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POVERTY REDUCTION BY INCREASING THE COMPETITIVENESS OF ENTERPRISES (PRICE)

OCTOBER 2009-DECEMBER 2010 WORK PLAN

APRIL 2010

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Contract No. 388-C-00-08-00021-00

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

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ACRONYMS

AAS	Agricultural Advisory Society
BARI	Bangladesh Agricultural Research Institute
BLSC	Bangladesh Leather Service Centre
FIQC	Fish Inspection and Quality Control Office
FSB	fruit-and-shoot-borer
FY	fiscal year
GHERS	Greater Harvest and Economic Return from Shrimp
IPM CRSP	Integrated Pest Management Collaborative Research Support Program
ITC	International Trade Centre
M&E	monitoring and evaluation
MRDMCSL	Murail Cooperative Society
NGO	nongovernmental organization
PL	post-larvae
PRICE	Poverty Reduction by Increasing the Competitiveness of Enterprises
SME	small and medium enterprise

PREFACE

Important background information that underpins this work plan is incorporated by reference as follows:

Contract background. Please refer to USAID/Bangladesh and Request for Proposals No. 388-06-002 and Contract No. 388-C-00-08-00021-00 between USAID/Bangladesh and Chemonics International.

Program approach. Please refer to the Chemonics' proposal presented in response to Request for Proposals No. 388-06-002.

Gender guidance that informed this work plan. Please refer to "A Pro-poor Analysis of the Shrimp Sector in Bangladesh," produced for USAID/Bangladesh by the Greater Access to Trade Expansion Project, Development & Training Services Inc., under a task order from the USAID Office of Women in Development, February 2006, and the PRICE Sector Gender Analysis, July 2008.

Sector assessment resulting in target sectors. Please refer to Sector Analysis and Recommendations Report, June 2008.

Guidance on aquaculture that informed this work plan: Please refer to "Key Constraints, Opportunities, and Probable Solutions in Aquaculture Sector in Bangladesh," by Abul Hossain, PRICE Project, December 2008.

Guidance on leather that informed this work plan. Please refer to "Strategy for Developing the Leather Sector of Bangladesh," by The Leather Sector Business Promotion Council in collaboration with the International Trade Centre (ITC), July 2006.

Guidance on horticulture that informed this work plan. Please refer to "Constraints and Opportunities Facing the Horticulture Sector in Bangladesh," by Abt Associates in conjunction with Farm2Market Agribusiness Consulting and the South Asian Entrepreneurship Development Facility, November 2006. Also, refer to "Report on Crop Selection Workshop for the PRICE Project," by Bruce Brower and Enrique Rivas, August 2009.

INTRODUCTION

This work plan covers October 2009-December 2010 as a result of Contract Modification No. 2, which established the fiscal year, rather than the calendar year, as the project planning period.

As a result, this work plan overlaps with PRICE's currently approved work plan, which covers the 2009 calendar year. The project and USAID agreed that this work plan will cover 15 months and will overlap with one quarter of the FY 2011 work plan.

PRICE Objective

Reduce poverty sustainably by promoting the broad-based development and competitiveness of the aquaculture, horticulture, and leather products sectors in Bangladesh.

PRICE is working to reduce poverty in Bangladesh by promoting the market-based development of three sectors selected for their high potential for generating sustainable jobs, sales, and investment: the aquaculture, horticulture, and leather products sectors.

PRICE seeks to promote broad-based and pro-poor growth in these three sectors by implementing interventions that address key constraints to competitiveness, while integrating large numbers of small and medium enterprises (SMEs). This requires an understanding of the value chain — from input suppliers to processors to end-market buyers, of the business environment under which it operates, and of the economic agents that participate in it. Through its interventions, PRICE will help these economic agents understand the benefits of working together to increase the competitiveness of the value chain and, through cost-sharing arrangements that reduce risk, will help SMEs improve their processes and products so they have access to more and better markets — domestic and international.

I. PROGRAM-WIDE AND EQUITY INTEGRATION ACTIVITIES

A. Program-Wide Activities

Some activities span multiple sectors or the entire project. For example, all activities related to provision of project leadership and support, office expenses, work planning, value chain training, and equity integration training benefit the entire project. Strategies and training to address limited information and communications technology use in each sector can also be accomplished centrally.

Support for expanded access to finance by members of each value chain is also crosscutting. It will be addressed during ongoing sector support activities through active contact with local finance institutions. In addition, PRICE will continue exploring with USAID/Bangladesh the viability of pursuing a Development Credit Authority guarantee facility to support SMEs in our three sectors.

This work plan will be implemented largely by providing technical assistance, training, and other support conducive to value-chain development. PRICE will provide this support to individuals and groups of farmers and entrepreneurs, whose commitment will be verified by their willingness to cost-share in proposed interventions.

PRICE will coordinate with the Ministry of Commerce and the Business Promotion Council, for its lead role in implementing the Technical Assistance Proposal for “Bangladesh Economic Growth Program,” of which PRICE is also an integral part.

Additionally, we will team with a variety of counterparts from the public, private, and academic sectors, including:

Horticulture

Bangladesh Vegetable and Allied Fruits Exporters Association
Hortex Foundation

Aquaculture

Department of Fisheries
Aquaculture Certification Council, Inc.
Bangladesh Fisheries Research Institute
Bangladesh Fisheries Development Corporation
Bangladesh Frozen Food Exporter Association
Bangladesh Shrimp and Fish Foundation

Leather

Leather Sector Business Promotion Council
Bangladesh Finished Leather and Leather Goods Exporters Association
Leather Goods and Footwear Manufacturers and Exporters Association

To avoid redundancy and facilitate leverage, PRICE will coordinate activities with a number of other projects in Bangladesh. The project will also work with and take a leadership role in groups such as the Market Development Forum that bring together a number of projects and other groups for joint collaboration.

B. Equity Integration Activities

Senior PRICE managers will work with PRICE staff to ensure all activities focus on an equitable distribution of project benefits. To achieve this, we have ensured the following:

- We will provide targeted equity integration training for the entire PRICE staff.
- We will conduct a policy/procedural review to ensure that gender is considered in PRICE activities.
- Training will have a special focus on transferring valuable job skills to women.
- Senior PRICE management will ensure that project operations provide a greater-than-average focus on equity integration into project activities.

PRICE will develop operational relationships with producer organizations to expand our reach to poor women, youth, and other marginalized groups with job-enhancing training. Core equity integration functions will inform PRICE reports, outreach activities, monitoring and evaluation (M&E), and donor coordination activities.

II. HORTICULTURE SECTOR ACTIVITIES

A. Overview and Constraints to Growth

Horticultural crops are a key source of livelihood for millions of Bangladeshi smallholders, and of nutrition and food security for the entire country. From July 2008 to June 2009, this sector contributed \$3 billion to the economy. Horticultural crops occupy only 8 percent of agricultural land, or 1.2 million ha, but the sector contributes 20 percent to agricultural gross domestic product. Horticulture production is labor-intensive and, if managed properly, horticultural crops can provide significantly better net returns per hectare compared with boro rice. Therefore, the sector has great potential to increase income, create jobs, and reduce poverty in rural Bangladesh.

Horticultural production has seen an important expansion in the past few years. For example, total production of vegetables, excluding potato, rose from 7.28 million mt in 2004-2005 to 10.62 million mt in 2008-2009 (Department of Agricultural Extension). Still, with an estimated supply gap of 3.5 million mt just to satisfy the domestic market, there are ample opportunities for the sector to continue growing.

More than 140 horticultural crops are grown in Bangladesh, although a handful stand out from the rest. In particular, potato has shown remarkable growth in production and yield. Potato production has more than quadrupled in 10 years, from only 1.55 million mt in 1997-1998 to 6.46 million mt in 2008-2009. Today, potato occupies more than 425,000 ha, more than any other vegetable in the country, due to its uniqueness as a food and cash crop that can be stored and processed for value addition. Eggplant is a distant second to potato in respect to acreage (47,745 ha), income, production (338,012 mt annually), and number of people involved in the value chain. Bangladesh is one of the 10 leading eggplant-producing countries of the world and this is one of the few vegetable crops that can be grown year-round on a commercial basis. Other important vegetable crops include okra, radish, gourds, pumpkin, tomato, cabbage, and cauliflower.

