these management protocols in handling of fish and its transportation for consumers.

---

[6] *The types of fish include marine finfish and other aquatic fisheries, such as shrimps, lobsters & crabs which cost high prices.*

[7] *The basis for extrapolation of demand is given in the methodology section 1.5 (k).*

The study recommends the following to address some of the gaps identified in trout production, processing and handling techniques:-

- Strengthen the capacity of various public and private sector departments through on-going training programs in best management practices, upgraded equipment and laboratories
- Provision of high quality inputs such as fish feed and fish seed to enhance trout production.
- Technical and material support to trout fish farmers in establishment and construction of fish processing set up on farms.
- Technical and material support to the Trout Fish Farmers Association on a cost-share basis.
- Investment in the development of cold chains from trout farms to the market
- Development of marketing linkages in high value market cities of Lahore, Islamabad, Karachi, Peshawar and other cities, where there are opportunities for the product to fetch a higher profit for local fish farmers.
- Continuous market price surveillance and flow of information from the market to the farmers.

The future of this growing trout sector could be secured, if the stakeholders[8] in the supply chain play their role towards sustainability of the sector as a whole. One part of the industry cannot achieve this alone. As the Swat fisheries sector would adapt a new market realities, structural adjustment would take place in the mindset of the trout farmers for re-training and adoption of new paths of developmental activities to remain competitive in their businesses as well its price. In particular small scale producers of trout fish would require access to finance, capacity building and technology transfer to be able to meet the requirement of national and export markets. Trout farming in an immense untapped resource and any future investment in trout value chain will yield enormous benefits over the long run in terms of job creation, food security and poverty alleviation.

[8] *Producers, transporters, processors and retailers, and Government institutions*

1. Introduction

1.1 Introduction

Aquaculture has been gaining an increasing importance in Pakistan's development policies[9]. The 2006 National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan[10] provide foundation for a supportive policy environment to help coordinate and leverage the efforts of key stakeholders to tackle the challenges that confront the sector. The goals of the policy are:-

- Increase the contribution of fisheries and aquaculture sectors to national economic growth
- Increase the contribution of fisheries/aquaculture sectors to poverty alleviation
- Increase the contribution of fisheries and aquaculture sectors to food security

To achieve these, the Government's underlying strategy is to increase national fish supply based on sustainable production and improved marketing of aquatic products. The creation of Fisheries Development Board and other development indices show a strong interest and willingness of the government to support the development and enhancement of production from aquaculture sectors.

Swat, much like the rest of KPK Province, is naturally endowed with an ideal physical environment and climate for farm cultivation of rainbow trout. Swat's trout culture has always been closely linked to its tourism industry. Swat's hotels and restaurants purchased cultured rainbow trout from the district's farmers and served the fish to tourists and affluent residents. The business required very little post-harvest processing, as the fish were usually purchased on site or transported live from grow out farms to onward sale points that served clusters of hotels in each of the main tourist areas. Discussions with farmers and review of reports suggest that at its peak local market demand was around 60 metric tons[11]. Recapturing this local market depends first and foremost on the local market actually returning (i.e. the revival of Swat tourism). It also depends on the ability of the private hatcheries and grow-out farms to complete reconstruction efforts currently underway, then to restore farm operations and the stock of marketable fish back to pre-conflict levels.

The Governments of United States of America and Pakistan came together to support the recovery of Swat. USAID has tasked its Firms Project to work with Provincial Relief, Rehabilitation, and Settlement Authority (PaRRSA) to implement small and medium sized enterprise rehabilitation activities geared towards accelerating sales, investment, and job creation in tourism and fishery sector in Swat. The Malakand aquaculture sector strategy has been developed followed by constitution of a Malakand Aquaculture Advisory Group (MAAG), consisting of key stakeholders from public and private sector to coordinate post flood aquaculture sector recovery and development initiatives.

1.2 Background

Fisheries sector is one of the main economic sectors in Swat district, which was badly affected due to the turmoil in the region caused by militants. In order to develop a post-conflict assessment of aquaculture related damages the Firms Project conducted a census of Swat's

---

[9] *2004 Poverty Reduction Strategy Paper (PRSP) of Pakistan*
[10] *National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan 2006*
[11] *Swat aquaculture sector recovery & development strategy –presentation by USAID Pakistan July 28, 2011*

private trout fisheries in March 2010[12][13]. The census determined that most of the private farms and hatchery facilities were damaged to some extent during the militant occupation of Swat and the resulting conflict. According to the census[14], out of 24 trout fish farms, five were operational while the rest were dormant. The census also determined that there had been no business activity in the sector since 2007, virtually all of the facilities required substantial repair, which provides an opportunity to help re-design some of the key production infrastructure according to technological advancements that had been developed in the industry since the original construction of farms in Swat.

Firms Project initiated its recovery program for Swat's trout farms in spring 2010. During May and June of the same year, Firms Project procured and delivered construction material worth USD 127,108 needed to complete facility-level repairs and renovations. However, as the renovation work got substantially underway at most of the farms, unprecedented levels of monsoon flooding hit the area in late July. The floods destroyed what was left of the farms and washed away most of the construction material that had not yet been put to use in reconstruction. After the floods Firms Project conducted a rapid damage assessment and determined that of the 22 farms that existed prior to flooding, eleven had been completely washed away, seven were severely damaged, and only four were largely intact and operational. The entire adult-sized fish stock of around 6,800 kg and over 100,000 fingerlings was completely washed away.

1.3 Financing Post-Conflict and Post-Flood Aquaculture Sector Recovery

As of January 2012, cash grants equaling USD 179,997 have been disbursed to 22 trout fish farms. The fish farms were provided construction materials, operating equipment, pre-formulated imported fish feed and fish eyed eggs worth USD 239,817. Ten training workshops have been conducted for fisheries sector to improve quantity and quality of produce, management and marketing linkages. Swat aquaculture sector recovery and development strategy[15] has been developed and industry advisory group has been formed. 178 full time jobs have been created in fisheries sector during the last one year, which includes 27 staff hired by fish farmers, while remaining 151 jobs construction related temporary jobs were created.

1.4 Objectives and Purpose

The purpose of this study is to assess production and market demand for trout fish and its value added products in local and domestic markets, analyzing the options and competitive advantage for its export as well as considering the commercial scale production targets. This research study was initiated to assess the market demand for trout fish in local and high value domestic market in selected cities of Pakistan, and its potential to play an important role in food security, poverty alleviation, and livelihood regeneration. The study findings will provide a basis for informed decision making on future investment, planning and development of the sector. The objectives of this study are:

- To undertake a survey of market demand for trout fish and its value added products in the local market in Swat and domestic market of Peshawar, Rawalpindi/Islamabad, Lahore and Karachi cities.

---

[13] *USAID Firms Project Swat Fisheries Sector Census, March 2010*
[14] *USAID Firms Project Swat Fisheries Sector census, March 2010*
[15] *Swat Aquaculture: Sector Recovery & Development Strategy)* Firms Project January 14, 2011)

- To assess the market segmentation of trout fish in various niche markets such as super stores, hotels & restaurants and fish markets.
- To identify the existing market value chain linkages in context of market demand of trout fish for its marketing within high value domestic markets.
- To assess the bottlenecks and constraints in the value chain and suggestive measurements to remove impediments in development & recommendations

1.5 Methodology

The geographic area of the study was the target market segments[16] in the provincial capital cities of Peshawar, Lahore, Karachi and Islamabad/Rawalpindi, besides Swat district. The methodology adopted to undertake the study consisted of the following:-

a) As a first step, the Consultants collected and reviewed relevant literature identified in scope of work. The literature reviewed is placed at Annexure-1.

b) The consultants also conducted background meetings with Firms Project key staff to understand scope of work and their perspectives regarding the study.

c) Based on the literature review and better understanding of scope of work and expectation of the client, the consultants prepared a work plan for the assignment, which was finalized in consultation with Firms Project.

d) The consultant developed research design consisting of detailed research methodology and tools both quantitative (questionnaire) and qualitative (outline for Focus Group Discussion (FGD) meeting. These research design and tools were also shared with Firms Project. The research tools are placed at Annexure-2. These include:
   - Appendix-1 to Annexure-2: Questionnaire for Interviews
   - Appendix-2 to Annexure-2: Outline for FGD meeting with Swati Trout Farmers.
   - Appendix-3 to Annexure-2: Outline for FGD meeting with stakeholders in target cities.

e) The consultant conducted a two days training workshop for five enumerators (one per district) on research tools in order to help them understand the methodology for data collection as well as quantitative questionnaire.

f) In the light of the scope, time and budget available, it was decided to conduct the research in three provincial headquarters (Peshawar, Lahore & Karachi), Islamabad/Rawalpindi besides Swat district. These cities have large population with mix of people from the entire provinces. A total of 126 interviews (25 per district) were conducted from key stakeholders selected based on geographic spread, type of market segment, their availability for the interview. The city-wise list of respondents and their database are placed at Annexure-3 with the following Appendixes. These include:
   - I. Appendix-1 to Annexure-3: Type of market respondents interviewed
   - II. Appendix-2 to Annexure-3: Status of respondents interviewed
   - III. Appendix-3 to Annexure-3: City-wise respondents interviewed
   - IV. Appendix-4 to Annexure-3: Database of respondents interviewed
   - V. Appendix-5 to Annexure-3: List of other stakeholders interviewed

[16] *Large hotels, restaurants, fish markets and fish eating points, super stores* etc. *identified in each city*

VI. Appendix-6 to Annexure-3: List of participants of FGD meeting with trout fish farmers from Swat

VII. Appendix-7 to Annexure-3: List of participants of FGD meetings at the district level

g) For an in-depth knowledge on research questions and issues highlighted in the survey and to obtain perspectives of the stakeholders, a Focus Group Discussion (FGD) meeting with stakeholders was held at each district (total 5 FGD/meetings). An FGD meeting with fish farmers from Swat was also held to assess progress on rehabilitation of fish farms with their current and potential production capacities and market linkages for sale of trout fish.

h) The study team also met with Swat Trout Fish Farmers Association, Processing/export companies, Fish Exporter Association, Commission agents besides, wholesalers, major retailers, super stores and large hotels and restaurants in selected cities of Pakistan.

i) The data collected was cleaned and entered into a database for tabulation and analysis. The data has been presented in the form of graphs and tables by means of frequencies, percentages and simple comparisons. The graphs are available in the text part of the report while tables are annexed to the report. For qualitative data from FGDs, manual analysis was carried out both from conceptual framework and considering notes of the FGDs. This information and analysis collected in the secondary research has been consolidated in the final report.

j) Cumulative assessment was carried out by taking into account total market segments under each category of stakeholders existed in each target city. The factor preferences showed by the respondents in each category and city was used to prepare cumulative demand for the cities studied.

k) The total number of hotels in the study districts was taken from Hotel and Restaurants Directory 2008-09 of Ministry of Tourism. The information on total number of fish wholesalers were collected from respective fishery association, while in case of superstore, it was assumed that for each of the 300,000 population, there is a superstore. This ratio was applied to all the five cities studied.

l) The researchers made an effort to ensure reliability and validity of research through a number of elements. The study protocols were developed and implemented in letter and spirit to minimize threats to validity and reliability. To ensure validity, it was considered to take a representative sample of the population and different market segments. Similarly, the data collection tools were developed after a thorough desk review to accurately get answers of the research questions. The same tools were used in all the three provinces and cities and same level of efforts were made to collect data simultaneously in all the provinces.

m) According to prevailing social and cultural value systems, acquiring business information especially sales and profits is discouraged by the businesses. This context necessitated development of strict guidelines for this study. All the participants were treated with respect and participation in the study was voluntary. Once briefed about the purpose of the study, informed verbal consent was obtained from all the participants prior to their participation. They respondents were also able to end their participation in the research at any time during the process. These efforts were made to ensure convenience and availability of the respondents.

n) The data collected is based on self-reported information by the respondents. The study team was neither mandated nor had luxury of time to verify partial or whole data reported by the respondents.

1.6 Structure of the Report

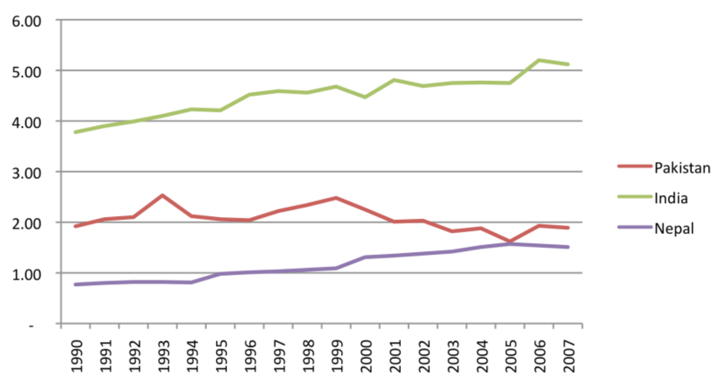
In addition to the preliminaries and executive summary, the report comprises of 3 chapters, an Annexure section with Appendixes to each Annexure. The first chapter introduces background, objectives and methodology of the study with particular reference to Swat and context/rationale for the study. It also highlights damages received by the fishery sector due to the conflict and 2010 floods and the support provided by the Firms project for rehabilitation of the trout fish farms in Swat. The second chapter analyses results of data collected and consultations held with the stakeholders. It provides information on current status of fish market and demand for trout fish and deals with findings of the study, which are based on the evidence derived from information collected through interviews and FGD meetings. Chapter 3 concludes the report and provides recommendations in light of the results of review. In order to accurately represent the proceedings of the study, Chapters 2 heavily rely on a number of appendices placed towards the end of this report. These chapters have been structured with a view to facilitate an essential understanding of the broader issues relevant to the study, while those interested in specific details may refer to the appendices for further clarity.

2. Study Results and Findings

Seafood including fish is a major source of nutrition and contributes to the food security and poverty alleviation. According to a 1993 study, fish consumption in Pakistan was among the lowest in the world at 2.53 kg per capita, compared to a world average of 13.45 kg per capita. A later study in 2001 reported that, not only was Pakistan's fish consumption still among the lowest in the world, it had decreased to 1.89 kg per capita per year, compared to the world average of 16.69 kg per capita.[17] According to FAO data, the trend in Pakistan's fish consumption since 2001 is essentially unchanged, as depicted in Figure-1 below:

Trends in South Asian Fish Consumption

Year	Pakistan	India	Nepal	World
1990	1.92	3.78	0.77	13.53
1991	2.06	3.90	0.80	13.03
1992	2.10	3.99	0.82	12.99
1993	2.53	4.10	0.82	13.45
1994	2.12	4.23	0.81	14.00
1995	2.06	4.21	0.98	14.94
1996	2.04	4.52	1.01	15.36
1997	2.22	4.59	1.03	15.41
1998	2.34	4.56	1.06	15.53
1999	2.48	4.68	1.09	15.63
2000	2.25	4.47	1.31	15.74
2001	2.01	4.81	1.34	16.08
2002	2.03	4.69	1.38	16.05
2003	1.82	4.75	1.42	16.16
2004	1.88	4.76	1.51	16.28
2005	1.62	4.75	1.57	16.46
2006	1.93	5.20	1.54	16.64
2007	1.89	5.12	1.51	16.69



Fish + Seafood, Food Supply Quantity (kg/capita/yr)
Source: Food and Agriculture Organization, FAOSTAT Database

Figure 1: Trends in South Asian Fish Consumption

Taking the average per capita per year consumption figures and population estimates for 2011, the average fish consumption requirements for the cities studied are given in Figure-2. The total fish consumption estimates for five cities surveyed comes to 61354 metric tons per annum, whereas total fish consumption estimates for whole Pakistan is approximately 332,000 metric tons per annum.