Among the 10 major fruit crops grown in the country, mango is the most popular and commercially important. Although it is grown all over the country, the highest-quality mango is in the northwest. The area under mango cultivation is about 91,000 ha, with total production of about 900,000 mt (Bangladesh Department of Agricultural Extension, 2009). Besides mango, two other important crops are jackfruit and banana, both of which are only consumed fresh.

Unmet domestic demand for fresh fruits and vegetables inhibits exports, as well as processing. Freezing and processing accounts for less than 1 percent of total production, and exports — mostly to ethnic Bangladeshi markets — stand at only \$45 million per year.

Among the major constraints to growth of the sector are:

- Limited access to quality seed, planting materials, and other inputs leads to low productivity.
- Rudimentary farming methods and technologies.

- Lack of organized farming and economies of scale in buying inputs, tilling land, as well as selling the produce.
- Small farms often do not qualify for institutional credit, forcing farmers to use low-quality inputs.
- Organic content in agriculture soil in most parts of Bangladesh is less than 1 percent (the critical limit is 3 percent) and depleting rapidly. Decaying organic contents in the soil forces farmers to use a higher rate of chemical fertilizer, leading to further deterioration of soil health.
- Farmers' poor knowledge of proper harvesting techniques and post-harvesting handling results in an alarming 26 percent crop loss, as well as quality deterioration.
- Absence of cold chain facilities and poor transportation and packaging lead to substantial quality and quantity losses for horticulture produce and limits farmers to local markets only.
- Inefficient and unsafe application of pesticides leads to health hazards for producers and consumers, and is a key constraint to exporting fresh horticulture produce.
- A weak supply chain and lack of market information alternatively create avoidable gluts and scarcities.
- An orientation toward subsistence farming and a lack of market information often lead farmers to produce crops they are good at producing, rather than crops they can sell at better prices.
- Inadequate access to finance and liquidity crises lead some farmers to distress selling.

B. Progress to Date

During FY 2009, PRICE worked to improve farm productivity, post-harvest handling, and market links in partnership with four seed producers, four organized farming groups, and two farmers' associations. Through the seed companies, 1,300 seed dealers were trained; they, in turn, trained 60,000 farmers on proper use and benefits of quality seeds. PRICE also assisted potato producers and exporters in enhancing the quality of their product and increasing yields.

PRICE partnered with farmers' organizations representing 2,350 vegetable farmers to promote contract farming conducive to efficient production and sale of safe vegetables. PRICE also worked with two farmers' associations that represent 950 farmers, to improve farm productivity and establish links with exporters.

C. Strategic Focus

Because horticulture is such a vast sector in Bangladesh and covers the entire country, PRICE will focus its activities and limited resources on selected regions and crops where significant results could be obtained during the lifetime of the project. To reach thousands of small horticulture farmers across large regions, PRICE will partner with farmers' associations and sponsor entrepreneurs of contract farming systems, processing industries, exporters, input and extension service providers, and rural nongovernmental organizations (NGOs), among others.

C.1. Crops

PRICE will take an integrated, value-chain approach in promoting development of three horticultural crops: potato, eggplant, and mango. These crops have been selected after consultations with experts and stakeholders, considering a series of criteria that include geographical coverage, production volume, comparative advantage, commercial orientation, number of farmers involved, adaptability, contribution to food security, and involvement of other donor projects.

Potato has emerged as a major and successful October-March winter crop, with an estimated production value of \$1.3 billion in 2007-2008 — second only to rice. Potato production is generally profitable for farmers, but there is also significant room for increased productivity. Potato can be stored and processed to add more value, and, because of its nutritional qualities and adaptability to climate change, the crop can widen the food supply base, helping to reduce the risk of food shortages.

PRICE will facilitate in increasing production and supply of quality potato seeds to farmers; will promote contract farming so farmers can get access to technology, inputs, and markets, and will promote market links with processors and foreign buyers.

Eggplant is one of the first choices by farmers for year-round cultivation, but poor farming practices have led to low productivity, high level of disease infestation, and excessive use of insecticides. Average yield varies from 6 to 7 mt/hectare, far below the world average of 17 mt (U.N. Food and Agriculture Organization). Bangladesh is considered a center of origin of the crop, and many varieties are available and widely cultivated, including Signath, Islampuri, Khotkhotia, and Jhumka. However, through the years, these varieties have degenerated and need to be cleaned, improved, and replaced with higher-yielding varieties.

PRICE's strategy is to focus on increasing productivity and minimizing crop loss through technological interventions. It also aims to enhance access to safe eggplant for consumers. Safe crop cultivation through technologies — particularly seedling grafting and biological pest control measures — will help produce safe vegetables by maintaining the environment and reducing the cost of production for farmers, who are spending excessive amounts on insecticides. PRICE will also work with research institutes and initiatives such as the USAID-supported Agricultural Biotechnology Support Project II to disseminate among farmers improved and/or transgenic eggplants resistant to pests and disease.

Mango is indigenous to Bangladesh and one of its most popular and important fruit crops. Mango grows commercially in the north and northwest, especially in deep soils rich in alluvium loam and with a substratum of loose gravel. There are signs of a gradual shift from rice to mango in the northern area, which is not only an adaptation to increasing water stress, but also for the greater economic benefits it implies.

However, average yield is much below the world average, and local production is insufficient to meet domestic demand. Productivity is constrained due to poor management practices, prevalence of disease, use of high doses of pesticides, and unavailability of good-quality planting materials. Widespread adoption of improper

ripening methods, incorrect pre- and post-harvest handling, and use of substandard containers and transports all contribute to high post-harvest losses.

PRICE will work to increase the area under mango cultivation and replace exhausted gardens with declining productivity. We will assist with access to quality planting material and will work to improve pest and production management, post-harvest handling, and shortening the long supply chain to market.

C2. Geographical Area

PRICE will focus on the Rajshahi area, in the northwest, and the Jessore area, in the southwest. Both have a high potential for horticultural production throughout the year. The northwestern region has a drier climate with less wind, good irrigation facilities, and a fairly good road network. Groundwater is easily accessible in most of the area for year-round cultivation, the incidence of flood is comparatively low, and drought is moderate. Soils are suitable for a wide range of horticultural crops. Also, farmers in these regions have more experience and interest in producing horticultural crops commercially.

Potato cultivation has shifted from the central part of the country to the north due to agro-climatic advantage. At present, more than 70 percent of potato is grown in the northwest, where cooler and longer winters allow farmers to grow two crops during the winter period. This is also an important fruit area; 80 percent of good-quality mango grows here. The southwest region is also important for growing good-quality mango, year-round vegetables and spices. Most vegetable seeds also are grown in this area due to long periods of cool and dry weather.

C3. Crosscutting Issues

PRICE will develop a reduced number of initiatives to mitigate constraints that are affecting the horticulture sector as a whole; in particular, the loss of organic matter in the soil, lack of appropriate models for post-harvest handling, and insufficient access to market information. The planned crosscutting interventions are presented in Subsection D4, below.

C4. Vision to 2013

- Productivity of potato, brinjal, and mango crops of PRICE partners increased by 10 percent
- Availability of quality seed and planting materials of the targeted crops increased by 10 percent
- 15 contract farming systems established for potato and other crops
- Post-harvest losses of PRICE partners reduced by 10 percent
- Safe crop production schemes for brinjal and mango introduced and practiced
- 10 percent of the mango area in Chapainwabanj brought under modern farming; productivity increased by 15 percent

D. Interventions for October 2009-December 2010

D1. Potato

Facilitate production of quality potato seed to increase availability. About 600,000 mt of quality potato seeds are required every year, but the Bangladesh Agriculture Development Corporation supplies only 3 percent, and the private sector another 2 percent, while imports account for 1.5 percent. PRICE will provide technical support to at least two potato seed-producing enterprises to produce good-quality seeds from foundation and registered seeds. Additionally, we will extend technical support to about six seed-producing entities to produce disease-free plantlets by using micro-propagation techniques. We will then link them with seed-multiplication enterprises to grow certified seeds from plantlets and tuberlets and ensure supply to contract farmers and farmers' associations. PRICE will also explore new options to obtain high-quality, certified processing-variety seed locally and from abroad.

Promote potato contract farming. Potato contract farming will be encouraged to enhance farmers' access to the farming inputs, knowledge, and information required to practice improved farming techniques, better access to value chain financing, and guaranteed markets. This will be done by involving potential contract entrepreneurs, potato seed producers, and the processing industry. PRICE will continue to support two existing contract-farming enterprises and will assist several additional outgrower potato schemes in the northwest. Our target will be to increase the per-hectare yield of assisted farmers from 8 to 14 mt by 2010. About 6,000 farmers grouped in eight associations will be assisted during the period.