[17] *Reported figures were revised with official data from FAOSTAT. BNet Economic Review, 1993 & "Agri Overview", Pakistan. 2001*

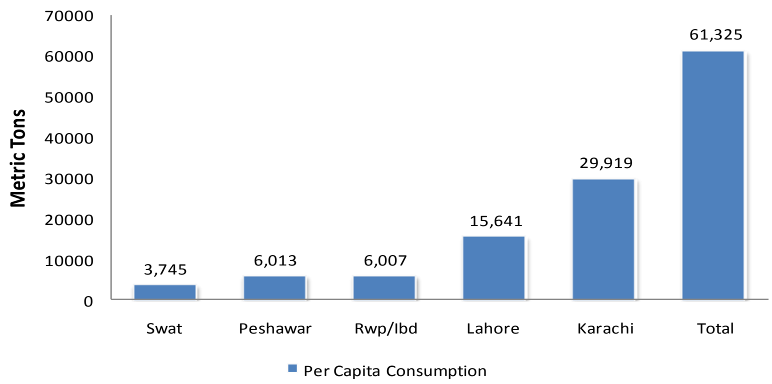


Figure 2: Per capita consumption per Kg/year

It is unlikely that the low level of fish consumption in Pakistan has to do with the average Pakistani's taste for fish. Rather it seems much more likely that it has to do with the lack of available infrastructure for harvesting, processing, transporting and storing fish, and how that affects the quality of fish available in the market. In the case of trout fish specifically, while all these general factors contribute to decrease in demand, trout is also relatively expensive and unaffordable to a large part of the population.

A case can be made that not only does the softness in demand for fish in Pakistan lead to low levels of domestic consumption, but it also constrains the ability of Pakistan's cultured fish producers to establish linkages with large export markets in the region. Becoming competitive in the export markets for Rainbow Trout requires an ability to perform against both quantity and quality standards, while simultaneously containing costs.[18]. In order for domestic suppliers, like Swat's cultured trout farmers, to eventually reach these export markets they first need to identify and learn to consistently supply to large domestic markets, like Karachi, Lahore, Islamabad, and Peshawar, where an increased demand for trout fish exists.

2.1 Major types of Fish

The study reveals that four major types of marketable fish are available for sale in domestic market. More than half of market segments viewed that fresh water fish with lowest price premium is mostly preferred by the customers, followed by marine fish, imported fish and trout fish as per Figure-3.

[18] *Swat Aquaculture Sector Strategy, USAID Firms Project, January 2011*

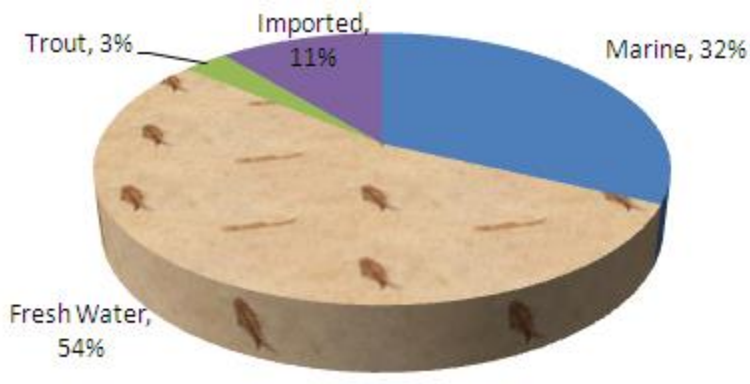


Figure 3: Type of fish provided to customers (%)

The availability and demand for various types of fish varies from city to city as per Figure-4 and summary reproduced as follows:-

a) Fresh water fish is mostly preferred in Peshawar, Swat, followed by Karachi, Lahore and Rawalpindi/Islamabad. The reason for its preference by consumers in almost all parts of the country is its ready availability, freshness and low price as compared to other type of carnivorous and marine fishes in various markets.

b) Marine fish is mostly favored by the consumers in Rawalpindi/Islamabad, followed by Lahore and Karachi while a small demand for marine fish exists in Peshawar and Swat markets. The bulk of marine fish landing at harbor is purchased by agents of the processing units for value addition and export purposes. A small quality of marine fish is sold in other parts of the country markets. The greater the size and weight, the higher the cost of the fish.

c) The fish Pangasius[19] is imported frozen in plastic bags with card board packing[20] (10 kg weight, of which 7.5 kg is fish fillet) from Vietnam. It is mostly liked by consumers in Karachi and Lahore because it does not contain any bony structure and no waste material with it. The wholesale price of imported fish at Karachi seaport is about Rs.1850, while the retail price varies from Rs. 2000 to 3000 per carton in various markets.

d) The Swati trout fish most recently reached marketable size and is currently offered in few hotels/restaurants in Swat and one superstore each at Islamabad and Lahore, while it is yet to be introduced in Karachi. The rates of the trout fish are much higher as compared to other types of fishes.

[19] *Pangasius Hypophthalmus*

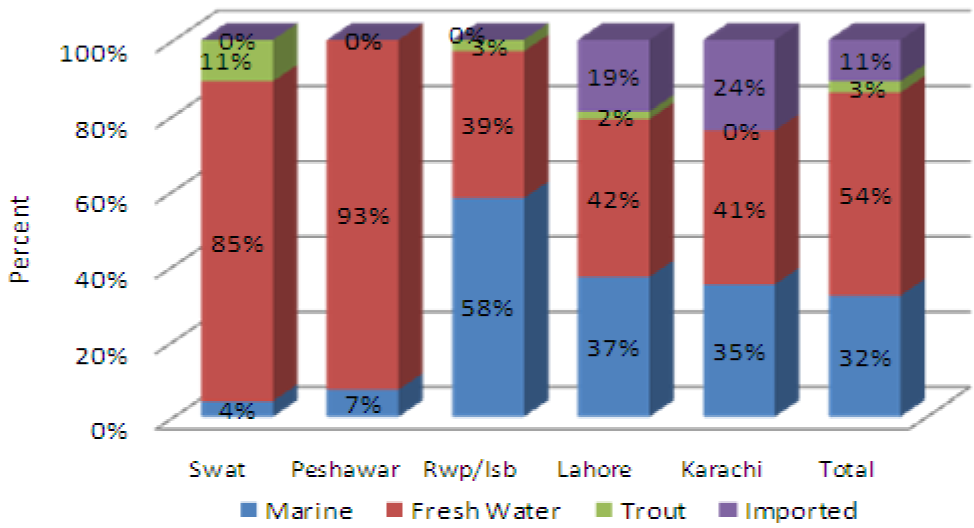


Figure 4: Major types of fish preferred by customers

2.2 Receipt of fish by sellers

Majority (44%) of large traders receive marketable fish stock at their businesses places. Another 34% of the respondents purchase and collect fish from fish *mandi*/wholesale market, 12% of respondents informed to purchase fish from super stores/retailers while only 10%, mostly in Swat reported to purchase fish from fish farms as per Figure-5 below. The city-wise break-up is exhibited in Figure-6.

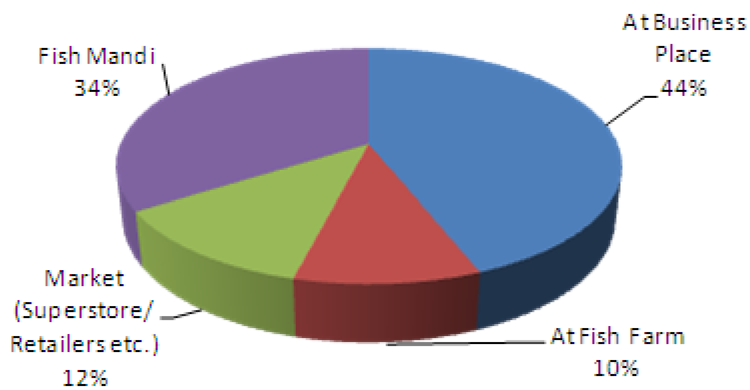


Figure 5: Receipt of fish by Large Traders- Total

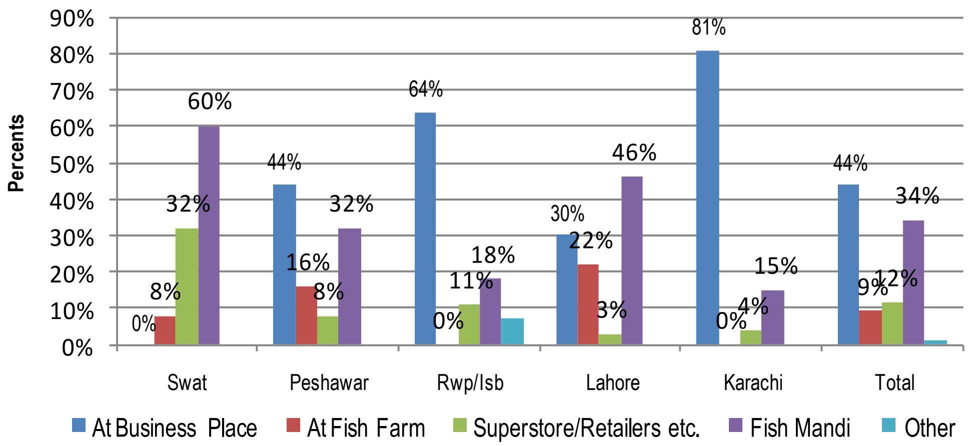


Figure 6: Receipt of fish by Large Traders- City wise break up

2.3 Raw and Cooked Fish Selling

More than half of the respondents informed that they sell uncooked fish in market whereas less than half of respondents representing hotels, restaurants and fish eating points informed that they are selling cooked fish to the customers as shown in Figure-7 below.

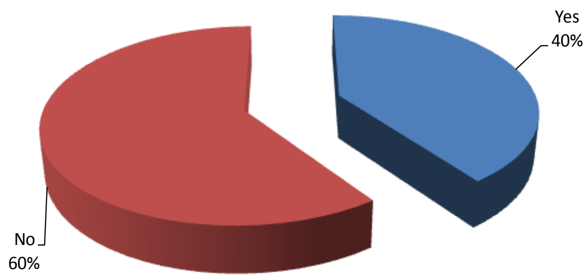


Figure 7: Sell raw (uncooked) fish

The city-wise break-up of cooked and un-cooked fish offered by different market segments is presented in Figure-8.

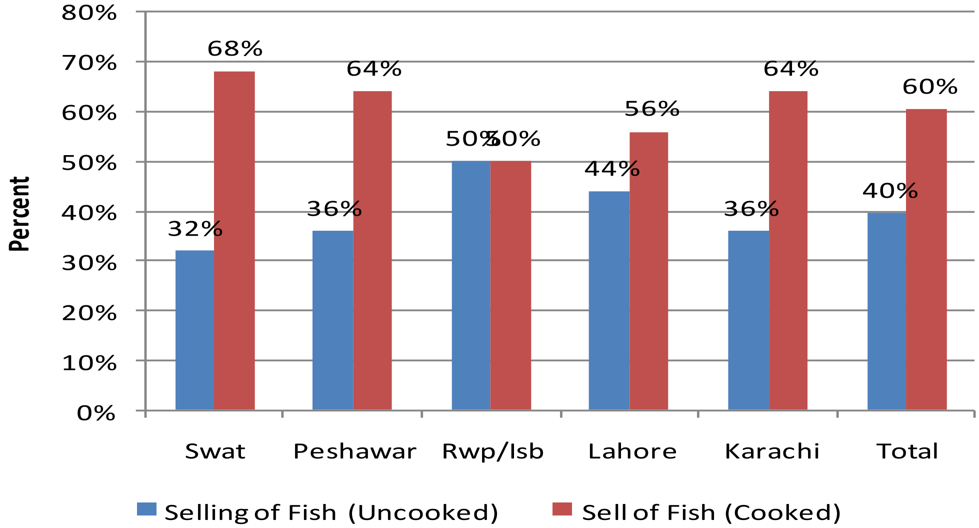


Figure 8: Selling of Fish (Cooked / Uncooked)

The above graph shows that in Swat, over two-thirds of the sellers sell cooked fish mostly to tourists, whereas in Karachi and Peshawar markets, almost two-thirds of sellers sell cooked fish. The ratio of selling cooked fish is higher than uncooked fish in Lahore and equal in Rawalpindi/Islamabad market.

2.4 Segment of Trout Fish market

The consumers are not a homogeneous group. Different groups of people have various likes and dislikes. Customers loyalty cannot be taken for granted for trout fish as their taste for trout fish is not developed and secondly they have different varieties of fish alternatives comparatively cheaper in cost offered in the market. Swati trout fish has recently arrived in local market in Swat and one outlet each in Islamabad and Lahore. The product is yet to be introduced at appropriate level in domestic high value market including superstore, food streets, restaurants and hotels etc. This is evident from the findings of study that majority (87%) of the respondents interviewed were not selling trout fish as they had no information about revival of trout fishery sector in Swat. A small quantity of trout fish is consumed by the tourists as well as local affluent population in all the cities except Karachi where trout fish is yet to be introduced. The city-wise details are placed at Figure-9.

The tourists visiting Swat valley are the best buyers of trout fish during the summer tourism season while its consumption by local affluent population is limited due to its comparatively high prices. The demand for trout fish will increase, once sufficient quantity of marketable trout fish at competitive rate is made available at different places in Swat and other cities with information to the people through an awareness campaign.

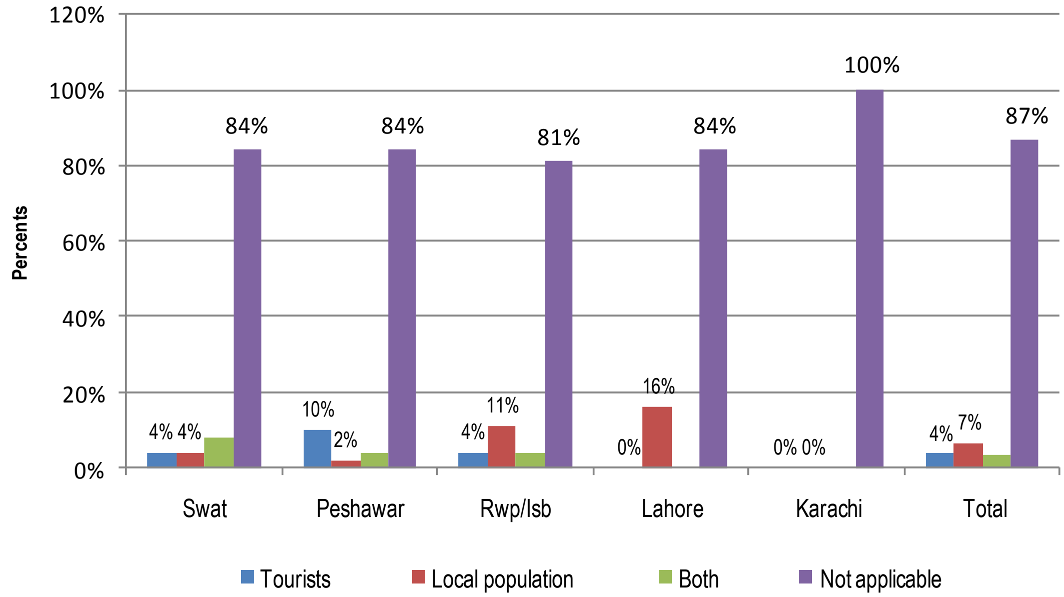


Figure 9: Buyers of Trout fish

2.5 Trout Production

Swat trout fish has been historically liked to tourism industry, and has a great potential to make significant contribution to Swat economy. Swat hotels/ restaurants used to purchase trout fish from local fish farms for serving to tourists and affluent residents. The fish stock was transported live to Madyan and Behrain based hotels/restaurants having ponds to retain live fish while it was transported in ice boxes to long distance areas in Swat and other districts for keeping its quality and freshness.

On receiving USAID support, eight Swati trout fish have made their businesses operational with 64 metric tons marketable fish stock produced, which is more than 60 metric tons of fish stock used to be harvested per year before conflict. As per conservative estimates, economic value of 64 metric tons fish stock is PKR.38 million[21]. The production of trout fish is likely to reach 100 metric tons in next few months as another eight trout fish farms have completed infrastructure rehabilitation and already started grow out of fish farms. In addition to this, four trout famers have started their second production cycle and imported 550,000 trout fish eggs. They have successfully completed hatching process. This would further increase production targets and sales revenue of concerned trout fish farms.

The Trout fish crop is also harvested in both in public and private sector in Upper Dir, Chitral and Shangla districts of Malakand Division and Mansehra, Battagram and Kohistan districts of Hazara Division. The environmental conditions and fresh water sources are suitable for production of trout in these districts, where the fish farming is mostly done at subsistence level. According to fisheries department KPK sources a total of 52 trout fish farms (44 private and 8 in public sectors) are operating in Malakand and Hazara Divisions with 74 metric tons marketable fish stock as per Annexure-4, Table-21. The trout fish is sold to hotels and restaurants, for

[21] *This value is based on sale price of Rs.600 per Kg of trout fish, whereas its current sale price varies between Rs.1000-1300 per kg*

selling to tourists and other people who can afford to buy it. The customers can also buy trout fish from public sector hatcheries at concessional rates as compared to open market rate.

Gaps in production include certified disease free trout eyed eggs and pre-formulated trout fish feed. Non-availability of trout egg hatching equipment and its accessories such as fish graders along with poor management of trout fish and lack of capacity of farmers themselves in terms of adopting modern methods of fish husbandry is a drawback as well. Low production of trout fish means few export opportunities, the current requirement of fish for export purposes is a minimum 28 metric tons of frozen fish, where production at the present stage is too small and minor to meet these demands. Production needs to be enhanced and improved to achieve a sustainable level of production and supply.

Post-harvest challenges in aquaculture sector include lack of proper fish handling and processing. Trout fish is raised in cold water and is a highly perishable commodity; it requires handling with care and chilled in appropriate temperatures. As equipment for chilling is not available, trout is usually placed directly on crushed ice, causing injury to its exterior and failing to maintain freshness and quality in fluctuating temperatures. Similarly, no processing or value added activities are attributed to trout fish. No processing units are available in Swat and the production is too low to provide adequate quantity for process. Processing units established on the basis of existing production level will face a lack of supply because of an undeveloped aquaculture sector. At the end of the value chain, flow of market information between local, national and global markets is low and trout farmers are unaware of price structures of fish in these areas. No formal links exist between trout producers and markets.

2.6 Trout Demand

The primary focus of the study is to assess demand for trout fish in various market segments and in major cities identified for the study. The data collected from the 126 respondents (25 per district) shows a demand of 584 metric tons for trout fish whereas cumulative demand worked out is approximately 2918 tons for five cities surveyed. Of this, the highest demand (36%) has been requested by the respondents from super stores category followed by hotels and fish whole sale markets (29% each), fish eating points (4%) and restaurants (2%) as per details given in Figure-10 and Figure-11 below.

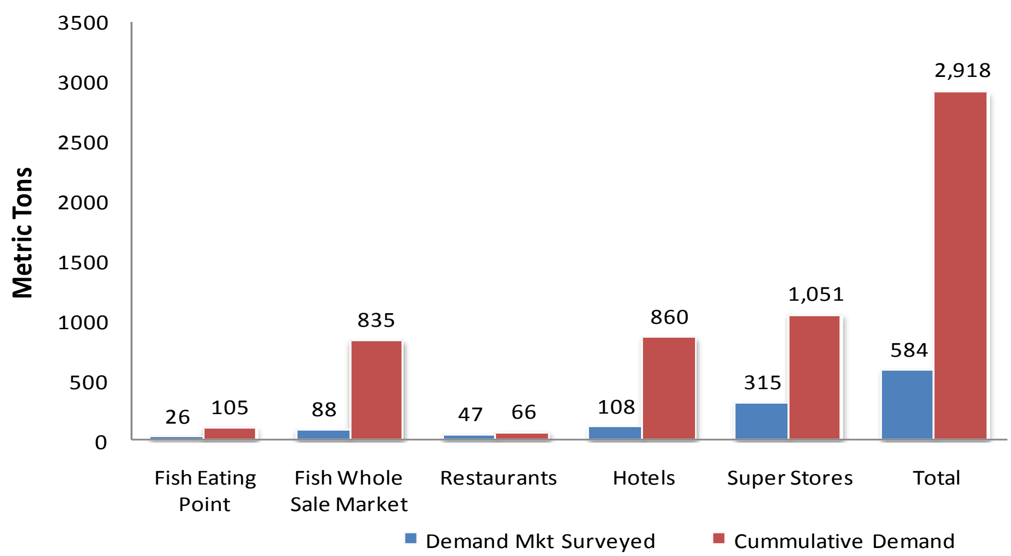


Figure 10: Annual Demand of Trout Fish (Surveyed vs. Cumulative)

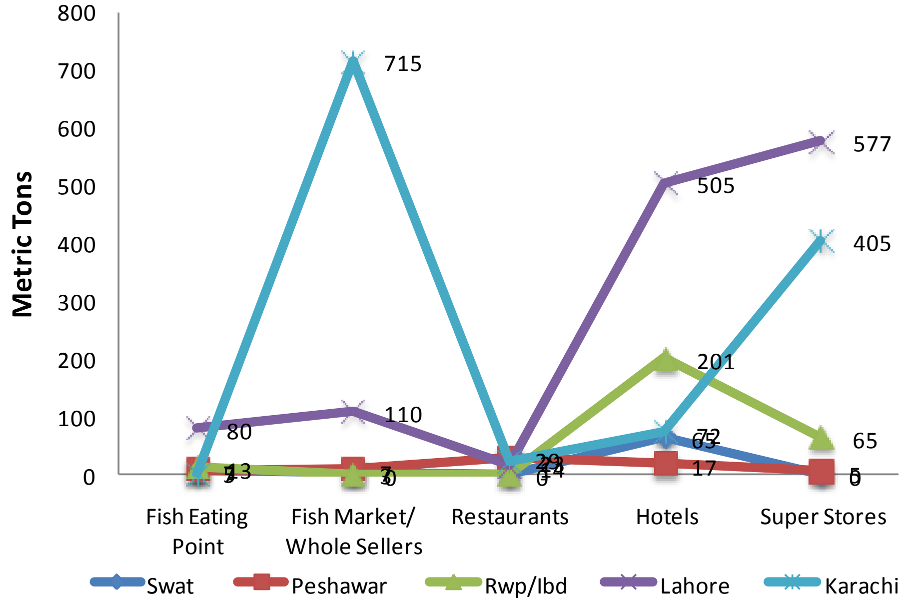


Figure 11: Annual Demand of Trout fish

The city-wise comparison of demand for trout fish requested by the respondents interviewed versus their cumulative demand is given in Figure-12 below, while the break-up of cumulative demand is exhibited in Figure-13.

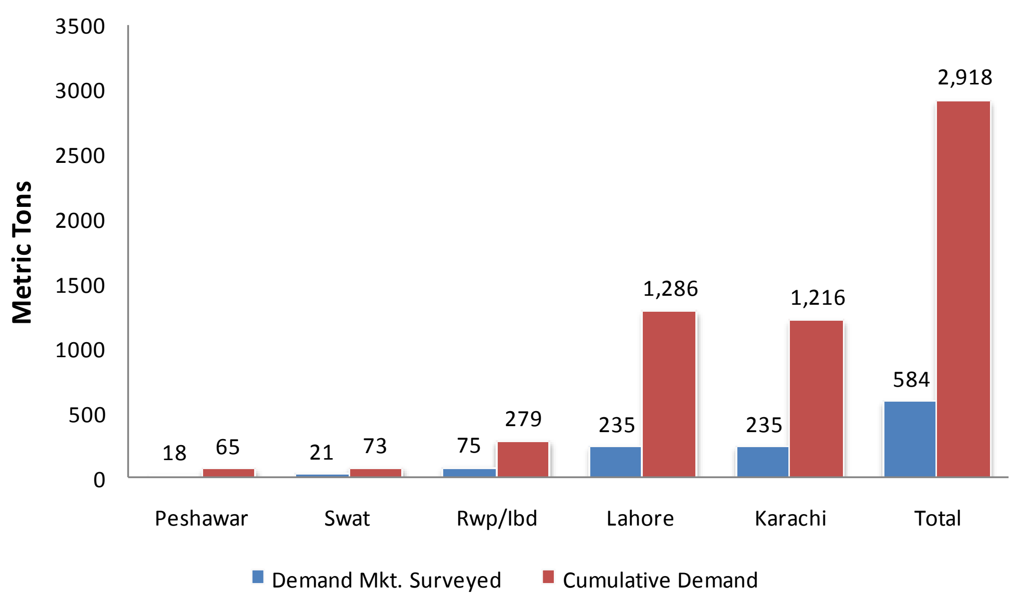


Figure 12: Annual demand of Trout Fish (Surveyed vs. Cumulative)

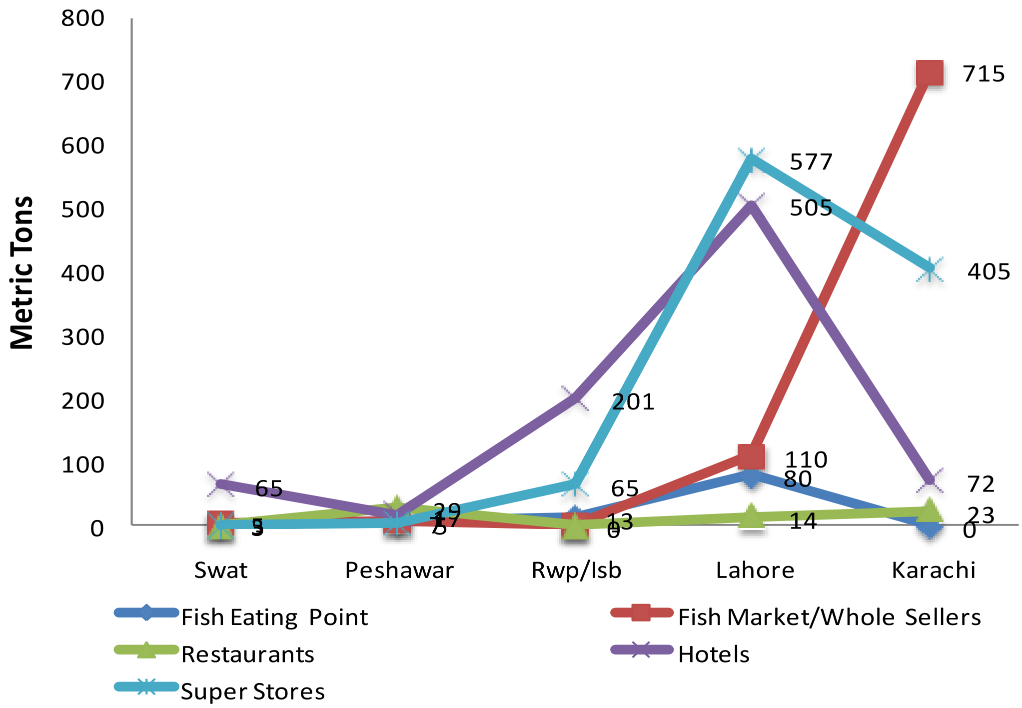


Figure 13: Break-up of cumulative demand of Trout Fish

The graph shows that annual demand for trout fish is highest in Lahore with 1286 metric tons, which comes to 44% of total demanded quantity of trout fish, followed by Karachi with 1216 tons or 42%. The collective demand of Rawalpindi/Islamabad is 279 metric tons or 10% of total demanded trout fish, whereas Peshawar and Swat districts each demanded 2% of total demanded quantity of trout fish.

The following findings were observed.

a) The economic benefits of Swat trout fish sector rehabilitation will be three folds a) Demonstration effect of trout fish cultivation is expected to spill over to local fish farmers b) Motivation generated would encourage farmers to invest in aquaculture sector and innovative trout culturing techniques that is environment friendly, sustainable and viable in local conditions c) Direct and indirect employment creation for local people as Upper Swat is a snow bound area and the labor force employed in agriculture remained idle during winter months. The economic impact of trout fish on one hand leads to increase in sales revenue for the concerned SMEs, besides creation of full time temporary and permanent jobs. The temporary jobs refer to the jobs created as a result of construction rehabilitation work on fish farms.

b) The large buyers informed that there is a lack of information on availability of trout fish in the market, its price and nutritional value to consumers, which affects their sales.

c) Demand for fish in international market is driven largely by consumer perception of product quality, food safety and price premium. Adherence to strict food safety protocols, and farm to market traceability for all the products are increasingly sought by international consumers and to some extent by domestic consumers. The customer's preference varies from city to city. For example, marine fish is preferred in Karachi while in other cities fresh water fish is favored.

d) Over the longer term, if domestic markets enable the development of commercial production capacities that are sufficiently large, consistent, and cost-effective, the regional and even global export markets, for trout fish and/or processed products, might become accessible.

e) A number of international certification standards[22] have emerged; however, Swati fish farms are not certified and even not aware about benefits of these standards and certifications. They lack knowledge and expertise in proper harvesting, handling, processing, branding and packing of trout fish and its value added products.

2.7 Seasonal Demand for Trout Fish

The demand for fish is the highest in winter season from October through February due to availability and freshness, and it tapers down during the summer months. One of the major reasons for low sale of fish in summer season is the perception of the customers not to eat fish in summer as it is rich in protein with warm effect on metabolism of body. Other reasons for low sale of fish in summer include high prices of fish due to insufficient quantity in market, because of its high perishable nature as cold chain systems are not in place. Secondly, the fish breeding takes place in summer season, where fish harvesting is not permissible.

The seasonal demand for trout fish across various market segments is shown in Figure-14 below. The data confirms that demand for trout fish in winter season is almost double than its demand in summer season. The demand for trout fish is highest by superstores due to the fact that superstores have by and large cold storage facilities available to keep the fish frozen.

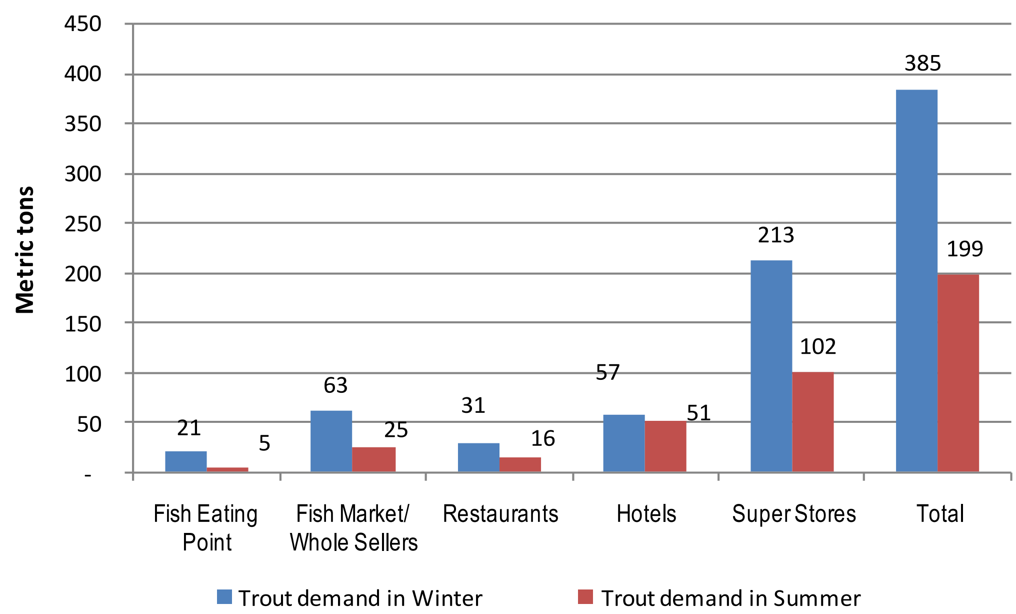


Figure 14: Demand of trout fish (Category-wise)

The city wise demand presents an interesting picture. Unlike other parts of the country, demand for trout fish increases during summer season, where tourists' influx is on the peak in Swat. The

[22] *These include World Wildlife Fund, ISO, Global Gap, HACCP, etc.*

tourists visiting Swat for recreation and leisure are usually willing to pay higher prices for trout fish. The city wise break-up of seasonal demand for trout fish is presented in Figure-15.