Support in developing knowledge and skill of farmers. PRICE will collaborate with farmers' associations, cooperatives, and rural NGOs, such as GUK Enterprise Development, in designing and implementing training courses on improved farming techniques, as well as in establishing demonstration plots.

Promote use of balanced fertilizer and organic fertilizer. PRICE will continue to support dissemination of knowledge on required fertilizers (doses and applications) to potato farmers and establish links with producing companies for better access to ready-to-use organic fertilizer.

Promote links between farmers and processing industries. PRICE has a memorandum of understanding with Golden Harvest, a frozen vegetable processing company, to help it source potatoes from project-assisted farmers. PRICE will continue facilitating establishment of links between farmers and other processing industries and outgrowing enterprises.

D2. Eggplant

Promote production of hybrid and high-yielding variety seed. PRICE will assist in linking the Bangladesh Agricultural Research Institute (BARI), the Agricultural Biotechnology Support Project II, and private seed companies engaged in advanced research, for developing and disseminating fruit-and-shoot-borer (FSB)-resistant eggplant. PRICE will assist in delivering training and technical assistance for seed-producing farmers and entrepreneurs, and will facilitate the access of interested

farmers and out-growers to FSB-resistant and high-yielding seeds with a wide range of resistance attributes. Presently PRICE-assisted farmers are producing 6 to 7 mt of eggplant per hectare, which is expected to rise to 8 to 10 mt per hectare through introduction of high-yielding, disease-resistant varieties and adoption of modern technology.

Improvement in seedling-raising technology. Seedling raising technology, in association with other scientific techniques such as grafting, is useful to control bacterial wilt and thus reduce crop losses. In regions with greater prevalence of the disease, particularly the southwest, PRICE in collaboration with BARI IPM CRSP project will facilitate training on grafting to farmers and demonstrate the benefits of using the technique among egg plant farmers.

Promote biological pest control and associated methods for safe crop production. Safe crop production, particularly for eggplant, is important considering the excessive doses of pesticide currently being applied. PRICE, in close collaboration with BARI IPM- CRSP, will promote safe eggplant production by training, demonstrations and linking bio-pest producing companies with local retailers. PRICE will also support associations in establishing and running plant clinics for managing crop protection. About 2000 eggplant farmers will be brought under the program for producing safe vegetables.

Promoting a market for safe eggplant. The safety issue in eggplant is important to knowledgeable consumers, in Bangladesh and abroad. PRICE will help promote the virtues of safe production and will assist safe eggplant producers in connecting with local and export markets.

D3. Mango

Assist associations and stakeholders in introducing improved farming techniques. Yields are low because many producers pay little attention to production management and depend mainly on nature, except for occasional spraying when there is an outbreak of disease. PRICE will work with mango growers' associations to improve the knowledge and skill of farmers, absentee owners and the workforce to increase yields from the present level of 7 mt per hectare to 8.5 mt per hectare in the Kansat area in 2010, by involving 250 farmers in 283 ha of mango orchards of elite varieties.

Promote production of elite planting materials from mother orchard. A number of nurseries are now engaged in producing mango-planting materials. However, the best quality within a variety can only be ensured if selection and sourcing of plant materials is done properly, based on the mother orchard. PRICE will support selected nurseries in improving the quality, based on the principles and guidelines for producing elite planting materials.

Encourage rejuvenation and replacement of age-old orchards with declining production. Rejuvenation and replacement of exhausted orchards will be encouraged as a medium- and long-term approach to increase production and productivity.

Promote safe and effective pest control. Disease can be avoided by taking precautionary measures through proper crop management and adoption of prophylactic controls; similarly, pesticide use can be rationalized by calculating the economic threshold level of pest attacks. Farmers and pesticide service providers will

be trained and encouraged to follow proper practices to achieve crop protection with minimum use of pesticides, thus increasing safety and reducing costs.

Support mango farmers in adopting proper pre- and post-harvest handling. Proper pre- and post-harvest handling minimizes loss and increases shelf life. PRICE will train mango producers on pre- and post-harvest techniques and practices that will decrease losses and improve quality.

Promote more efficient marketing channels. Mango passes through many intermediaries before reaching consumers, which dilutes profitability and discourages investment in value-addition activities. PRICE will analyze options to shorten and strengthen the marketing chain.

D4. Crosscutting Interventions

Promoting production and use of compost for vegetable producers. PRICE will promote the use of compost as a good farming practice that improves soil health for higher yield and quality. The project is already working with Reah Fertilizer and GKSS Enterprise, and plans to collaborate with several more compost producers, facilitating their access to technical knowledge for producing compost using locally available biomass, assisting them in marketing their products, and educating them on the benefits of compost use.

Linking horticulture producers and processors to international markets. PRICE will help horticultural producers and processors identify potential export markets, as well as specialized trade fairs such as the Gulfood Exhibition in the United Arab Emirates and the U.K. Food & Drink Expo, where they may be able to promote Bangladeshi products. On a cost-share basis, PRICE may support interested exporters in preparing for and participating in specialized trade events such as these.

Strengthening farmers' associations and cooperatives. Farmers' organizations often lack basic information about their members, as well as the capacity to provide them with needed services. PRICE will explore ways to increase their organizational capacity in a way that benefits their production and sales.

Piloting a field pack station to demonstrate post-harvest loss reduction. Due to the nature of the product; a lack of awareness, understanding, and knowledge; and poor infrastructure, post-harvest losses of most horticultural crops are high. PRICE may facilitate in creating awareness on the importance of better harvesting and post-harvest handling at the farm level by piloting a model field pack station that can be replicated by farmers' groups.

Promote safe horticultural produce in the field and the factory. Sustainable and safe horticultural crop production and marketing is the future of the sector. Good agricultural practices will be promoted at the farm level, as well as biological pest management. Horticultural processors also may be assisted in safe food production and certification.

Help improve the market information system. PRICE will assess the existing market information system and look for ways to strengthen it to improve the decision-making process of farmers in production, harvesting and marketing.

Facilitate increased access to finance. Access to institutional finance is difficult for most horticulture farmers. Microfinance products in rural Bangladesh do not cater to the demand of farmers who need harvest-based repayment schedules. PRICE will seek to increase farmers' access to finance by engaging more enterprises in contract farming and working with microfinance organizations to develop financial products based on crop-specific needs.

E. PRICE Horticulture Partners in FY 2010

Murail Rural Development Multipurpose Cooperative Society Ltd., GUK Enterprise Development, Kansat Mango Farmers Multi-purpose Cooperative Society Ltd., Vaterchar Krshishak Unnayan Bahymukhi Samabi Samity, Golden Harvest Agro Industries Ltd., AID Agro Mart, Konika Seed Company, EFDAF Agro Business, Padma Seed Company, Organix, Syngenta, Laltir, Bangladesh Fruits Vegetables & Allied Products Exporters Association, Agriculture Advisory Society, RYA Fertilizer, and GKSS Enterprise, among others.

F. Expected results in the Horticulture Sector in FY 2010

Our goal for the period is to generate three million dollars in new sales and approximately 1,000 new jobs. We also hope to help generate \$400,000 in private investment. Around 6,500 farmers will be assisted in improving their technology, 750 will receive assistance to improve their management practices, and around 30 are expected to get access to credit. 700 farm workers will also be trained.

III. AQUACULTURE SECTOR ACTIVITIES

Bangladesh is one of the world's leading freshwater fish producers, from open water and farming. Fresh and salt-water shrimp are also produced through farming. The country has extensive freshwater resources in the form of ponds, natural depressions, lakes, canals, rivers, and estuaries, covering about 4.9 million ha (Bangladesh Department of Fisheries, 2009). There are 251 species of freshwater fish, 402 species of marine and brackish-water fish, 16 of prawn, 39 of shrimp, four of lobster, 40 of crab, and 49 species of bivalves (*Encyclopedia Flora and Fauna of Bangladesh*, vol.17, 2007).

On the basis of salinity, aquaculture in Bangladesh can be classified as fresh water or brackish water; freshwater aquaculture mainly deals with 30 species of fish, including 12 exotics, and with a single freshwater prawn, known as *golda*. Brackish-water aquaculture targets mainly black tiger shrimp, known as *bagda*, and mullet, a brackish-water fish. Fisheries and aquaculture combined provide more than 60 percent of the animal protein consumed in Bangladesh, generate \$500 million in exports and \$3.5 billion in domestic sales, and employ more than 11 million people, mostly in rural areas.