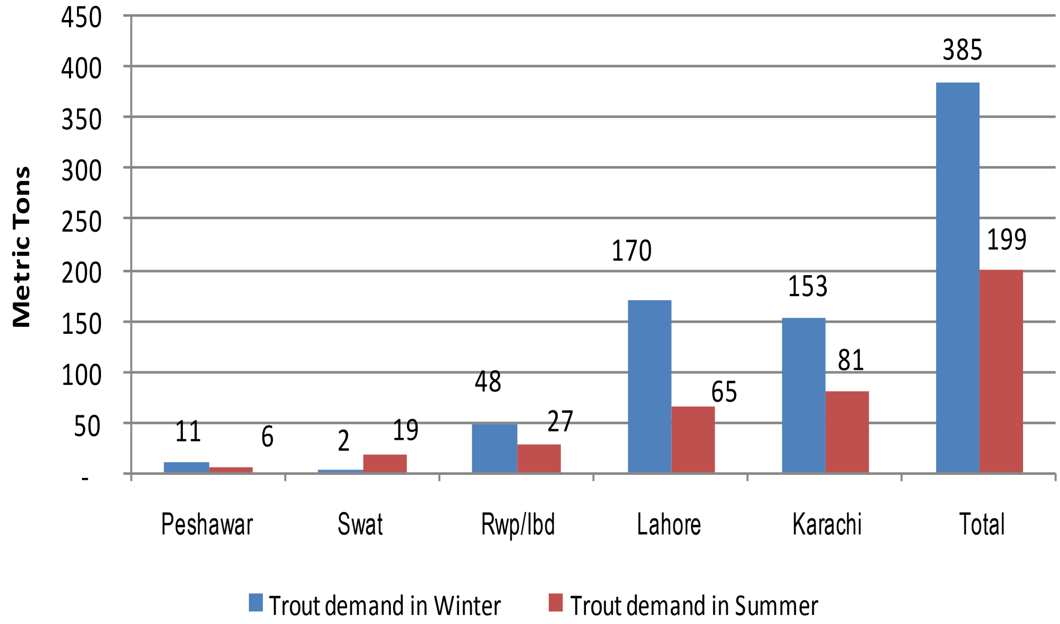


Figure 15: Demand of trout fish (City-wise)

The reasons for low sale of fish in summer season are given below in Figure-16.

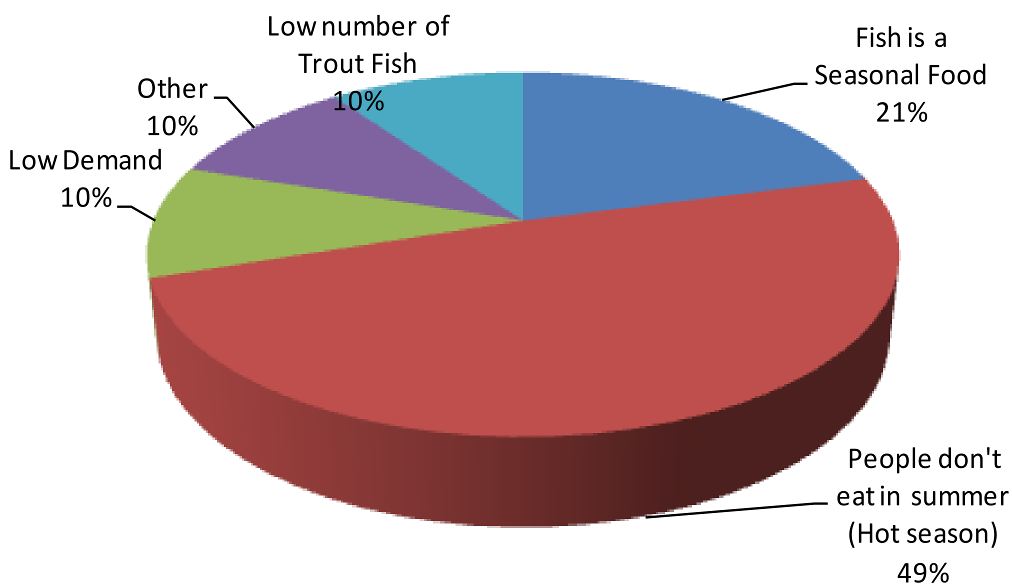


Figure 16: Reasons for low sale of fish in summer season

2.8 Price of Trout Fish

The price of one kilogram of degutted marketable trout is between Rs. 1000-1200 at farm gate. The fish outlet in Islamabad purchased trout fish for Rs.1300 per kilogram and is selling it for Rs.1650 per kilogram while another superstore in Lahore [redacted] is selling it for Rs.1450 per kilogram, which is much higher than fresh water and marine fish products available at these outlets. Despite this, there is still a demand for trout fish in domestic market. This is evident from the fact that majority of large buyers (70%) were ready to pay Rs. 600 per kilogram of trout fish, which is more than average maximum price per kilogram for other types of fish in national market. Another 14% of large fish buyers were willing to pay higher price of PKR. 900 per kilogram of trout fish, while 3% opted to buy trout fish for more than PKR.900 per kilogram. However, only 13% of the respondents were not willing to buy trout fish as they did not have required facilities to keep the fish frozen/chilled.

City wise break-up of respondents' who showed their willingness to buy trout fish at various rates is given in Figure-17 below. All the respondents in Karachi, viewed to purchase trout fish not greater than Rs.600 per kilogram, while 88% of respondents from Lahore showed their interest to buy trout fish for Rs. 600 per kilogram while 12% were ready to pay up to Rs. 900 per kilogram of trout fish. Similarly, trout is highly liked in Peshawar and Swat (being tourists station), where buyers were ready to buy more even more than Rs.900 for one kilogram of trout fish. A large number of respondents (62%) from Rawalpindi/Islamabad viewed not to buy trout fish without mentioning any reason.

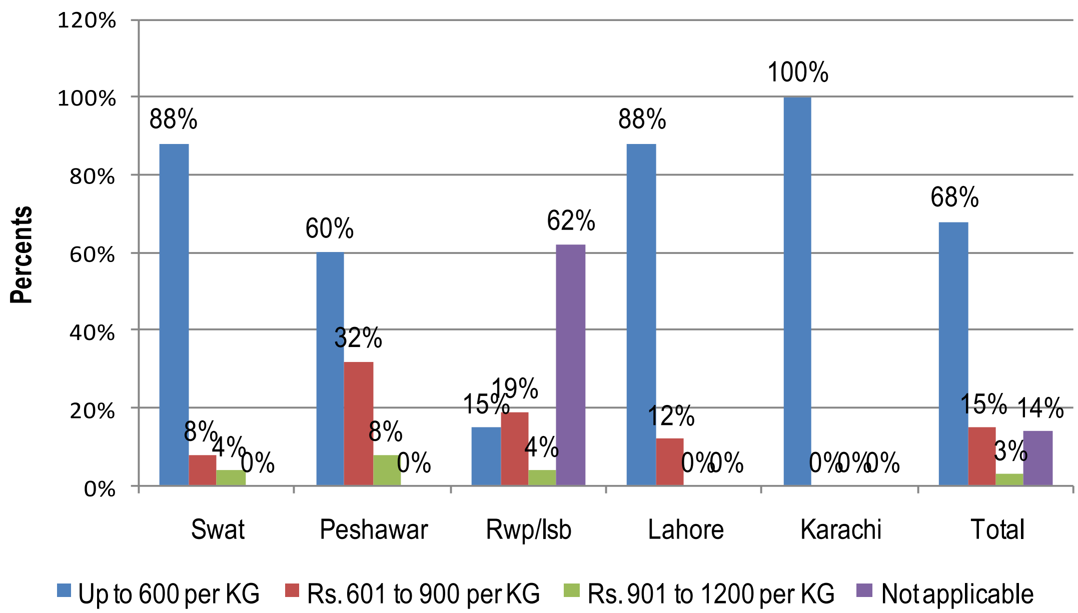


Figure 17: Rate currently ready to buy Trout fish

The following conclusions can be drawn from the above.

a) The price of trout fish is on much higher as compared to average price of other types of fish in domestic market, which limits its demand to only wealthy consumers in large cities and tourists'.

b) The highest price per kilogram of Swati trout fish is offered in Rawalpindi/ Islamabad markets perhaps due to the fact that most of rich population is living in these cities.

2.9 Price Comparison of Trout and Other types of fish

The sale price of fish varies according to type of fishes and their availability in a particular market. The average prices of fish[23] other than trout in market ranges between PKR.316 to PKR.661 per kilogram and for trout fish it ranges from PKR.1000 (on farm at Swat) to PKR. 1650 (Islamabad/Rawalpindi). The city-wise average prices per kilogram for trout fish and other types of fish are given below in Figure-18. The difference in sale price of fish is due to variations in transportation cost. The stakeholder viewed that prices of domestic markets of fish varies depending upon type and size of fish. The price of fish at the farm level is comparatively less than at a distant market where cost of transportation, handling and retailer margin is added to it. The following conclusions can be drawn from the trends of domestic prices of fish:

- Marine fish and fisheries products have on average, higher price than the local carp types of fish.
- Imported fish fillet of Pangasius is becoming a favourite product in the national fish market due to its boneless fish meat.
- The demand for fish is directly proportional to its price. Increase in fish price will adversely affect the demand for fish and vice versa.
- The demand of fish may change with the changes in income level of its purchasers.

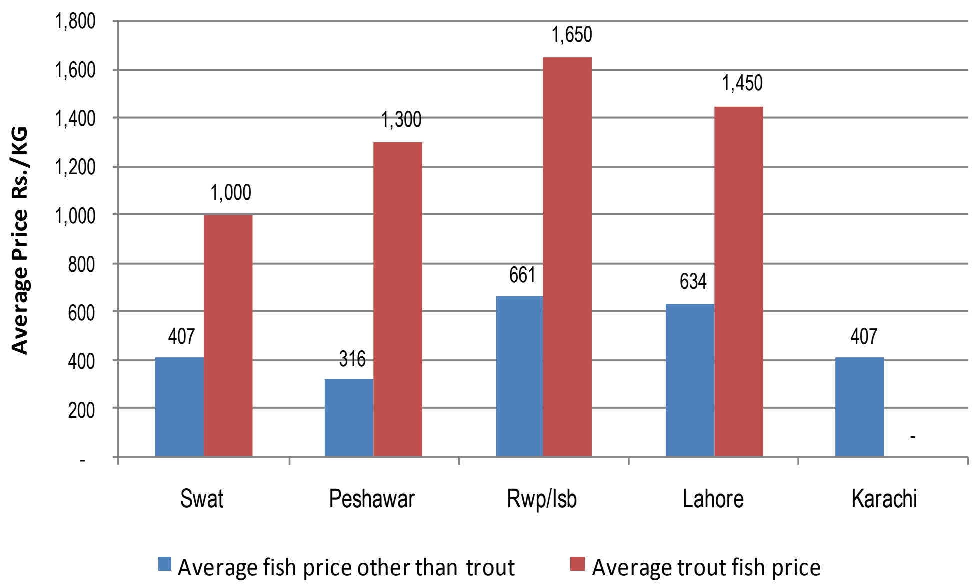


Figure 18: Prices of trout with average of others types of fish

2.10 Priority for buying trout fish in various forms

The trout fish can be marketed in different forms like whole gutted chilled ice packed, whole gutted frozen ice packed, and in fillets form etc. In Swat, marketable trout fish is mostly supplied and transported in frozen ice packed, while chillers and processing facility for making fillets are

[23] *The types of fish include marine finfish and other aquatic fisheries, such as shrimps, lobsters & crabs which cost high prices*

not available. Figure-19 shows city-wise preferences of the buyers to receive the trout fish in various forms.

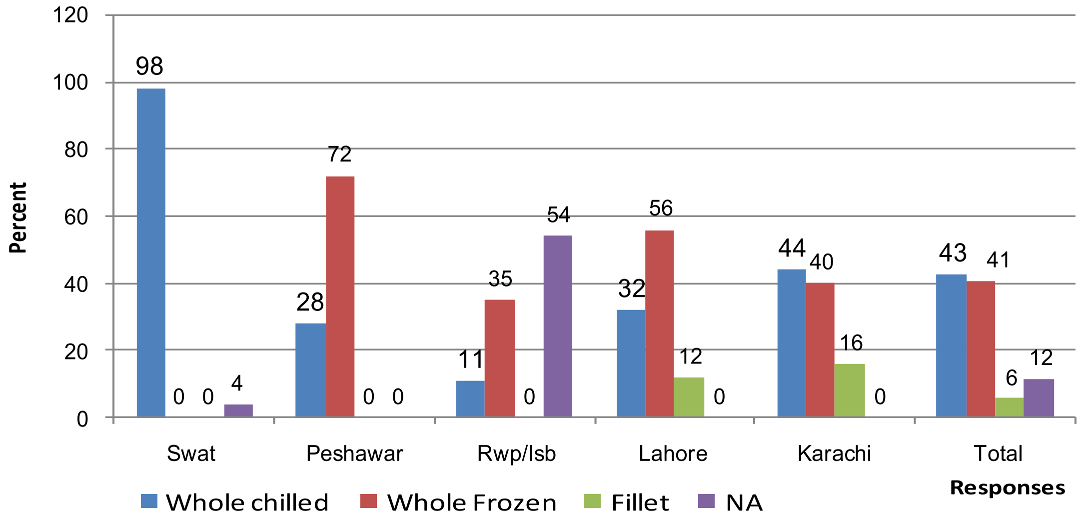


Figure 19: Priority of buying trout fish

Almost equal number of respondents showed their interest to purchase whole gutted trout fish in chilled and frozen ice packed forms, only 6% preferred to receive trout fish in fillet form while 11% were not interested to buy trout fish largely due to non-availability of freezing facilities at their outlets. 98% of the respondents in Swat choose to receive trout fish in whole gutted chilled form, whereas 72% of buyers in Peshawar preferred to receive trout fish in whole gutted frozen ice packed form. Only 12% and 16% of respondents interviewed in Lahore and Karachi viewed to receive trout fish in fillet form.

2.11 Packing of Trout Fish

The experience shows that packaging and proper presentation of products plays an important role in attracting the buyers. Proper packaging and handling of trout fish minimizes post harvest losses and improves shelf life of trout fish. For instance, clean cut, ready-to-cook or eat, trout fish will attract more consumers as compared to selling of raw whole trout fish. Swati trout fish is packed in plastic ice boxes for inter-district supply or transportation to fish outlets in Peshawar/Islamabad. The empty ice boxes are returned to concerned farmers for reuse, which costs time and additional money. This arrangement is good for transportation of limited quantity of fish; however, commercial scale fish marketing will require disposable packing materials made of Styrofoam/card board with proper branding. The majority of respondents (66%) interviewed preferred Styrofoam packing for trout fish while 34% viewed card board box with loose wrapped tout fish in plastic bag as their preferred choice for transportation of trout fish as per Figure-20.

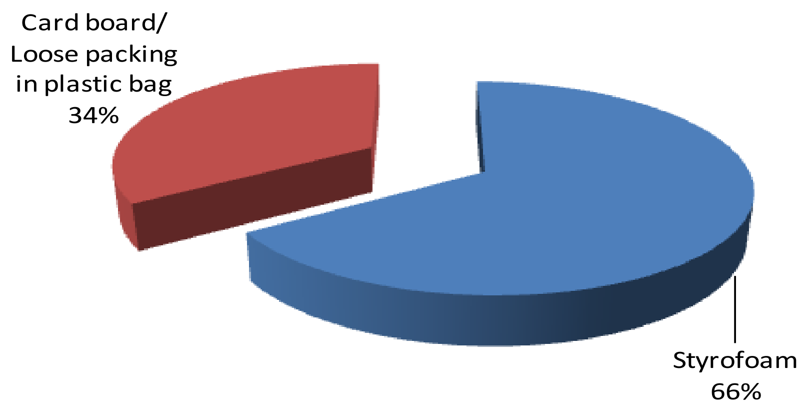


Figure 20: Preferred packing option for supply of fish

The following conclusion can be drawn from the above.

a) Most of the wholesalers in Karachi market and elsewhere do not properly handle their seafood products as these are placed outdoors without containers, ice blocks or ice flakes, which affects the quality and proper preservation of fish. The European Union (EU) banned imports of Pakistani seafood five years ago in April 2007. EU imposed banned on import of all types of seafood and its products from Pakistan because they failed to meet their requirements and standards.

b) The presence of poor quality fish products in market supports the conclusion that most of the local consumers are unable to recognize good quality fish and prefer to buy cheaper products. The fact that consumers do not express their dissatisfaction allows the producers to continue with prevailing poor practices vis a vis fish handling.

c) The labeling of fish and its value added products provides information to consumer on product composition, safety, traceability, date of harvesting/ processing and date of expiry etc. Unfortunately, proper branding/labeling of fish is not in place in domestic market except for imported fish only.

d) A variety of certification methods have been developed over past decade, all claiming that fish, they certify have been sustainably farmed and that they are the best option for consumers to purchase. But, these types of certifications and branding mechanisms are in place at very limited scale in fishery sector in Pakistan

2.12 Mode of Payment

The mode of payment to fish suppliers includes cash, on credit basis and in some cases a combination of both. More than half of the respondents in all the cities viewed to purchase fish on credit basis with payments made within 2-4 weeks to suppliers, whereas one-thirds of respondents viewed purchasing fish on cash payment. Most of the respondents in Karachi, Peshawar and Swat showed their willingness to buy fish on credit basis, while respondents from Lahore were ready to pay fish on cash payment. The city-wise analysis of mode of payments is given in Figure-21.