Fish aquaculture in Bangladesh is mainly for domestic consumption; a small amount is exported to ethnic markets. In contrast, shrimp aquaculture is an export industry oriented mainly to markets in the United States and the European Union. Shrimp and prawn from Bangladesh are exported after freezing, with little value added to the final product.

Because of the significant differences between the fish and the shrimp sectors, in terms of end markets, value-chain actors, constraints and potential, we have divided aquaculture into two sectors for work-planning purposes.

A. Fish Subsector

A1. Overview and Constraints to Growth

Strong involvement of small farmers; significant opportunities for equitably generating sales, jobs, and investment; prospects for female participation, family nutrition, and food security, and potential ability to cope with climate change, have led PRICE to work in this sector. Fish aquaculture produces almost 1 million mt, worth \$1.4 billion, more than four times the value of shrimp sales. However, only about \$100 million of this represents export sales, primarily to ethnic markets in the United Kingdom, the United States, and the Middle East. It is estimated that around 4.1 million people are involved in finfish aquaculture.

Fisheries and aquaculture in Bangladesh play a major role in alleviating protein deficiency and malnutrition, and generating employment and foreign exchange earnings. The present per capita annual fish consumption stands at about 17.23 kg/year, but this could easily double to meet the populations' nutritional needs, which depend heavily on fish protein. With the huge water resources of the country still being used under capacity, Bangladesh also has great potential to increase its fish exports. On the production side, annual fish yield per hectare in the ponds of

Bangladesh in 2007-2008 was 2.66 mt, with a potential to increase to 7 to 8 mt (Department of Fisheries, 2009). Thus, Bangladesh has the opportunity to increase the area under fish production, as well as the yield from it.

Among the main constraints to growth in the fish sector are:

- Low productivity and production because of inadequate farming methods, low-density farming, and lack of appropriate intercropping.
- Inbreeding problems with indigenous and exotic farming species.
- Fish seed is stressed due to faulty handling and transport. Responsible nursing and transportation of healthy fry and fingerlings to farmers is one of the limiting factors for better yield and overall production. Fish seed is a seasonal product, but demand for fingerlings is increasing year-round due to diverse farming methods and two to three crops per year.
- High-density farming also depends on other inputs, such as feed, fertilizers and micro-nutrients, which are in scarce supply.
- Seasonal aquaculture is under strain because of climatic change.
- An inadequately integrated aquaculture is unable to fully contribute to food security.
- There is gender bias against women and weak institutional and financial support of poor farmers.
- Inadequate post-harvest handling and cold chain management leads to spoilage.
- Unhygienic dry fish production and non-traditional export items.
- Inadequate post-harvest handling, including lack of proper cold chain management, questionable ice and insulation devices, a poor transport system, and inadequate storage lead to rapid quality deterioration, contamination and spoilage.

A2. Progress to Date

PRICE has provided technical assistance to five organized farming associations in Mymensingh, Pabna, Barguna, and Comilla-Noakhali districts, and to a fish seed traders' association. The technical assistance has been for increased farm productivity, access to better inputs, market links, and access to finance. Recently PRICE started working with six new fish farmers' associations in Bogra, Jamalpur, and Noakhali area, as well as with a feed manufacturing mill and an aquaculture-related micro-inputs company.

By the end of FY 2009, PRICE provided technical assistance to more than 3,500 farmers, almost half of them women, and management training to more than 1,100 farmers. It strengthened the organizational capacity of several farmers' organizations and assisted them in establishing links with quality seed-producing agencies, hatcheries, and nurseries. PRICE also promoted training on water and health management, and group marketing of harvested fish.

The project also assisted organized farmers in establishing links to microfinance sources. So far, 129 micro- and small farmers took microcredits ranging from 3,000 to 15,000 taka, with the association or group serving as guarantor.

A3. Strategic Focus

Because the fish sector is so large and covers the entire country, PRICE decided to concentrate on priority regions — Mymensingh, Khulna/Jessore, Bogra, and Cox's Bazar — and to focus on three high-potential species: carp, tilapia, and *pangus*. To achieve improved productivity and good aquaculture practices for an appreciable mass of fish farmers, PRICE will work through organized farmers' groups, planning to reach 10,000 fish farmers in FY 2010 and close to 30,000 by the end of the project.

To improve farm management and expand access to better quality feed and inbred-free spawns, PRICE will enlist the services of technical consultants who will provide customized assistance to organized farming associations that gather together large numbers of micro-, small, and medium fish farmers, many of them women. Farmers will be trained in groups with group leaders; follow-up training for group leaders may be provided. The group leaders will provide up-to-date information and knowledge to member farmers, as well as providing performance data to PRICE.

PRICE will work to increase productivity, contribute to food security, and facilitate climate change adaptation through a variety of mechanisms, including:

- Training farmers to upgrade farming techniques and management
- Adding value to fish seeds through over-wintering
- Transforming seasonal farming to perennial under changing climatic conditions
- Providing embedded services to farmers through fish seed traders and micro-input sellers
- Promoting access to high-quality inputs through group procurement and links

We will emphasize creating awareness of responsible farming and non-use of banned substances so as not to degrade eco-systems and biodiversity, through training, leaflets, posters and manuals. The project will promote eco-friendly, crop-rotational, and integrated fish-rice and horticultural integrated farming.

Wastage and losses due to spoilage, cross-contamination during post-harvest handling and poor cold chain management could be significantly reduced with responsible mitigation measures. PRICE will assist in establishing links for group marketing and responsible transportation and storage for safe and hygienic fish-selling in local markets. PRICE will also work to assist in producing hygienic dry fish for domestic consumptions and export, and explore export possibilities of some non-traditional fish items, such as dried airbladder and dried catfish fat.

Female participation in aquaculture is low — 3 percent nationally. Our experience shows that more women can be incorporated into this important economic activity in rural areas, resulting in not only gender empowerment, but also increased household income and family-based nutrition. PRICE will continue to work for increased participation of women during 2010 and beyond.

The project has had successful experiences teaming with microfinance NGOs, which can organize farmers' groups and provide them with financing, but which lack the technical expertise to ensure the results of their investment. PRICE will continue to

partner and leverage resources with local NGOs interested in financing aquaculture activities.

A4. Interventions for October 2009-December 2010

Improved farming technology and management. The project will work with members of partner associations to train them on improved fish farming techniques. Roughly 10,000 fish farmers grouped in about 12 associations will be assisted on improved/high-density/semi-intensive farming methodologies to increase yields. Currently, PRICE-assisted farmers are producing using diverse farming methods mostly 3 to 4 mt of fish per hectare; the project expects to increase this to 6 to 7 mt per hectare by the end of 2010, although exceptional yields of up to 80 mt may be achieved.

Integrated farming for year-round production. We will facilitate farming integration among the farmers' associations to produce multiple crops seasonally and more than one crop by polyculture.

Access to better inputs. PRICE will assist partner associations in group procurement of high-quality inputs (inbreed-free fry and fingerlings, high-quality feed and other inputs) for farmers to increase yield and quality. The project will also continue assisting the fish seed traders' association in Mymensingh — *Digherkanda Mostapona Beboshahi Kollan Bhohumuki Somity* — in supplying fish seeds to farmers with embedded information services. We also will facilitate a supply of better quality inputs to the newly signed feed mill, Fishtech Ltd.

Assist institutional capacity building. The project will provide technical assistance to strengthen the capacity of farmer groups and associations to provide better member services for increased fish production.

Reduce post-harvest losses by improving post-harvest handling and cold chain management. PRICE will design field-based and other post-harvest handling remedies and educate farmers/associations, to ensure ongoing post-harvest handling vigilance. The project will also design farm-based cold chain management solutions, design ice plant water quality solutions, and educate farmers/associations, to ensure ongoing cold chain management vigilance. As a result, awareness of the importance of responsible post-harvest handling and cold chain management will increase.

Improve farmers' forward links in the domestic market. PRICE will train association farmers on group marketing of fish, to increase their bargaining power. We will link the farmers' associations to wholesalers and supermarkets, enabling bulk-selling to be guaranteed by sufficient quantities of product. We will organize workshops to establish such links.

Link fish processors to fish suppliers. PRICE will link farmers with processing plants that are interested in exporting farmed catfish (*pangus*). We will conduct a linkage workshop between producers and processing plants for year-round supply of *pangus* at negotiated prices.

Assist access to institutional credit. PRICE will assist fish farmers and farmers' associations in accessing institutional credit and bank loans by arranging workshops,

establishing links, and building capacity to develop business plans. We will also encourage associations to introduce mechanisms for providing collective collateral for association members seeking loans.

Analyze the domestic and export market for Bangladeshi fish. The project will conduct a study to analyze market tendencies and opportunities for catfish and tilapia, domestically and abroad.

A5. PRICE Fish Partners in FY 2010

Trisal Fish Farmers Somity in Mymensingh; Phulpur Fish and Prawn Farmers Association in Mymensingh; Trinamool Manobik Unnayan Sangstha in Pabna; Rakhaing Development Foundation in Barguna; Society for Social Services in Comilla, Noakhali districts; Kahaloo Matshya Chashi Samoby Samity, Mourail Matshya Chashi Samoby Samity and Pachpir Bazar Matsya Chashi Samoby Samity, in Bogra; Nokla Motsojibi Somity in Sherpur; Bamunji Beel Motsojibi Somity in Jamalpur; Jana Seba Kendra in Noakhali; Digherkanda Mostapona Beboshahi Kollan Bhozumuki Somity, a fish seed traders' association of 75 members, in Mymensingh; and Fishtech Ltd., a feed-processing plant in Gazipur. Other partners may be selected during the working period.

B. Shrimp Subsector

B1. Overview and Constraints to Growth

The shrimp industry focuses mostly on exports, and is one of the country's major foreign currency earners. The sector also has great potential for rural job creation and poverty alleviation, already accounting for more than 900,000 jobs. However, shrimp production has faced major internal challenges and issues related to its growth and competitiveness, including low productivity and lapses in compliance with international food security and labor standards. These problems, compounded by the global recession and Cyclone Aila in May 2009, resulted in a significant decline in shrimp exports, from \$445 million earned in Bangladesh FY 2008 (July-June), to \$353 in FY 2009.

Shrimp is a high-value export commodity. Its main destinations are high-end consumer markets in Europe and the United States. These countries have stringent quality specifications, especially for importing food items. Maintaining hygiene and food safety standards is therefore a prime issue for the shrimp subsector. Multiple rejections of shipments to Europe during 2009, due to antibiotic contamination, led the Bangladeshi industry to declare a temporary voluntary ban on exports to that region, to avoid potential sanctions. Another important issue for export market access is compliance with local labor laws. Shrimp exports to the United States are at risk due to the perception of improper labor practices in Bangladeshi processing plants.

Despite the high demand for Bangladeshi shrimp in the export market, productivity remains low, and the sector's participation in the world market is only 3 percent — much below its potential. Traditional and low-density farming methods, rudimentary technology, and farmers' inadequate access to virus-free post-larvae (PL) are among the root causes contributing to this problem.

The main crop in Bangladesh is black tiger shrimp, known as *bagda*. *Bagda* faces mass mortality when affected by the white-spot virus. An outbreak of this deadly disease during 1994-1995 virtually eliminated the emerging high-yielding semi-intensive form of *bagda* farming in the country. Combating white-spot virus in *bagda* requires screening of PL for the disease and promoting the use of clean PL among farmers. However, in Bangladesh, screening of PL is not obligatory, and mostly unscreened PL are used. There is a deficit in Bangladesh of screened PL for *bagda* and of hatchery-produced PL for *golda*.

Golda farming, and in some cases *bagda* as well, especially in family-owned small, closed-water bodies, is done following traditional methods where farmers depend on questionable PL inputs from input sellers. Poor-quality inputs, seed, feed, and fertilizer hamper growth of farmed *bagda* and of *golda* in polyculture with non-carnivore plankton-feeding fish. Poor-quality supplemental feed increases pollution, and commercially available pellet feeds are suspected of containing parent drugs that lead to creation of antibiotic metabolites in farmed *golda*. The lack of traceability of Bangladeshi shrimp — due largely to fragmentation of the farming units — makes it difficult to identify sources of banned chemicals and antibiotics.

Inadequate post-harvest shrimp handling, including lack of proper cold chain management, questionable ice and insulation devices, a poor transport system and storage lead to rapid quality deterioration, contamination and spoilage. Cross-contamination is also a serious problem in harvested *bagda* and *golda*. Bangladesh mainly exports frozen blocks of prawn and shrimp without value addition and hardly takes advantage of higher-margin export markets for ready-to-cook and ready-to-eat products.

In sum, PRICE has identified the following constraints to growth and development of the shrimp sector:

- Low productivity and overall low production
- Lack of high-quality inputs
- Problems with international food safety compliance and poor capacity for testing
- Poor international image on compliance with labor laws
- Scarce value-added product development
- Poor traceability and presence of questionable substances in *golda*
- Weak institutional support to resource-poor farmers
- Changes of weather in shrimp and prawn farming area and its adverse effects
- Price slide of shrimp/prawn in international market due to global recession
- Complaints about shrimp farming invading agricultural, food-producing areas
- Inadequate post-harvest handling and cold chain management

B2. Progress to Date

PRICE has provided technical assistance for increased productivity to more than 2,700 farmers in the Khulna region through its Greater Harvest and Economic Return from Shrimp (GHERS) initiative, subcontracted to World Fish Center for 15 months, starting in September 2008. These farmers received training and counseling on relatively high-density farming, using screened PL. Additionally, PRICE is working

with seven contract farming systems in southwestern Bangladesh involving 1,900 farmers to promote increased yields and profit. The outgrowers have been encouraged to use screened PL and traceable feed and fertilizer, and 1,100 farmers have been trained on improved management practices. To promote the supply of better inputs, a shrimp hatchery and a fish feed mill have also been assisted.

To strengthen compliance with international food safety requirements, the project has been working with the government of Bangladesh to increase the capacity of the Department of Fisheries' Fish Inspection and Quality Control (FIQC) laboratory, so export consignments can be tested and screened accurately before export. PRICE therefore arranged five training programs (including a training-of-trainers course for eight master laboratory trainers) comprising 73 trainees, to assist the FIQC in complying with international food safety requirements related to microbial, chemical, antibiotic and general testing procedures. In turn, the eight master trainers were tasked with providing training for 100 additional laboratory operators.

In response to allegations of violation of child labor rules, PRICE engaged the Bangladesh Shrimp and Fish Foundation to audit and validate compliance of 10 processing plants with Bangladeshi labor law and then developed and implemented compliance courses for workers, managers and owners of those plants.

PRICE has also assisted a government of Bangladesh campaign to create awareness of the dangers of using nitrofurantoin antibiotics and — in collaboration with the Bangladesh Fisheries Research Institute — is conducting an experiment in Cox's Bazar to trace possible sources of toxic elements in farmed prawns.

B3. Strategic Focus

World demand for shrimp remains strong despite the economic downturn, with more countries joining the list of importers. This, and the fact that Bangladesh constitutes a small fraction of world supply, means it has ample room to increase shrimp exports. Processing capacity is being used at only 20 percent, so the limitation for growth is at the farming level. This is one of the main reasons PRICE is prioritizing this segment of the value chain.

About 75 percent of *bagda* and *golda* farming is concentrated in southwestern Bangladesh, mainly in the greater Khulna districts. There is also significant *bagda* production in Cox's Bazar and *golda* in Jessore and, to a lesser degree, in the Noakhali district. To make the best use of limited resources – and because other donors are already working on improving the *golda* value chain -, the project has elected to focus on *bagda* production in the greater Khulna areas, namely Khulna, Bagerhat, and Satkhira, planning to reach about 30,000 crop-rotational *bagda* shrimp farmers by 2013, which is equivalent to about 25 percent of all shrimp farmers in the Khulna region. PRICE will accomplish this largely by extending and intensifying the outgrowing schemes being implemented through its World Fish Center-operated GHERS initiative.