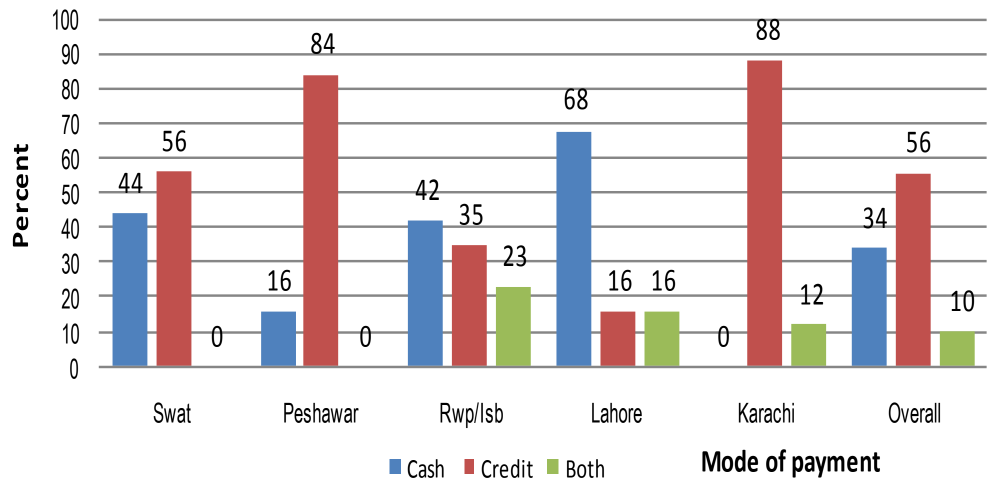


Figure 21: Mode of payment to Supplier

The city-wise responses of different markets segments are shown in Figure-22 below.

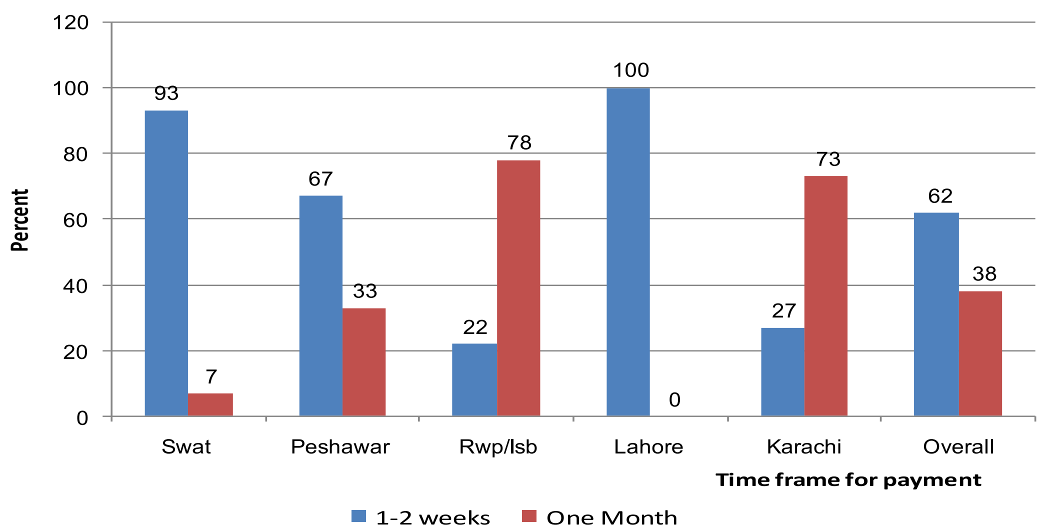


Figure 22: Time required for payment to Supplier

The duration for credit payment varies from one week to four weeks time while in rare cases it exceeds even 4 weeks duration. For instance, maximum duration for credit arrangement in Lahore was reported to be two weeks followed by Swat, where 93% of respondents reported to pay credit within 2 weeks.

2.13 Transportation from farm to Market

The cost of transportation is based on the market distance from farm, volume/ quantity of fish transported and its mode of transportation. The cost includes icing, packing, loading/unloading of containers and therefore varies from city to city. The average cost of transportation is highest (Rs.50 per kg) for fish transported from Karachi to Lahore by road through air conditioned containers loaded on a large trailer. The consignment is further supplied to other cities/ districts in Punjab and KPK. Similarly, the average cost of transportation from fish farms to market in Madyan/Bahrain and Mingora ranges from PKR. 5 to 11 per kilogram. The average cost of transportation from Swat to Islamabad/ Rawalpindi is PKR.29 per kilogram. The city-wise analysis of average transportation cost is given in the Figure-23 below.

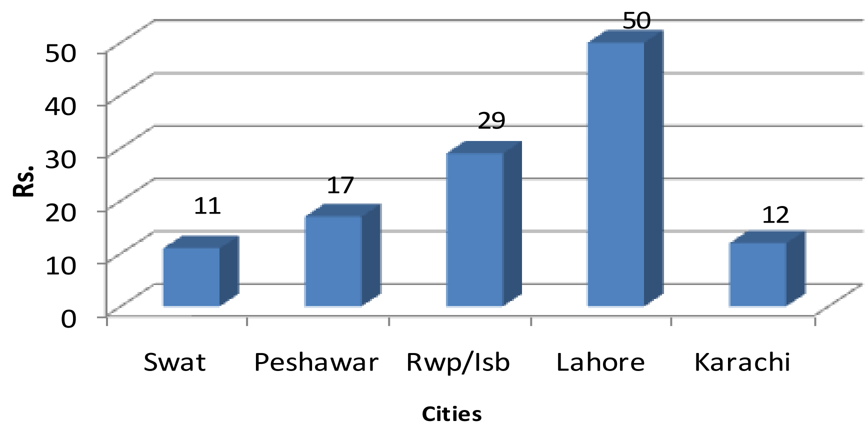


Figure 23: Average transport charges (Rs./KG)

The marketable fish is slightly cheaper on-farm as compared to the local market in Mingora-Swat and other cities as transportation cost is added to it. All the respondents from Karachi and Rawalpindi/Islamabad viewed that marketable fish should be provided to them at their business places without paying transportation cost. This understanding was endorsed by majority of the participants from Lahore and more than half of respondents from Peshawar and Swat as per details given in Figure-24 below.

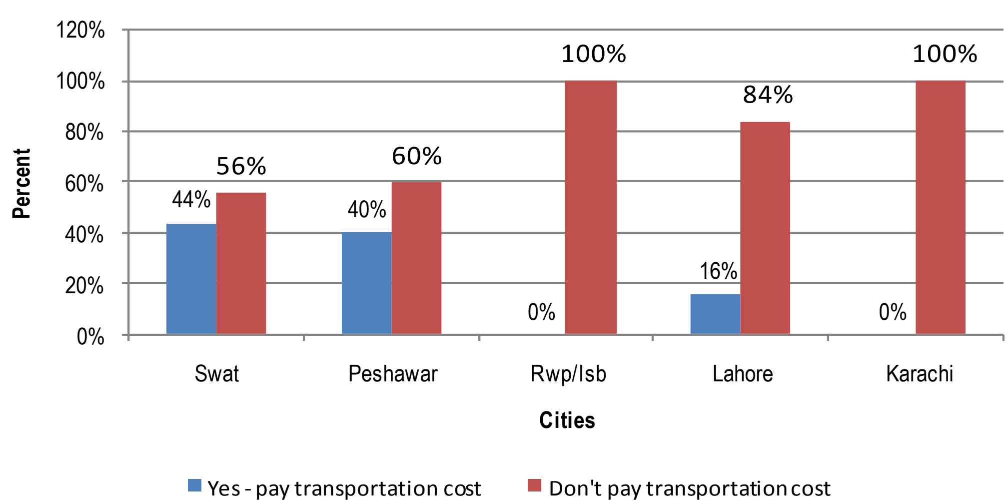


Figure 24: Payment of transportation cost

The following points were observed.

a) Fish hauling trucks are not available for transportation of a consignment of live fish from Swat to other areas,

b) Presently no cold chain exists for marketing of trout fish in any other city studied. Specific refrigeration equipment such as freezers is also needed at retail outlets for sale of trout fish.

c) The air cargo does not accept ice packed consignment for transportation to Karachi. However, use of dry ice is permitted by airlines but is not available in Swat. The producer of dry ice need to be identified and cost worked out for packing of consignment of trout fish.

2.14 Constraints in marketing of Trout Fish

The constraints in marketing of trout fish reported by the respondents consist of a) high price premium of trout fish as compared to other types of fish along with inadequate and inconsistent supply b) consumer taste for trout fish is not developed, c) high risk of transporting fish to Karachi and Lahore in absence of a proper cold chain system as reported by different market segments as per Figure-25.

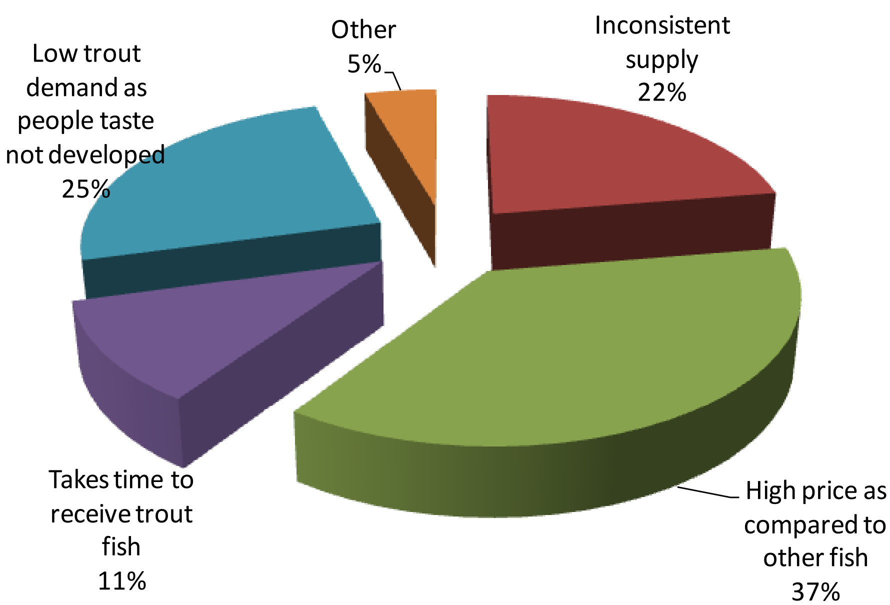


Figure 25: Constraints in receiving trout fish

In addition to above, the following constraints in production and marketing of fish were identified during the FGD meetings

- Production
  - Lack of knowledge on production programming;
  - Lack of availability of local quality of trout fish seed;
  - Lack of availability of local trout fish feed of acceptable quality;
  - Most fish farms are undercapitalized and affordable financing is not available
  - Environmental issues compliance
- Marketing
  - Lack of certification system for customers confidence

- Uninformative marketing system
- Marketing efforts of trout farmers are fragmented
- Trout farmers lack vertical and horizontal integration (within national and with processors/exporters)

Fish processing plants having hazard analysis critical control point (HACCP) certified have in general become more capital intensive. However, HACCP certification is required for marketing and export of trout fish to global market.

The local fish farmers were concerned with a regular supply of trout fish to their buyers in whole gutted ice packed chilled or frozen forms at reasonable prices. The stakeholders, who were involved in fish trade at Lahore informed that currently people have not developed taste for trout fish. This issue would remain the same unless sustained supply and competitive price is ensured.

2.15 Recommendations by respondents

Over two-thirds of respondents suggested lunching awareness and marketing promotion campaign with proper packaging to increase demand for trout fish in domestic market. Almost one-thirds of the respondents suggested increase in weight of marketable trout fish with increased production to ensure a consistent supply of trout fish at competitive rates around the year. For details, please refer to Figure-26 below.

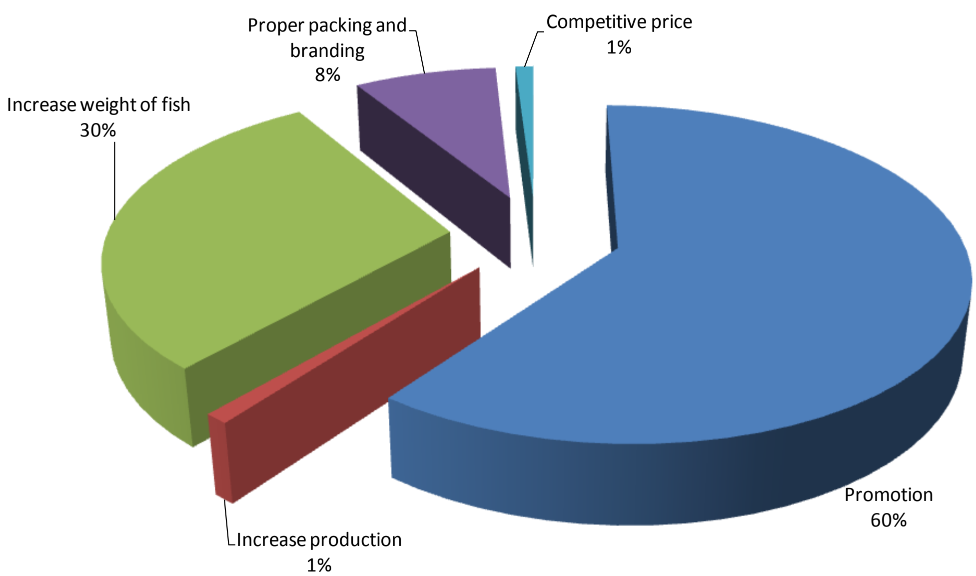


Figure 26: Increase sale of trout in the market

3. Recommendations

Swat's trout culture has always been closely linked to its tourism industry. Swat's hotels and restaurants purchased cultured rainbow trout from the district's farmers and served the fish to tourists and affluent residents. The business required very little post-harvest processing, as the fish were usually purchased on site or transported live from the grow out farms to onward sales points that served clusters of hotels in each of the main tourist areas. Discussions with farmers suggest that at its peak local market demand was around 60 Metric Tons. The cultivation of warm water fish, like carp, has also been done in the lower areas of Swat but it has never played an important role in Swat's economy or reached significant commercial levels. The commercial farming of cultivated fish has always been just a small and highly specialized component of the district's overall fishing-related industry.

According to a report by the provincial Fisheries Department, in 1994 there were 38 private farms cultivating rainbow trout in KPK Province and 23 were located in Swat.[24] Estimated total farmed production of rainbow trout in KPK in 1994 was 162 Metric Tons, with 60 Metric Tons (nearly 40%) coming from Swat's fisheries. Revenue in 1994 from the sale of market-sized fish in Swat was estimated to be about Rs. 24 million.[25] A business census of the private trout farms in Swat in early 2010 identified that by 2006, just before the escalation of extremist militancy, the annual farmed production of rainbow trout in Swat had dropped from 60 metric tons to an estimated 40 metric tons. By the end of 2007 production had nearly come to a complete stop. The situation was further jeopardized due to the 2007-09 Malakand conflict and subsequently July 2010 floods, which resulted, severe losses to infrastructure and completely loss of trout fish stock in Swat.

Rainbow trout was considered primarily as an interesting product for tourists as it was typically not affordable to the local population because of relatively high costs of production inputs. The drop-off in Swat's production of farmed trout reflects this important link between trout culture and tourism in Swat. While efforts have been made in the past to expand the demand for Swat's trout fish beyond local tourist market, none of these efforts ever were successful.