To strengthen the shrimp value chain and to enhance shrimp productivity and quality, the GHERS initiative will employ the following strategy:

- a) Incorporate new depot owners willing to become outgrowers and the shrimp farmers that will associate with them in subcontractor schemes.
- b) Program staff, together with depot owners/outgrowers, will organize farmer groups. Each group will select its own leader and work with an extension facilitator.
- c) WFC staff will provide capacity-building and orientation programs to the extension facilitators working for the depot owners/outgrowers. Once these extension facilitators are trained, they will coordinate two very important processes:
 - Transfer knowledge and skills to the farmers using information booklets developed for the program.
 - Coordinate the supply of traceable inputs by arranging bulk orders of shrimp seed, lime, fertilizer, feed, bleach, etc., and help groups synchronize their harvests producing a higher volume of shrimp that can be sold for better prices to the processors via the depot/s acting as contractor/s of outgrowing scheme.
- d) WFC will provide capacity-building to the Pranti PCR lab in Cox's Bazar to produce increased number of White Spot Virus-screened PL. The depot owners will take orders from the leaders of the farmer groups and manage the delivery from hatchery to farm, building into the final delivery price their costs and margin. Farmers need to be convinced that the PL they purchase at a higher price will give them an increased return on their investment.
- e) Technical GHERS staff and extension facilitators will work with and through the group leaders to promote technology among the farmers.
- f) The process for technology development among farmer groups and its expansion will involve the following activities:
 - depot selection for service providers as outgrowers
 - farmer selection for appropriate technology,
 - broad audience awareness campaigns with emphasis on stakeholder consensus,
 - skills transfer through group leaders using group training techniques, one-to-one where appropriate, and training guides already available from WFC,
 - defining the role of other agencies and exploring collaborative opportunities for synergistic development, e.g. Department of Fisheries, NGOs, other farmers groups, and other donor projects.
- g) Improve post-harvest management by ensuring that group members synchronize their harvests and work toward synchronizing harvests between groups for sale to the processors. This will improve product quality, promote traceability and eventual certification, promote international brand image, and above all, increase both farm gate and processor selling prices.
- h) Promote traceability by requiring the participating depots to register the source, date and other relevant information of all their input purchases as well as the source, date and other relevant information regarding the origin of the shrimp produced.

In support of the Ministry of Fisheries' National Action Plan to combat antibiotic contamination in fresh water prawn, PRICE will assist selected *golda* hatcheries to trace and eliminate the use of banned substances and increase the production of clean PL. It may be noted that in the greater Khulna region *bagda* and *golda* are often farmed in an over-lapping seasonal pattern in the same farming sites.

PRICE will also assist *bagda* hatcheries in producing more screened PL; individual firms that opt for more intensive farming methods, and feed mills that are willing to produce commercial feed with traceable inputs.

The other big issue in this subsector is compliance with international standards, primarily those related to food safety and labor conditions. PRICE will continue to collaborate with the Bangladeshi government in strengthening its capacity to do pre-embarkation testing of frozen shrimp, as well as identifying the source of nitrofurans contamination in shrimp and taking measures to combat it. With respect to meeting requirements for labor compliance, the project will continue with its program to diagnose processing plants and train their management and workers on compliance with Bangladeshi labor law.

B4. Interventions for October 2009–December 2010

B4a. Interventions to increase productivity at the farm level

Improved farm management through organized farming. PRICE will work with depot owners under organized farming systems or contract farming to train them on improved/high-density/semi-intensive farming methodologies to increase output. We will support establishment of embedded extension services from depot owners to shrimp and prawn farmers, including the use of screened PL and other high quality inputs, and support for recruiting and training depot extension facilitators. These facilitators will in turn train farmer groups in better farm management practices to significantly increase yields. This will be done under continuation of the GHERS program, subcontracted to the World Fish Center. About 10,000 shrimp farmers working with six to 10 depot owners in the Khulna-Bagerhat area will receive assistance this year, under this initiative. In ensuing years this number will be expanded to reach up to 30,000 farmers by 2013, equivalent to approximately 25% of all shrimp farmers in the Khulna region. This significant proportion of shrimp farmers engaged in good aquaculture practices – including the use of screened PL – is expected to have a significant demonstration effect on other shrimp farmers in the region.

Access to and use of screened PL and other quality inputs. Through the GHERS program PRICE will provide capacity-building to the Pranti PCR lab in Cox's Bazar so that they can produce increasing numbers of screened *bagda* PL. PRICE will also encourage a hatchery in Khulna to transport screened *bagda* naupli (larval stage) from Cox's Bazar to their hatchery in Khulna, in order to significantly increase the availability of screened PL for farmers in the most important growing region of the country. Our partner farms will be assisted in use of laboratory screened PL to avoid white spot virus and other problems.

With respect to *golda*, PRICE will continue assisting Aqua Star Hatchery in Khulna in the traceable production and supply of quality post-larvae to integrated farmers, as well as linking famers to quality grade HPL sources for vertical production. For the supply of better quality feed and appropriate use of feed in cultivation, North Khulna Poultry and Fish Feed Mill and Satkhira Feed Industries, Ltd. in Khulna will be given continued assistance on better feed formulation and on training dealers about providing embedded information services to farmers. The project will make farmers and feed mills aware of the economic value of producing and using proper feed.

Partners: Din Bijoy Enterprise, shrimp depot; Vairob Fish shrimp depot and PL seller; Raju Enterprise, a shrimp contract farming initiative; Mofa Fish Processing Ltd., fish processor; Modina Matshya Prokolpo; Mondal Fish; and Satata Fish, all in Khulna-Bagerhat area. The GHERS project, through the World Fish Center with six depot owners in Khulna-Bagerhat area. Aqua Star Hatcherery in Khulna. North Khulna Poultry and Fish Feed Mill, and Satkhira Feed Industries Ltd. in Khulna. Other partners will be selected during the working period.

B4b. Interventions to improve compliance with international standards

Experiment to detect probable source of nitrofurantoin contamination. PRICE, in collaboration with the Bangladesh Fisheries Research Institute, has designed and is conducting an experiment in Cox's Bazar to detect the probable source of nitrofurantoin contamination in farmed prawns by feeding test animals with feed/ingredients suspected to contain nitrofurantoin. The project will continue this project in FY 2010.

Strengthen Bangladesh's food security testing capabilities. PRICE has offered the Department of Fisheries continuing collaboration to improve the skills of its technicians at FIQC, to bring it closer to achieving international certification. New training and technical assistance may be provided during FY 2010 to achieve this end.

Reduce post-harvest losses by improving post-harvest handling and cold chain management. PRICE plans to design field-based and other post-harvest handling remedies, and to educate farmers and associations to ensure ongoing post-harvest handling vigilance. The project will also design farm-based cold chain management solutions, design ice plant water quality solutions, and educate farmers and associations to ensure ongoing cold chain management vigilance. As a result, awareness about the importance of responsible post-harvest handling and cold chain management will increase and their status will be improved.

Reduce the perception of poor labor compliance. Recent published reports on alleged labor abuses in the shrimp industry have raised concerns in the critical U.S. export market. To offset the potential threat and promote fair labor practices, PRICE will continue working to raise awareness of local labor law among industry stakeholders, including processors and their contractors and employees. The Bangladesh Shrimp and Fish Foundation has been subcontracted for this and has already produced training material, including leaflets and posters. Continuing with the implementation of its subcontract, the Bangladesh Shrimp and Fish Foundation will train 10 processing firms in Khulna, Chittagong, and Cox's Bazar on the correct application of

labor practices under the Bangladesh labor law of 2006. PRICE will discuss progress on this issue with the BFFEA, as well as with the Bangladesh Solidarity Center.

Partners: Department of Fisheries, Bangladesh Fisheries Research Institute, FIQC Dhaka Lab, Bangladesh Frozen Food Exporters Association, Taj Fish Ltd., Sambridhi Bhomuki Matsya O Gobeshona Kendra, Organic Shrimps Export Ltd., Jalalabad Frozen Foods Ltd., Jahanabad Sea Foods Ltd., M. U. Sea Foods Ltd., and Gazi Hatchery, among others.

Strengthen processing plants biosecurity measures, HACCP and value added development PRICE has negotiated with a group of leading processing plants for collaboration to increase biosecurity and HACCP in their installations, in order to improve the quality and image of Bangladesh frozen food abroad. Additionally, technical assistance and training will be provided to produce value added products for export diversification and increased income.

Partners: Mofa Fish Processing Ltd, Organic Shrimps Export Ltd. Jahanabad Sea Foods Ltd., Jalalabad Frozen Foods Ltd., M. U. Sea Foods Ltd. Rupali Sea Foods Ltd., Coastal Sea Foods Ltd., Fish Preservers Ltd., Conception Sea Foods Ltd.