The aquaculture sector's inability to expand on a sustainable basis into larger markets has been a source of frustration to local authorities and the trout fish farmers. From a natural resource perspective, Swat and other adjoining districts like Upper Dir, Chitral and Shangla have tremendous potential to cultivate rainbow trout. The water quality in these regions, in terms of its quality, quantity and its temperature range, is ideal for trout cultivation. In addition, the rocky terrain provides fast moving water that can circulate quickly through the farm raceways and maintain naturally high levels of oxygen, a key for efficient trout cultivation.

The consultation with the stakeholders' articulates huge demand for trout fish in domestic market. However, the present production scale is limited and unable to meet the increasing demand for trout fish with existing infrastructure and resources available with the trout fish farmers. The production of trout fish is required to be shifted from existing subsistence level farming to commercial scale farming with competitive price premium to cope with increased demand for trout fish. This would however, require further investment in the aquaculture sector in Malakand division.

---

[24] *The 23 farms reflect 8 full systems (Combined Hatcheries and Grow out ponds) and 15 partial systems (Exclusively Grow Out Ponds)*

[25] *Production and Culture of Trout in the Northwest Frontier Province and Northern Areas of Pakistan. National Agriculture Resource Center, M. Yaqoob*

The future of this growing trout sector could be secured, if the stakeholders[26] in the supply chain play their role towards sustainability of the sector as a whole. One part of the industry cannot achieve this alone. As the Swat fisheries sector would adapt a new market realities, structural adjustment would take place in the mindset of the trout farmers for re-training and adoption of new paths of developmental activities to remain competitive in their businesses as well its price. In particular small scale producers of trout fish requires access to finance, capacity building and technology transfer to be able to meet the requirement of national and export markets. Trout farming in an immense untapped resource and any future investment in trout value chain will yield enormous benefits over the long run in terms of job creation, food security and poverty alleviation. A summary of recommendations for increased production and further development of the market are outlined below.

1. The study reveals that there is a huge gap between demand for and quantity of trout fish available in Swat. Firm Project has rehabilitated 18 private sector fish farms in Swat with current production capacity of 64 metric tons and potential to increase it to 100 metric tons as compared to demand of 2900 metric tons of trout fish for 5 cities studied.

2. The private sector trout fish farms in upper Dir, shangla and chitral districts of Malakand division are mostly dormant and have approached the provincial government of Khyber Pakhtunkhwa for rehabilitation of their fish farms on the pattern of support to Swat fishery sector. However, prior to extending support to these fish farms, site assessments and water quality tests at several alternative locations/districts in Malakand Division will be required for consideration of commercial-level expansion. The support to these private sector trout fish farms may include working capital and rehabilitation grants, in-kind support of construction materials for rehabilitation of aquaculture facilities coupled with provision of production inputs, operating equipment and technical assistance/ trainings to increase production of trout fish to commensurate with demand for trout fish.

3. The current level of technical, business and management skill that is in place at most of the farms is not sufficient to engineer production operations onto a path of sustainable growth. Taking trout breeding and production operations from artisan to commercial level is significantly more demanding. Since margins are lower, costs of inventory increases, and wholesale markets become much less flexible. Meeting the needs of these more demanding markets while remaining profitable requires higher levels of talent and experience among management and technical staff of trout fish.

4. Upon receiving USAID support, partner trout fish farms have rehabilitated their raceways and made operational their businesses. The fish farmers reported an unprecedented fish growth as their fish stock reached marketable size in ten months against standard time of twenty months by using imported seed and fish feed. Continued availability of pre-formulated trout fish feed is one of the major impediments for increased production at farm level. The establishment/up-gradation of a fish feed manufacturing unit in public or private sector under the supervision of fish nutritionists will help support in expansion of the sector and fish production on sustainable basis. Some of the private sector organizations have already shown their interest to assess the potential for establishment of a fish feed unit and may support the creation of a fish feed unit, which will address this issue.

5. The availability of certified trout fish seed at the local level is another challenge faced by Swati trout farmers. Following Firms project precedent, four trout fish farmers have imported 550,000 trout eyed eggs, from USA. The commercial scale production of trout fish

[26] *Producers, transporters, processors and retailers, and Government institutions*

would require financial and technical support under qualified geneticists to carry out fish breeding program for regular availability of seed to fish farmers at local level.

6. Low production of trout fish means few export opportunities, the current requirement of fish for export purposes is a minimum 28 metric tons of frozen fish, where production at the present stage is too small and minor to meet these demands. Production needs to be enhanced and improved to achieve a sustainable level of production and supply.
7. Post-harvest challenges in aquaculture sector include lack of proper fish handling and processing. Trout fish is raised in cold water and is a highly perishable commodity; it requires handling with care and chilled in appropriate temperatures. As equipment for chilling is not available, trout is usually placed directly on crushed ice, causing injury to its exterior and failing to maintain freshness and quality in fluctuating temperatures. Similarly, no processing or value added activities are attributed to trout fish. The processing units are not available in Swat and the production is too low to provide adequate quantity for processing and value additions purposes. Processing units established on the basis of existing production level will face a lack of supply because of an undeveloped aquaculture sector.
8. The sustainable growth in Swat's trout industry will only occur when it finds a way to consistently and profitably supply rainbow trout to the major cities in Pakistan. Developing these linkages requires, at a minimum, new investments in the production and harvesting capacity and skills of the farmers, enhanced farm-level access, cold chain systems that connects the farms with chain stores and other large wholesale buyers, and marketing to help identify the end consumers and their preferences.
9. At the end of value chain, flow of market information between local, national and global markets is low and trout farmers are unaware of price structures of fish in these areas. There is also lack of formal links exist between trout producers and high value markets. The study has developed a database of fish market in various cities with those willing to purchase and sale trout fish, which would help establish their linkages with these traders. The market linkages both for trout fish businesses with trout sellers and consumers should be developed through design of awareness campaign, promotional materials like leaflets, website on trout fish. This will help disseminate information about the availability, taste, price and nutritional value of trout fish. Similarly, promotional banners and standees should be installed at super markets, wholesale fish dealers, hotels/restaurants, fish eating points etc.
10. Cold chain facilities such as freezers, flake ice machine or block ice brakeage machine, cold storage, chilling or blast freezing tunnel plants, freezer mounted vehicles for transportation of fish are essential in preserving the quality of fish from the point of culture to serving consumer. These facilities are not available in Swat and thus causing a major challenge to link Trout fish farms with the wider market. The following highlights suggested action for development of a cold chain at farm or cluster level.
    a. Micro degutting unit is required for post harvest degutting of fish. This unit includes
        i. Sinks with chilled water for washing of degutted fish
        ii. Flake ice machine for packing of processed fish
        iii. Packaging of fish in insulated boxes
    b. Temperature control transport vehicle is required for safe transportation of fish from processing set up to market wholesaler/retailer chain

c. Awareness regarding hazard analysis critical control points (HACCP) and codex Alimentarius is a prerequisite for protection of workers from bacterial growth during fish handling, processing and transportation.

d. Support private sector to invest in development of a cold chain from trout farms to the market consisting of infrastructure such as:

    i. Small cold store,

    ii. Blast freezing tunnel or fish chiller,

    iii. Walk in freezer mounted on vehicles; and,

    iv. Other related equipment for the farmers, so that the trout fish product quality and freshness is not affected.

11. For export and high value markets, certification of trout farms under (HACCP) is necessary. It will also keep our trout fish farms' environment clean and avoid spreading diseases around fish farms.

12. The legislation and rules regulating trout aquaculture production and processing needs revision. The final product is of questionable quality, since it will be lacking in proper quality inspection and certification, which in turn affects competition for trout fish in global markets. The public sector has to play its due role in implementing regulations and setting standards in a number of areas associated with trout fish farming and its processing to minimize potential hazards mainly environment related external factors. These factors include use of space, governance of the industry, food safety, animal health and research in appropriate areas as per requirement of the private sector. The implementation of these regulations will depend on technically trained staff and financial resources provided to strictly enforce these management protocols in handling of fish and its transportation for consumers.

13. In cases where the public sector is still expected to perform roles that it cannot effectively fulfill, the industry should explore opportunities to develop public/ private partnerships that can better address the gaps and shortcomings. These includes establishment of Diagnostic lab for disease diagnoses, fish quality certifications, research and development initiatives and creating enabling environment for aquaculture sector.

14. Unlike other types of fish, the wholesale rate of trout fish is on a high side. The Swati trout fish farmers were adamant to reduce price premium per kilogram. However, they need to understand the requirement of market and to offer trout fish and its value products at competitive prices to achieve commercial scale production, increase their sale revenues and create customer loyalty for the product in the long run. The trout famers need further technical assistance support to help them develop marketing plans for sale of their produce.

15. There is a need to develop a marketing campaign to educate fish farmers’ community on proper fish handling and hygiene techniques so that demand for quality fish can increase. Recognition of fish quality will compel fish farmers to adopt better fish handling practices.

16. A brand name for Swati Trout fish should be registered with concerned authority so as recognize the products while selling it in national markets. Moreover, the trout fish products need to be properly labeled with the following information: commercial name of species, production method (wild or farmed) and the area where the fish was farmed.

17. The study recommends the following to address some of the gaps identified in trout production, processing and handling techniques:-

- Strengthen the capacity of various public and private sector departments through on-going technical and management training programs in best management practices, upgraded equipment and laboratories and market linkages development.
- Development of marketing linkages in high value market cities of Lahore, Islamabad, Karachi, Peshawar and other cities, where there are opportunities for the product to fetch a higher profit for local fish farmers. Firms Project will share the database of the buyers in national market to help them establish their linkages with them for sale of their produce.
- Continuous market price surveillance and flow of information from the market to the farmers.

4. Annexure

Annex -1 List of Documents Reviewed

i. 2006 National Policy on Fisheries and Aquaculture developed with FAO support.

ii. Swat Aquaculture: Sector Recovery and Development Strategy, USAID Firms Project – January 2011.

iii. Business Census of Swat Fishery Sector by USAID FIRMS Project, March 2010.

iv. Business Recovery Plans of Trout Fish Farms prepared with USAID Support, Dec 2010.

v. Firms Project Grants framework for Malakand recovery program and Technical Assistance plan for fisheries, August 2010.

vi. Production and Culture of Trout in the Northwest Frontier Province and Northern Areas of Pakistan. National Agriculture Research Center, M. Yaqoob.

vii. Credit policy of State Bank of Pakistan for fishery sector.

viii. Firms Project fisheries census reports, business recovery plans, brief on fishery sector, physical and financial progress reports of fish farms.

ix. Progress Reports of Fishery Sector.

Annex -2 Research Tools

Appendix -1 to Annex-2: Questionnaire

Questionnaire Number (For official use only)					

Questionnaire

Introduction:

Good Day/Morning/Afternoon! My name is ______________________________. I/We come on behalf of the USAIDFIRMS Project, Islamabad. We are carrying out a study on market demand for trout fish in local market in Swat and domestic market in provincial capitals (Lahore, Karachi and Peshawar) and Islamabad/Rawalpindi from trout fish farmers, whole sellers, market sellers, large hotels and restaurants, etc.with the objective to assess the current production and market demand for trout fish.

You, being a stakeholder, were chosen for this interview by chance and your cooperation is voluntary. You may choose not to answer the question/s that follow or stop the interview at any time you like.

All the answers are confidential. Your participation and the information you share with us won't affect your relationship with your community or FIRM 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.

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

We are very grateful for your sincere answers.

Would you like to participate in this survey?

Respondent Agrees To Be Interviewed--01

Respondent Does Not Agree To Be Interviewed--------------------------------02

Start the Interview: **(See your watch and enter)**

End the Interview: **(See your watch and enter)**

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.

ID	Question	Response	SKIP
ID1	Interview date: (dd/mm/yy)		

ID	Question	Response	SKIP
ID2	Result of Interview: *(to be completed at end)*	Completed.. 1 Refused.. 2 Partly completed .... 3 Other (specify) 4	
ID3	Name of the Enumerator:		

ID4	**Checked by:** Name of Supervisor Date (ddmmyy)	______________________	

ID5	**Checked by:** Name of the Data Entry Manager *(check questionnaire for completeness and assign sequential ID on top of this page data entry)*	______________________	
ID	**Question**	**Response**	**SKIP**
	A. Personal Information		
ID1	Please mention type of market, for which demand for trout fish is being assessed.	Local (Swat) .... 1 Domestic .... 2 Other (Specify)	
ID2	Mention city, where the trout market segment is located.	Swat .... 1 Peshawar .... 2 Rawalpindi .... 3 Islamabad .... 4 Lahore .... 5 Karachi 6	
ID3	Name of major hotel/restaurant/whole seller/market, dealing in sale/purchase of fish	______________________ _______	
ID4	Name of respondent	______________________ _______	
ID5	Status of respondent	Owner.. 1 Manager 2	

ID	Question	Response	SKIP
		Incharge .... 3 Purchase Manager........ 5 Purchase Supervisor........ 6 Sales person .... 7 Other (specify)	
ID6	Mailing address	________________________________	
ID7	PTCL contact	________________________________	
ID8	Cell #	________________________________	
ID9	Email address:	________________________________	
ID10	Address of business (if different from mailing address):	________________________________	
ID11	GPS coordinates	N= ________________________________ E=________________________________	
	B. Trout Fish Market Demand Information		
ID1	Currently what kind of fish are you providing to customers?	Marine .... 1 Fresh water .... 2 Trout .... 3 Imported........ 4 Other (Specify)........	
ID2	Which seasons of the year experience high fish sales?	Winter........ 1 Summer .... 2 Spring........ 3 Autumn........ 4	
ID3	Any reason, for low sale of fish in the season specified in the above question?	________________________________	
ID4	Please Let us know, what is rate of	_________fish ...._________ per kg	

ID	Question	Response	SKIP
	other types of fishes,than Trout, you are selling already? (Rs. per kg)	_________fish .... _________ per kg _________fish .... _________ per kg	
ID5	Where do you currently receive your demanded quantity of fish?	At business place .... 1 At Fish Farm .... 2 Market (Superstore/Retailers etc) .... 3 Other (Specify)	
ID6	How much you currently sell (average) on daily basis?	__________________________Kg	
ID7	In which season you start selling and till when you stop selling?	Start________________ ; Stop__________________ 1=Winter; 2= Summer; 3=Spring; 4=Autumn; 5=Whole year	
ID8	Do you sell raw (uncooked) fish also?	Yes .... 1 No... 2	
ID9	How much you currently pay for transportation charges per kg from farm to different cities?	Swat .... 1 Peshawar .... 2 Rawalpindi .... 3 Islamabad .... 4 Lahore .... 5 Karachi .... 6 Not applicable .... 99 Others (Specify)	
ID10	What would be your current estimated target to buy trout fish per month?	______________________________________ ________	
ID11	How much Trout fish do you think you would require round the year (kg/month). Provide quarterly break-up of quantity of marketable fish required	Q1: Jan-March Q2: Apr-June Q3: July-Sep Q4: Oct.-Dec Total	
ID12	Please Let us know, what is rate of trout fish you are selling already in different seasons? (Rs. per kg)	Winter: Rs. ___________________ Summer : Rs. ___________________ Spring: Rs. ___________________ Autumn: Rs. ___________________	

ID	Question	Response	SKIP
		Not applicable 99	
ID13	At what rate are you currently ready to buy Trout fish (Rs/kg)	Up to 600 per kg .... 1 Rs. 601 to Rs. 900 per kg .... 2 Rs. 901 to Rs. 1200 per kg .... 3 Rs. 1201 to Rs. 1500 per kg .... 4 More than Rs. 1500 per kg .... 5 Not applicable 99	
ID14	Who are the buyers of trout fish?	Tourists .... 1 Local population.. 2 Not applicable .... 99 Other (Specify)...	
ID15	What is the mode of transportation of trout fish currently?	By personal transport................................. 1 By public transport .... 2 By Courier services.................................... 3 By Air.. 4 Not applicable .... 99 Others (Specify)	
ID16	What would be your priority of buying Trout fish?	Live.. 1 Whole chilled ice packed .... 2 Frozen ice packed...................................... 3 Whole gutted ice packed............................. 4 Fillet... 5 Not applicable .... 99 Other (Specify)...	
ID17	What is your preferred packing option for supply of marketable trout fish?	Styrofoam.. 1 Loose packing in plastic bag....................... 2 Card board Carton .... 3 Paper carton .... 4 Not applicable .... 99 Other (Specify)...	
ID18	What will be the mode of payment to the supplier?	Cash.. 1 Credit .... 2 Not applicable 99	1⟶ID20
ID19	If credit, what would be the time frame for payment?	One Week .... 1 Two Weeks 2	

ID	Question	Response	SKIP
		One Month ..... 3 More than one month ..... 4 Not applicable ..... 99 Other (Specify)	
ID20	Do you have self-transportation services?	Yes ..... 1 No ..... 2 Other (Specify)	
ID21	Are you ready to pay for the transportation cost from Swat?	Yes ..... 1 No ..... 2 Not applicable ..... 99 Other (Specify)	
ID22	Are you currently buying trout fish from Swat Trout fish farmers?	Yes ..... 1 No ..... 2 Other (Specify)	2→ID26
ID23	If yes, please specify; Name of fish farm:		
ID24	Contact no:		
ID25	Address of farm:		
ID26	What are your current constraints in receiving trout fish?	Inconsistent supply ..... 1 High rate as compared to other fish ..... 2 Takes time to receive trout fish ..... 3 Low trout demand as People taste not developed ..... 4 Not applicable ..... 99 Other (Specify) 5	
ID27	What are your recommendations /suggestions to increase the sale of trout in the Market	____________________ ________	

Appendix-2 to Annex-2: Outline of Focus Group Discussion (FGD) meeting with Trout Fish Farm Owners

Persons attended___________________________________Date:________________

USAID Firms Project is carrying out a study on market demand for trout fish in local market in Swat and domestic market in provincial capitals (Lahore, Karachi and Peshawar) and Islamabad/Rawalpindi from trout fish farmers, whole sellers, market sellers, large hotels and restaurants, etc. with the objective to assess the current production and market demand for trout fish. The purpose of the FGD is to obtain perspectives of Swati trout farmers on trout production and marketing related aspects. We are very grateful for your participation in the FGD meeting.