C. Expected results in the Aquaculture Sector in FY 2010

Our goal for the period is to generate 14 million dollars in new sales and approximately 6,000 new jobs. We also hope to help generate \$680,000 in private investment. Around 7,500 farmers will be assisted in improving their technology, 1,200 will receive assistance to improve their management practices, and around 1,200 are expected to get access to credit. 1,000 aquaculture workers will also be trained.

IV. LEATHER PRODUCTS SECTOR

A. Overview and Constraints to Growth

With \$400 million in export earnings, the leather sector ranks fourth as a source of foreign revenue for Bangladesh. The principal raw materials for this sector are cowhides (64 percent) and goatskins (33 percent), which are mainly processed in local tanneries. The annual domestic supply of hides and skins is 200 million sq ft, of which 20 percent is consumed locally and 80 percent is exported to 53 countries in the form of semi-finished leather (75 percent), finished leather (20 percent), and footwear, handbags, accessories and other leather goods (5 percent).

The leather goods industry includes 2,000 to 2,500 SMEs, but a handful of large companies control more than 90 percent of the export market. Most of the enterprises are located in Dhaka, followed by Chittagong. The sector generates direct and indirect employment for about 740,000 people, including a significant number of women, particularly in the footwear and leather goods industries.

The sector experienced an export slump of 17 percent during Bangladesh FY 2009 (July 2008-June 2009), falling from \$463 to \$381 million. However, although crust and finished leather exports fell 37 percent (from \$284 to \$177 million), footwear exports grew 10 percent (\$170 to \$187 million), and bags and other leather goods 90 percent (\$9 to \$17 million). This growth was fueled by increased demand for shoes in the lower- and middle-class market, as a result of the global recession.

Availability of basic raw materials and low labor costs present Bangladesh with comparative advantages over competing countries such as China, India, Pakistan, and Thailand to attract importers to procure leather and its derivative products at competitive prices. Currently, several foreign footwear companies, including Adidas, are setting up manufacturing units in Bangladesh. This will enhance the sector's competitiveness, generate more and better employment for a skilled workforce and create an opportunity to increase exports substantially.

However, the sector is still catering to the low-end export market and to advance, it must move to the next level of productivity and product quality. Among other things, this requires improving the quality of raw hides and skins, which suffer from improper flaying and preservation, especially during Qurbani. The tannery subsector also requires updating, particularly in the finishing section.

On the other hand, leather footwear and goods manufacturing units are growing at a good rate and have the potential to expand, but are limited by an acute shortage of skilled workers and managers. SMEs, in particular, are at a disadvantage in areas such as access to market information, product diversification, access to finance, and compliance with international standards.

B. Progress to Date

PRICE has been supporting workforce development for the sector, in collaboration with the government and private sector manufacturers. This includes a sewing

operators training program in collaboration with the Bureau of Manpower, Employment and Training, and another in collaboration with Apex-Adelchi Footwear. The project also initiated programs to improve the quality of the basic raw material - i.e. leather - at its source. PRICE organized two levels of activities: training professional butchers and assisting them with improved flaying techniques, and training and awareness-building for laymen who engage in flaying during Qurbani about proper flaying techniques, through road shows and distributing leaflets.

PRICE has signed a memorandum of understanding with the Leather Goods and Footwear Manufacturing and Exporters Association of Bangladesh to provide assistance for the sector through its members on developing/enhancing skills of workers, strengthening SMEs as subcontractors for lead firms, and enhancing market links.

C. Strategic Focus

Considering factors such as value chain growth trends, value-addition potential, employment opportunities, and sector players' willingness to invest in their own development, PRICE decided to concentrate on the footwear and leather products industries. These industries are in Dhaka (80 percent) and Chittagong (15 percent).

Given the constraints to development of the sector, the project will concentrate interventions in the following four areas:

Improving the quality of raw hides and skins. The ultimate quality and commercial value of finished leather depends on the quality of raw hides and skins. About 40 to 50 percent of the total supply of these hides and skins come during Eid-ul-Azha, when seasonal flayers using improper techniques create losses of up to 20 percent in the value of the leather. PRICE will continue its training and awareness campaign for flayers who sacrifice cattle during Eid, with the aim of reducing flaying loss and increasing leather quality.

Workforce development. PRICE will partner with industry associations and development partners and institutions such as the SME Foundation, International Labour Organization, Bangladesh College of Leather Technology, and the Bangladesh Leather Service Centre (BLSC), to assist the sector in obtaining an adequate supply of skilled workers and to upgrade the workforce and management through specialized training.

Focused technical assistance and links for SMEs. PRICE, in collaboration with concerned associations, will provide technical support to high-potential SMEs in developing their workforce skills and in learning better business practices. PRICE will also support them in developing/strengthening their contacts with lead firms/buyers and financial institutions/banks to expand their business and access to finance. For that PRICE will work with the Leather Sector Business Promotion Council and with the Export Promotion Bureau, to explore windows of opportunity to support the participation of SMEs in international trade fairs. PRICE will also work with development partners, banks and associations in assisting SMEs to get better access to finance.

Strengthening service providers to the leather goods industry. The project will assist BLSC in developing its capacity to sustainably provide training and testing services for the leather industry. PRICE will also explore ways to strengthen the capacity of other representative industry organizations, such as the Leather Sector Business Promotion Council and the Leather Goods and Footwear Manufacturers and Exporters Association.

D. Interventions for October 2009–December 2010

D1. Interventions to Improve the Quality of Hides and Skins

Flaying campaigns to raise awareness and capacity to do proper flaying. On the basis of the experience and lessons learned from its 2008 flaying campaign, PRICE will plan a new flaying campaign to be conducted during Eid-UI-Azha, in November 2009. This new campaign will make greater emphasis on seasonal/casual flayers and will include training of religious leaders (imams) for disseminating information, along with traditional promotional activities through leaflets, banners, haat-eid gah activities, mobile vans, electronic media, etc.

PRICE will conduct a quantitative and qualitative survey after the November 2009 event by taking a sample of tanneries that can give the first evidence of the impact of the flaying campaign. This survey will later be validated through a workshop.

PRICE will share and discuss the results of the 2008 and 2009 flaying campaigns with stakeholders such as the Leather Sector Business Promotion Council and the leather sector trade associations in order to determine their interest in supporting a third campaign, in November 2010. If the appropriate stakeholders agree and provide resources to support this initiative, PRICE will complement their efforts and will seek also to involve the USAID-funded Leaders of Influence (LOI) program as a way to more formally involve Imams in supporting the program.

D2. Interventions to Improve the Quantity and Quality of the Workforce

Partnership with the industry to train new workers. In the framework of the umbrella memorandum of understanding signed between PRICE and the Leather Goods and Footwear Manufacturing and Exporters Association of Bangladesh, the project will collaborate with several of the association's members in developing and implementing training courses for new workers. Conversations are already underway with Apex Adelchi Footwear Ltd. and Jennys Shoes, which are willing to train large numbers of new workers in their own premises and make them available to other members of the association. About 1,000 new workers should be trained this year, and Leather Goods and Footwear Manufacturing and Exporters Association of Bangladesh will help place the trained workers among its members.

Partnership with the government of Bangladesh and the industry to train new workers. PRICE will continue to participate in the program to train poor women and young adults established with the Bureau of Manpower, Employment and Training, and Apex Adelchi, in the Technical Training Center of Tangail. The program is scheduled to conclude in the last quarter of 2009, after training about 300 sewing operators.

Partnership with local NGOs to train new workers. The project has identified local NGOs interested in developing skilled leather workers from their underprivileged community. PRICE will collaborate with NGOs such as the Bangladesh Association for Social Advancement and the Ahsania Mission on preparing their members on activities from pattern-making to finishing, in footwear and goods manufacturing. We will also promote employment of the trained workers in the industry.

Training for SME supervisors and managers. Facilitate and cost-share skill enhancement training for SME supervisors and managers, in collaboration with BLSC. The focus will be on technical and operational management skills, including inventory management and motivation. An estimated 25 to 50 such supervisors will be trained this year.

Technical training for SME workers. The project will collaborate with selected SMEs on skill enhancement of their technical personnel. An estimated 200 to 300 SME workers may participate in this activity.

D3. Assistance to SMEs

Assistance in SME cluster formation. The project is collaborating with a group of graduates from the Bangladesh College of Leather Technology who have recently started their own businesses. PRICE will assist with organization of the group and will facilitate technical assistance on group procurement, marketing, and access to finance. Similar collaboration is being explored with the Chittagong *Khudro Paduka Shilpo Malik Shomity* association.