I. **What is the overall status of construction/rehabilitation of fish farms (raceways, water supply system, guard room/store etc.)? Identify number of farms falling under each of the following categories?**

i. Fully Completed (100% completed)_______________________________
ii. Near completion (80% and above)_________________________________
iii. Partially completed (50% to 79%) ________________________________
iv. Moderately completed (30% to 49%)______________________________
v. Work in progress but comparatively slow (<30% progress)_____________
vi. What issues/ constraints were faced by the farmers in construction rehabilitation?

II. **How many farms are operational with fish stock or ready to receive fish stock?**

i. Fully Operational with fish stock _________________________________
ii. Partially Operational with fish stock ______________________________
iii. Operational and ready to receive fish stock_________________________
iv. Construction works not completed ________________________________
v. Others (specify)____

III. **What is current capacity of 18 fish farms to hold marketable fish stock?)**

i. (1-5mt), (5-25 mt), (25-50 mt) (50-75 mt), (75-100mt).
ii. And 6 hatcheries to hatch per cycle? ______________________________
iii. How much quantity of marketable fish will be ready by December 2011 and March 2012?
iv. How the production can be increased? _____________________________

v. At the end,? What processing and storage facilities are available at the farm level?____

IV. **What is your current marketing strategy for sale of marketable trout fish farm?**

i. Are you selling it on retail basis at your farm, ______________________

ii. supplying it or would like to supply it to market (major hotels and restaurants, fish markets, dealers) at local level in Swat ______________

iii. or to domestic market in large cities in Pakistan? ___________________

iv. What was average selling rate per Kg? How much quantity did you sell out during the last 3 months? _______________________________________

v. What is the market demand for trout fish in the local and domestic market?

vi. How it can be increased?____

V. **How did you find results of USAID provided imported seed and pre-formulated feed as compare to local seed and feed?**

i. Give your views in terms of fish growth, ______________________________

ii. Price comparison and availability as well. _____________________________

iii. Did you use USAID provided operating equipment for hatching, grow out, harvesting, and packaging of fish? ______________________________________

iv. How was your experience? ____

v. Did you replicate the model by importing production inputs? _______________

vi. How was your experience?____

VI. **A number of fishery related trainings and follow-up technical assistance support has been provided by USAID Firms during last one year?**

i. How useful was the training and other TA support in rehabilitation and making operational your firms?____

ii. Do you think the farmers are trained enough to work independently, without any technical support? If not, how would you obtain similar support in future?

iii. What technical support do you think is necessary to improve your production of trout farming?____

VII. **What water treatment systems are you using to neutralize waste generated from your farms?**

i. Do you plan to construct water treatment system for neutralization of waste water?

ii. If not, mention reasons for not doing so? ___________________________

iii. Are you aware of environmental law applicable to water pollution disposal? ____

iv. How do you dispose the trout fish waste?_______________________

VIII. **How do you move fry/fingerlings from one farm to other?**

i. What transport vehicles or facilities are available for the purpose?____________

ii. How do you transport marketable fish? _________________________________

iii. What is cost of transportation per kilogram? ___________________________

iv. Is the transport services efficient and effective, If not, how can it be improved?____

IX. **Did you get credit for establishment and running of trout fish farm,**

i. If yes, what was your source of credit, terms and conditions and rate of mark-up you paid or will to have to pay on credit? _____________________________

ii. If no, are you aware of the state bank of Pakistan policy for credit?__________

iii. Would you like to receive credit facility, if offered by financial institution and to what extent?____

X. **How did you find USAID support (grant, production inputs, operating equipment and technical assistance) in rehabilitation and making fish farms operational, improving production and marketing of trout fish?** __________________________

How would you rank it? (Excellent, Good, Satisfactory or poor)?________________

What are your suggestions for improvement of the Firms fishery sector recovery model?

Appendix -3 to Annex-2: Outline of Focus Group Discussion (FGD) with Key Stakeholders in Target Cities

USAID Firms Project is carrying out a study on market demand for trout fish in local market in the provincial capitals (Lahore, Karachi and Peshawar) and Islamabad/Rawalpindi from the fish suppliers like whole sellers, market sellers, large hotels and restaurants, etc. with the objective to assess the market demand for trout fish. The purpose of the FGD is to obtain perspectives of stakeholders at the City level on trout consumption, demand and marketing related aspects. We are very grateful for your participation in the FGD meeting.

Name of city __________ Location of meeting _________Altitude N: __________E:______

1. What do you think; how much trout fish (kg) is currently consumed per annum in your City? Please provide quarterly break-up of marketable fish currently consumed. Also, please indicate potential target (Kgs) for marketable trout fish?

Sr. No.	Quarters	Current sale (kgs)	Potential for trout Fish (kgs)	Remarks if any
1	Jan-March			
2	Apr-June			
3	July-Sep			
4	Oct.-Dec			
	Total			

2. Swati farmers are demanding Rs.1000 per kg at farm gate for sale of trout fish? Do you think, trout fish consumers in your City would be able to pay this price for purchase of trout fish? Or what would be the reasonable price for people to buy trout fish?
   a) Up to 600 per kg
   b) Rs. 601 to Rs. 900 per kg
   c) Rs. 901 to Rs. 1200 per kg
3. Please indicate what kind of fish are you providing to customers, apart from trout fish? Please indicate a comparison in terms of availability, consistency in demand and price with other types of fish?

Kind of Fish	Name if required	Availability (%)	Consistency in demand (Yes, No)	Price (Varied in a year) (%)
Marine:				
Fresh water				
Trout:				
Imported				

Other (Specify):				

4. Do you think, people are familiar with taste of the trout fish? If not, how can their taste of trout fish be developed?
   i. Awareness raising campaign through marketing print and electronic media
   ii. Awareness raising campaign through words of mouth
   iii. Awareness raising campaign by arranging promotion events to taste trout
   iv. Others
5. Which seasons of the year experience high fish sales? Any reason, for low sale of marketable fish? (pl. circle the season)

   Winter Summer Autumn Spring

6. Please, Let us know, how much is the cost per Kg for other types of fishes you are already selling?(Rs. per kg), which can be compared with trout fish in taste?
   1. Name of fish ______________sold @ Rs. ____________/kg
   2. Name of fish ______________sold @ Rs. ____________/kg
   3. Name of fish ______________sold @ Rs. ____________/kg
   4. Name of fish ______________sold @ Rs. ____________/kg
   5. Name of fish ______________sold @ Rs. ____________/kg

7. What are major market segment, where you experienced higher demand for fish?
   i. Individual customers
   ii. Guests/Tourists
   iii. Retailers
8. What is the mode of transportation of fish currently?
   i. By personal transport
   ii. By public transport
   iii. By Courier services
   iv. By Air
   v. Others (Specify)
9. How much do you currently pay in terms of transportation charges per kg from different cities?
   i. From________________to_________________Price per kg Rs.______________
   ii. From________________to_________________Price per kg Rs.______________
   iii. From________________to_________________Price per kg Rs.______________
   iv. From________________to_________________Price per kg Rs.______________

10. Who you think, what would be the best marketing strategy for selling of Trout fish?
    i. Live
    ii. Whole chilled ice packed
    iii. Frozen ice packed
    iv. Whole gutted ice packed
    v. Fillet
    vi. Other (Specify)
11. What is your preferred packing option for supply of marketable trout fish?
    i. Styrofoam
    ii. Loose packing in plastic bag
    iii. Card board Carton
    iv. Paper carton
    v. Other (Specify)?
12. What will be the mode of payment to the supplier? Cash: _________Credit: ___________
13. If credit, what would be the time frame for payment?
    i. One Week:
    ii. Two Weeks:
    iii. One Month:
    iv. More than one month:
    v. Other (Specify):
14. What are your recommendations /suggestions to increase the sale of trout in the market?

Name of respondent	Organization Name	Cell #	PTCL #	E-mail address	Mailing address

Annex -3 City-wise Respondents

Appendix -1 to Annex-3: Outline of Focus Group Discussion (FGD) with Key Stakeholders in Target Cities

Sr. No.	Type of market	No. visited in all target cities
1	Large Hotels	41
2	Super Stores	19
3	Restaurants	12
4	Fish markets/Whole sellers	28
5	Fish eating pints	19
	Total	126

Appendix -2 to Annex-3: Status of Respondents Interviewed

	Swat		Peshawar		Rwp/Isb		Lahore		Karachi		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Owner	13	52	18	72	6	23.08	11	44	8	32	56	44.44
Manager	6	24	7	28	3	11.54	9	36	12	48	37	29.37
Incharge	5	20			1	3.85	1	4			7	5.56
Purchase Supervisor					11	42.31	3	12	5	20	19	15.08
Sales Person					1	3.85					1	.79
Other	1	4			4	15.38	1	4			6	4.76
Total	25	100	25	100	26	100	25	100	25	100	126	100

Appendix -3 to Annex-3: City-wise Respondents

Particulars	Category
Swat	
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	4
[redacted]	4
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1

Particulars	Category
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	5
[redacted]	5
[redacted]	
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1

Particulars	Category
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	3
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	3
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4

Particulars	Category
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	4
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	5
[redacted]	
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	1
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2
[redacted]	2

Particulars	Category
[redacted]	3
[redacted]	4
[redacted]	4
[redacted]	4

Appendix -4 to Annex-3: Stakeholders/Respondents Interviewed

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]									
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	3439931	7220752
[redacted]	1	[redacted]	Owner	[redacted]	[redacted]	[redacted]	[redacted]	3447377	7220884
[redacted]	1	[redacted]	Incharge	[redacted]		[redacted]		3447639	7223861
[redacted]	1	[redacted]	Incharge	[redacted]		[redacted]		3441552	7214664
[redacted]	1	[redacted]	Owner	[redacted]		[redacted]		3441651	7214820
[redacted]	1	[redacted]	Owner	[redacted]		[redacted]		3441790	7215021
[redacted]	1	[redacted]	Incharge	[redacted]		[redacted]		3439705	7208376
[redacted]	1	[redacted]	Owner	[redacted]		[redacted]		3439706	7208315
[redacted]	1	[redacted]	Incharge	[redacted]		[redacted]		3438705	7208279
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]		3446142	7221584
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]		3446142	7221584
[redacted]	1	[redacted]	Manager	[redacted]		[redacted]		3445216	7221444
[redacted]	1	[redacted]	Owner	[redacted]	[redacted]	[redacted]		3446026	7221503
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	3446306	7221443
[redacted]	4	[redacted]	Incharg	[redacted]	[redacted]	[redacted]		344634	722189

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]			e	[redacted]	[redacted]	[redacted]		1	7
[redacted]	4	[redacted]	Owner	[redacted]	[redacted]	[redacted]		3446341	7221695
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3447639	7223861
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3441030	7213704
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3447408	7221185
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3446332	7221650
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3447403	7221036
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3447400	7221065
[redacted]	5	[redacted]	Manager	[redacted]		[redacted]		3447401	7221126
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3447406	7221053
[redacted]	5	[redacted]	Other	[redacted]		[redacted]		3446339	7221682
[redacted]									
[redacted]	1	[redacted]	Manager			[redacted]		3358425	7128562
[redacted]	1	[redacted]	Manager		[redacted]	[redacted]		3358862	7127116
[redacted]	1	[redacted]	Manager		[redacted]	[redacted]		3400426	7130548
[redacted]	1	[redacted]	Manager		[redacted]	[redacted]	[redacted]	3400903	7133815
[redacted]	1	[redacted]	Owner		[redacted]	[redacted]		3400880	7134390
[redacted]	2	[redacted]	Manage	[redacted]	[redacted]	[redacted]		335944	712954

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
			r	[redacted]	[redacted]	[redacted]		0	9
[redacted]	2	[redacted]	Owner			[redacted]		3358492	7128298
[redacted]	2	[redacted]	Owner		[redacted]	[redacted]		3357775	7125910
[redacted]	2	[redacted]	Owner		[redacted]	[redacted]		3358874	7127130
[redacted]	3	[redacted]	Owner		[redacted]	[redacted]		3353461	7128477
[redacted]	3	[redacted]	Owner	[redacted]		[redacted]		3358480	7128404
[redacted]	3	[redacted]	Owner	[redacted]		[redacted]		3358487	7128354
[redacted]	3	[redacted]	Manager		[redacted]	[redacted]		3400431	7130598
[redacted]	3	[redacted]	Manager		[redacted]	[redacted]	[redacted]	3400409	7130568
[redacted]	3	[redacted]	Owner		[redacted]	[redacted]		3400409	7130568
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3359668	7132565
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3359796	7132459
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3059742	7132498
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3359797	7132456
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3359752	7132487
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3400587	7134550
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3400582	7134549

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
						[redacted]			
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3400577	7134543
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3358468	7128007
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3358410	7127504
[redacted]									
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	3335283	7303645
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]	[redacted]	3335528	7303253
[redacted]	1	[redacted]	Sales Person	[redacted]	[redacted]	[redacted]		3341352	7301216
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]		[redacted]		3335511	7303195
[redacted]	1	[redacted]	Incharge	[redacted]	[redacted]	[redacted]		3343259	7304675
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]		[redacted]	3336332	7303891
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]		3341435	7306589
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]		3342937	7305031
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	3343246	7304748
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]	[redacted]	3340438	7300481
[redacted]	1	[redacted]	Purchase Supervi		[redacted]	[redacted]		3342596	7303413

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
			sor			[redacted]			
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]		[redacted]		3342890	7305996
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]		[redacted]		3341352	7301216
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]		[redacted]		3341352	7301216
[redacted]	2	[redacted]	Purchase Supervisor		[redacted]	[redacted]	[redacted]	3335862	7301416
[redacted]	2	[redacted]	Owner	[redacted]	[redacted]	[redacted]		3343001	7305029
[redacted]	3	[redacted]	Manager	[redacted]	[redacted]	[redacted]		3343532	7305185
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3336876	7303108
[redacted]	4	[redacted]	Other	[redacted]	[redacted]	[redacted]		3336881	7303101
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3336866	7303105
[redacted]	4	[redacted]	Other	[redacted]				3341270	7307619
[redacted]	4	[redacted]	Owner		[redacted]	[redacted]		3344131	7304714
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3341436	7306582
[redacted]	5	[redacted]	Other	[redacted]		[redacted]		3305830	7303612

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]	5	[redacted]	Other	[redacted]		[redacted]		3342604	7303418
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3343001	7305029
[redacted]	1		Manager		[redacted]	[redacted]	[redacted]	135233	7418755
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]		105224	7418672
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	3133687	7420248
[redacted]	1		Manager	[redacted]	[redacted]	[redacted]	[redacted]	3134203	7420113
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]		[redacted]		3128081	741449
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]		[redacted]		128270	7419171
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]	[redacted]	128266	7419171
[redacted]	3	[redacted]	Manager	[redacted]	[redacted]	[redacted]		130664	7419802
[redacted]	3	[redacted]	Manager	[redacted]		[redacted]		105225	7418670
[redacted]	3	[redacted]	Owner		[redacted]	[redacted]		100675	7420244
[redacted]	3	[redacted]	Manager	[redacted]	[redacted]	[redacted]		102050	7421869

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		2450564	6711405
[redacted]	4	[redacted]	Owner	[redacted]	[redacted]	[redacted]		2450564	6711408
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3134620	7418552
[redacted]	4	[redacted]	Other	[redacted]		[redacted]		3134584	7418738
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		109795	7420770
[redacted]	4	[redacted]	Manager		[redacted]	[redacted]		102900	7418871
[redacted]	4	[redacted]	Incharge	[redacted]		[redacted]		102933	7418871
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		3134636	7480086
[redacted]	4	[redacted]	Manager	[redacted]		[redacted]		3134337	7419155
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		134337	7419155

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]	5	[redacted]	Owner	[redacted]	[redacted]	[redacted]		2833782	7017102
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		3134935	7419641
[redacted]	5	[redacted]	Owner	[redacted]		[redacted]		100786	7420805
[redacted]	5	[redacted]	Owner	[redacted]	[redacted]	[redacted]		100786	7420805
[redacted]									
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2453938	6707006
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2452317	6705429
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2446705	6703269
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]		2454261	6704653
[redacted]	1	[redacted]	Manager		[redacted]	[redacted]	[redacted]	2454312	6704694
[redacted]	1	[redacted]	Owner	[redacted]		[redacted]		2451015	6659676

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
						[redacted]			
[redacted]	1	[redacted]	Owner	[redacted]	[redacted]	[redacted]		2454202	6704569
[redacted]	1	[redacted]	Manager	[redacted]	[redacted]	[redacted]		2446762	6703246
[redacted]	1	[redacted]	Manager		[redacted]	[redacted]	[redacted]	2451612	6703758
[redacted]	1	[redacted]	Purchase Supervisor		[redacted]	[redacted]	[redacted]	2451322	6702413
[redacted]	1	[redacted]	Purchase Supervisor		[redacted]	[redacted]	[redacted]	2450777	6701534
[redacted]	1	[redacted]	Purchase Supervisor		[redacted]	[redacted]		2450876	6701550
[redacted]	1	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]	[redacted]	2451130	6702051
[redacted]	2	[redacted]	Owner		[redacted]	[redacted]	[redacted]	2452247	6705393
[redacted]	2	[redacted]	Manager	[redacted]	[redacted]	[redacted]		2448846	6701666
[redacted]	2	[redacted]	Owner	[redacted]		[redacted]		2450950	6659733

Name of Business	Category	Name	Status	Cell #	PTCL #	Address	Email	Altitude	
								N	E
[redacted]	2	[redacted]	Owner		[redacted]	[redacted]		2451054	6658774
[redacted]	2	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2451158	6658924
[redacted]	2	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2451206	6703119
[redacted]	2	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2453209	6709176
[redacted]	2	[redacted]	Purchase Supervisor	[redacted]	[redacted]	[redacted]	[redacted]	2455309	6706324
[redacted]	3	[redacted]	Manager	[redacted]	[redacted]	[redacted]	[redacted]	2452286	6705452
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]	[redacted]	2451017	6659677
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		2451865	6702064
[redacted]	4	[redacted]	Owner	[redacted]		[redacted]		2451000	6659676

Appendix -5 to Annex-3: List of Other Stakeholders

Sr. #	Name	Name of Business	Contact #	Mailing address	Email address
1.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3.	[redacted]	[redacted]	[redacted]	[redacted]	
4.		[redacted]	[redacted]	[redacted]	
5.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
7.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
9.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10.	[redacted]	[redacted]	[redacted]	[redacted]	
11.		[redacted]	[redacted]	[redacted]	[redacted]
12.		[redacted]	[redacted]	[redacted]	
13.	[redacted]	[redacted]	[redacted]	[redacted]	
14.		[redacted]	[redacted]	[redacted]	

Sr. #	Name	Name of Business	Contact #	Mailing address	Email address
			[redacted]	[redacted]	
15.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
16.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
17.	[redacted]	[redacted]	[redacted]	[redacted]	
18.	[redacted]	[redacted]	[redacted]	[redacted]	
19.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
21.	[redacted]	[redacted]	[redacted]	[redacted]	
22.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
23.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
24.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
25.		[redacted]	[redacted]	[redacted]	[redacted]
26.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
27.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Appendix -6 to Annex-3: List of Karachi Based Sea Food Exporters

S. No	Company Name	Type of Business	Tel No	Fax No	Name of Contact Person
01	[redacted]	[redacted]			[redacted]
02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
03	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
04	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
05	[redacted]	[redacted]	[redacted]		[redacted]
06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
09	[redacted]				
10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
12	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13	[redacted]	[redacted]			[redacted]
14	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
16	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
17	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
18	[redacted]	[redacted]			[redacted]
19	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
21	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
22	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
23	[redacted]	[redacted]			[redacted]
24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

S. No	Company Name	Type of Business	Tel No	Fax No	Name of Contact Person
25	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
26	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
27	[redacted]	[redacted]			[redacted]
28	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
29	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
30	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
31	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
32	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
33	[redacted]				[redacted]
34	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
35	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
36	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
37	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
38	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
39	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
40	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
41	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
42	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
43	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
44	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
45	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
46	[redacted]				
47	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
48	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
49	[redacted]	[redacted]	[redacted]		[redacted]
50	[redacted]	[redacted]	[redacted]		[redacted]

S. No	Company Name	Type of Business	Tel No	Fax No	Name of Contact Person
51	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
52	[redacted]	[redacted]			[redacted]
53	[redacted]	[redacted]	[redacted]		[redacted]
54	[redacted]	[redacted]			[redacted]
55	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
56	[redacted]	[redacted]			[redacted]
57	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
58	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
59	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
60	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
61	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
62	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
63	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
64	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
65	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
66	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
67	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
68	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
69	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
70	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
71	[redacted]				[redacted]
72	[redacted]	[redacted]			[redacted]
73	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]				[redacted]
74	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

S. No	Company Name	Type of Business	Tel No	Fax No	Name of Contact Person
75	[redacted]	[redacted]			[redacted]
76	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
77	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
78	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
79	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
80	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
81	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
82	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
83	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
84	[redacted]	[redacted]	[redacted]		[redacted]
85	[redacted]	[redacted]		[redacted]	[redacted]
86	[redacted]	[redacted]			[redacted]
87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
88	[redacted]	[redacted] [redacted]			
89	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
90	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
91	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
92	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
93	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
94	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
95	[redacted]	[redacted]			[redacted]
96	[redacted]	[redacted]	[redacted]		[redacted]
97	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

S. No	Company Name	Type of Business	Tel No	Fax No	Name of Contact Person
98	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
99	[redacted]	[redacted]	[redacted]		[redacted]
100	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
101	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
102	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Appendix -7 to Annex-3: List of participants of FGD meeting with trout fish farmers from Swat

Sr. NO	Name of Business	Name	Cell #	PTCL #	Address	Email
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
9	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
12	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Appendix -8 to Annex-3: List of participants of FGD meeting at the District Level

Sr. NO	Name of Business	Name	Cell #	PTCL #	Address	Email
List of Participants of FGD at Swat on 18 January 2012						
1.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
5.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
7.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
List of Participants of FGD at Peshawar on 25 January 2012						
8.	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]
9.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
12.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
List of Participants of FGD at Lahore on 27 January 2012						
16.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
17.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
18.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
19.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
21.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
List of Participants of FGD at Islamabad on 24 January 2012						
22.	[redacted]	[redacted]		[redacted]		[redacted]
23.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Sr. NO	Name of Business	Name	Cell #	PTCL #	Address	Email
					[redacted]	
24.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
25.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
26.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
27.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
List of Participants of FGD at Karachi on 27 January 2012						
28.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
29.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
30.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
31.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
32.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
33.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
34.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
35.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Annex -4 Data Tables

Table 1: Type of fish provided to customers

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi	Total
Marine	4%	7%	58%	37%	35%	32%
Fresh Water	85%	93%	39%	42%	41%	54%
Trout	11%	0%	3%	2%	0%	3%
Imported	0%	0%	0%	19%	24%	11%

Table 2: Reasons for low sale of fish in summer season

Response	Percent
Fish is a Seasonal Food	21%
People don't eat in summer (Hot season)	49%
Low Demand	10%
Other	10%
Low number of Trout Fish	10%

Table 3: Average minimum and maximum price of other type of fishes

	Average minimum rate	Average maximum rate
Swat	370	444
Peshawar	291	341
Rwp/Isb	517	804
Lahore	439	828
Karachi	328	486
Group Total	390	583

Table 4: Receipt of fish by Large Traders

Response	Percent
At Business Place	44%
At Fish Farm	10%
Market (Superstore/Retailers etc.)	11%
Fish *mandi* (Superstore/Retailers etc.)	36%

Table 5: Receipt of fish by Large Traders – City-wise break-up

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
At Business Place	0%	44%	64%	30%	81%
At Fish Farm	8%	16%	0%	22%	0%
Superstore/Retailers etc.	32%	8%	11%	3%	4%
Fish *mandi*	60%	32%	18%	46%	15%
Other	0%	0%	7%	0%	0%

Table 6: Selling of Fish (Cooked / Uncooked)

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
Yes	32%	36%	50%	44%	36%
No	68%	64%	50%	56%	64%
Total	100%	100%	100%	100%	100%

Table 7: Buyers of trout fish

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
Tourists	4%	10%	4%	0%	0%
Local population	4%	2%	11%	16%	0%
Both	8%	4%	4%	0%	0%
Not applicable	84%	84%	81%	84%	100%

Table 8: Category–wise Annual demand of Trout Fish (Surveyed vs. Cumulative)

	Demand Market Surveyed	Cumulative Demand
Fish Eating Point	26	26
Fish Whole Sale Market	88	835
Restaurants	47	66
Hotels	108	860
Super Stores	315	1051
Total	584	2918

Table 9: City–wise Annual demand of Trout Fish (Surveyed vs. Cumulative)

	Demand Market Surveyed	Cumulative Demand
Peshawar	18	65
Swat	21	73

	Demand Market Surveyed	Cumulative Demand
Rwp/Isb	75	279
Lahore	235	1286
Karachi	235	1216
Total	584	2918

Table 10: Demand of trout fish as per market surveyed

	Total Q1-Q4 (Winter Season)	Total Q2-Q3 (Summer Season)
Fish Eating Point	21	5
Fish Whole Sale Market	63	25
Restaurants	31	16
Hotels	57	51
Super Stores	213	102
Total	385	199

Table 11: Demand of trout fish (Metric Tons)

	Demand Market Surveyed	Cumulative Demand
Peshawar	11	6
Swat	2	19
Rwp/Isb	46	27
Lahore	170	65
Karachi	153	81
Total	385	199

Table 12: Rate currently ready to buy Trout fish

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi	Total
Up to 600 per KG	88%	60%	15%	88%	100%	68%
Rs. 601 to 900 per KG	8%	32%	19%	12%	0%	15%
Rs. 901 to 1200 per KG	4%	8%	4%		0%	3%
Not applicable	0%	0%	62%	0%	0%	14%

Table 13: Priority of buying trout fish

	Whole chilled	Whole Frozen	Fillet	NA
Peshawar	98	0	0	4
Swat	28	72	0	0
Rwp/Isb	11	35	0	54
Lahore	32	56	12	0
Karachi	44	40	16	0
Total	42.6	40.6	5.6	11.6

Table 14: Preferred packing option for supply of fish

Options	Percent
Styrofoam	66%
Card board/Loose packing in plastic bag	34%
Total	100%

Table 15: Mode of payment to Supplier

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
Cash	44%	16%	42%	68%	0%
Credit	56%	84%	35%	16%	88%
Both	0%	0%	23%	16%	12%
Total	100%	100%	100%	100%	100%

Table 16: Timeframe for payment to Supplier

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
1-2 weeks	93%	67%	22%	100%	27%
One month	7%	33%	78%	0%	73%
Total	100%	100%	100%	100%	100%

Table 17: Average transport charges (Rs./KG)

	Average
Swat	11
Peshawar	17
Rwp/Isb	29
Lahore	50
Karachi	12

Table 18: Payment of transportation cost

	Swat	Peshawar	Rwp/Isb	Lahore	Karachi
Yes	44%	40%	0%	16%	0%
No	56%	60%	100%	84%	100%
Total	100%	100%	100%	100%	100%

Table 19: Constraints in receiving trout fish

Constraints	Percent
Inconsistent supply	20%
High price as compared to other fish	33%
Takes time to receive trout fish	10%
Low trout demand as people taste not developed	22%
Other	4%
Total	100%

Table 20: Recommendations to increase sale of trout in the market

Recommendations	Percent
Promotion	61%
Increase production	1%
Increase weight of fish	30%
Proper packing and branding	8%
Competitive price	1%

Table 21: Market value of trout fish eggs provided by Firms Project (Current scenario)

Trout Fish Farm	Number eyed eggs provided	Reported mortality	Production Metric tons	Value @ PKR 600/kg (m)
1. [redacted]	285,000	Negligible	5	3.000
2. [redacted]	Provided fingerlings by Madyan T FF		12	7.200
3. [redacted]	As above		12	7.200
4. [redacted]	100,000	40,000	10	6.000
5. [redacted]	100,000	30,000	15	9.000
6. [redacted]	50,000	25,000	5	3.000
7. [redacted]	90,000	50,000	5	3.000
8. [redacted]	50,000	Previous stock sale	-	-

Trout Fish Farm	Number eyed eggs provided	Reported mortality	Production Metric tons	Value @ PKR 600/kg (m)
Total income from trout fish*			64[27]	38.40
Total income from jobs[28]				2.60
Present total value of 30 jobs for 6 farms				41.00
S. No.		Production Capacity (Kilogram)	Production Metric tons	Value @ PKR 600/ kg(million)
1. [redacted]	-	4427	4.5	2.700
2. [redacted]	-	1355	4.5	2.700
3. [redacted]	-	2053	2.0	1.200
4. [redacted]	-	2016	2.0	1.200
5. [redacted]	-	0	0	
6. [redacted]	-	1630	1.50	0.900
7. [redacted]	-	1560	1.50	0.900
8. [redacted]	-	1920	2.0	1.200
9. [redacted]	-	3848	4.0	2.400
10. [redacted]	-	9980	10.0	6.000
11. [redacted]	-	1890	2.0	1.200
Total			34	20.400

[27] *Present net economic value from Rainbow trout fish production worked out from its production of 64 Metric ton @ Rs.600 per kilogram (survey results for desired rate by buyers) comes PKR. 38.400 Million*

[28] *Economic value through jobs creation is based on one watch and ward person, two helpers and one supervisor @ Rs.7000 per month and Rs.15000 per month respectively*

Table 22: Trout Fish Farms in Malakand and Hazara Divisions

S.#	District	Number of fish farms	Production (Metric tons)	Remarks
	Private Sector			
1.	Manshera Kaghan Valley	10	14	3 Non Operational
2.	Battagram	1	3	Newly constructed
3.	Kohistan	15	15	Operational
4.	Chitral	13	7	Subsistence level
5.	Upper Dir	3	3	Non operational
6.	Shangla	4	4	Non operational
	Sub-Total	44	46	
	Public Sector			
1.	Madyan	1	10	Partially operational
2.	Chitral	2	5	Hatcheries and production unit
3.	Upper Dir	1	0	Hatchery
4.	Shangla	1	2	Hatchery
5.	[redacted]	1	1	Recently constructed
6.	Kohistan	1	5	Operational
7.	Manshera - Shinu	1	5	Hatchery and production unit
	Sub-Total	8	28	
	Total	**52**	**74**	

Source: Fisheries Department, Government of KPK

USAID Firms Project
info@epfirms.com