Technical assistance for improved productivity. PRICE will design a pilot to upgrade processes for SMEs that will include operational flow, floor layout and machine/tool requirements. Ten to 15 SMEs are expected to participate in this pilot, which can then be disseminated through workshops and seminars.

Linking SMEs to lead firms and markets. The project will help arrange buyer-seller meetings to allow SMEs to display their products and attract new buyers. We will also facilitate trips for SME entrepreneurs/workers/supervisors to large enterprises to see and adopt best practices in terms of production process and management practices. We may also support SMEs in developing product catalogues, brochures and Web sites.

Access to finance. Facilitate training on access to finance for SME entrepreneurs to assist them in learning the loan application process and requirements for obtaining bank loans. The project will also facilitate exposure visits and organize meets between bankers and leather sector SMEs, to promote mutual understanding. In this manner, it is expected that 15 to 20 SMEs will be trained and four or five may obtain bank loans.

D4. Other Interventions to Develop the Leather Sector

Strengthening the Bangladesh Leather Service Centre. PRICE will provide technical assistance to help the BLSC develop its capacity to conduct internationally required chemical and mechanical tests in its laboratory. Through this assistance, it is hoped

that BLSC will be able to offer at least two additional tests to the industry, which will also improve the center's sustainability. The project will continue to collaborate with the BLSC in designing and implementing training courses with the industry and in making its services known to the entire sector.

Sector analysis and coordination with industry players and donors. PRICE will collaborate with the ITC, BLSC and the Market Development Forum to prepare an analysis of the leather sector and organize a large public event where key players from the private and public sectors can discuss the major issues affecting the industry and propose courses of action to facilitate its development.

E. PRICE Leather Sector Partners in FY 2010

Bangladesh Leather Service Center; Bangladesh College of Leather Technology; Leather Sector Business Promotion Council; Leather Goods and Footwear Manufacturers and Exporters Association; Apex Adelchi Footwear Limited; Jenny Shoes; Bureau of Manpower, Employment and Training; Technical Training Center of Tangail; BASA; International Trade Center; *Khudro Paduka Shilpo Malik Shomity* association; Export Promotion Bureau; footwear and leather goods SMEs to be selected.

F. Expected results in the Leather Sector in FY 2010

Our goal for the period is to generate eight million dollars in new sales and approximately 500 new jobs. We also hope to help generate \$500,000 in private investment. Around 150 SMEs will be assisted in improving their technology, 50 will receive assistance to improve their management practices, and around 10 are expected to get access to credit. Two thousand leather sector workers will also be trained.

V. PROJECT MONITORING PLAN

Two types of indicators are used to monitor the impact of PRICE's interventions, as well as the project's contribution to key indicators of the global U.S. Foreign Assistance Framework. *Custom indicators* include impact, outcome, and output indicators of the project objective, project intermediate results, and key results areas to track and report on project impact. *Common indicators* are used to report on PRICE's contribution to the global results of priority program areas of the U.S. Foreign Assistance Framework. PRICE uses five custom indicators and three common indicators.

The custom indicators are:

Total value of sales increased

Justification. Economic activities are largely measured by creation of sales. The aggregation of the increase in total value of gross sales of assisted firms can be attributed to PRICE activities. It is calculated in U.S. dollars and disaggregated by domestic and export sales.

Total number of full-time jobs created

Justification. True poverty reduction means having a decent job, with jobs arising from increases in sales and investment across value chains in response to market demand. Full-time equivalent jobs will be defined as those equal to 260 work-days per year for non-agricultural production and 150 days for agricultural production (given the seasonality associated with agriculture work). Only new jobs will count, calculated by taking the total number of work-days and dividing by 260 or 150, as appropriate. A new job will be attributed to the year in which the job originated.

Total value of investment increased

Justification. Economic activities are largely measured by increased investment. The aggregation of the increase in the total value of investment of assisted firms can be attributed to PRICE activities. Investment will include loan and private equity. It is calculated in U.S. dollars and disaggregated by domestic and export sales.

Number of people participating in USAID workforce development programs

Justification and management utility. This indicator measures the number of individuals who enrolled in U.S. government-funded workforce development programs. It is assumed that increased access to quality programs will result in a more skilled, adaptable workforce. This indicator will measure the number of people participating in U.S. government-funded workforce development programs, including technical and vocational programs and workforce readiness programs.

Percentage of processing firms compliant with local labor laws.

It has been proposed to modify this indicator, as all operating plants are obliged to be compliant with local laws, including labor laws.

The common indicators are:

Number of firms receiving U.S. government assistance to improve management practices

Justification and management utility. Firms improve their productivity, and in turn their competitiveness, by adopting improved management practices. This indicator measures the number of firms that receive U.S. government assistance to improve their management practices (financial management, strategic planning, marketing, etc.).

Number of micro-, small, and medium enterprises receiving U.S. government-supported assistance to access bank loans or private equity

Justification and management utility. Firms improve their productivity, and in turn their competitiveness, by accessing capital and increasing investment in productive assets. This indicator measures the number of micro-, small or medium enterprises that are receiving assistance from U.S. government-supported sources to obtain bank loans or private equity.

Number of firms receiving U.S. government assistance to invest in improved technologies

Justification and management utility. Firms improve their productivity, and in turn their competitiveness, by investing in new technologies. It is the number of micro-, small, and medium enterprises that are receiving U.S. government assistance to invest in improved technologies.

Data Collection and Tools

The M&E system is designed to involve all technical team members and project counterparts in collecting data for baseline and performance. Because technical team members and counterparts have first-hand knowledge of their activities and resulting impact, they help to efficiently collect and verify basic M&E data in their technical areas.

The format for data collection is designed by the PRICE M&E unit, taking suggestions from the technical team. Baseline periods are taken as one year immediately before the impact is expected. Performance of the partners is collected quarterly after the baseline period ends.

Baseline and quarterly performance data are collected in three ways: partner interview, sample survey, and focus group discussion. The first method is suitable for the individual SMEs the project is working with. The approach is to proceed with discussion with the partner enterprise and lead the discussion according to the need for information on performance. The partner might recall the information from memory or might check relevant business records for the information. The M&E unit designs formats for recording the gathered information. The interviews are conducted with assistance from the PRICE technical team, who have contacts with partner enterprises and can easily collect data from them, ensuring its quality.

The second method for data collection, sample survey, is used in some cases when performance data on sales, jobs, and investment are not readily available from the

partners because they do not have an organized way of keeping records on parameters like sales, jobs, or investment. Thus, to collect data from those partners, such as fish farmers' associations with a large number of members (from 60 to 720), sample survey methods are used.

A statistically viable sample size is calculated beforehand, considering the character of the population to be surveyed. Professional survey teams are engaged for data collection after taking detailed briefings on the project and the process of data collection from the PRICE technical and M&E teams. The project M&E unit provides formats for data collection.

The third method, focus group discussion, is conducted only occasionally, to complement data gathered by other methods.

Data Analysis

The collected data are checked by the PRICE technical team and the M&E unit, and then processed and analyzed by the M&E unit. Data from sample surveys are extrapolated to obtain the figure for the whole population. The performance period data are compared with the baseline, and the resulting change is taken as performance. All the partners' performances are summed up for the aggregate performance for each sector. Then the three sectors' performance is added to obtain the project performance.

ANNEX A. CAUSAL MODELS BY SECTOR

Causal Mode – Horticulture Work Plan FY 2009-2010

Crop-Potato					
Constraints	Interventions	Outputs	Outcomes	Impacts	
Poor quality seeds and other inputs of potato	<p>Facilitate production of disease-free seed potato and link entrepreneurs to the sources.</p> <p>a. Provide technical support in design and operation of tissue culture, tissue culture labs engaged in production of disease-free in-vitro potato plantlets.</p> <p>b. Assist in capacity building of lab technicians of six new enterprises engaged in plantlet production in tissue culture lab.</p> <p>c. Support training to field technicians, workforce, and contract farmers in production of tuberlets by maintaining proper isolation to six organizations and storage.</p> <p>d. Facilitate training of workforce and contract farmers for production of high-quality disease-free foundation seeds of eight enterprises/companies from tuberlets.</p> <p>e. Provide field-level technical support in production of disease-free certified seeds.</p> <p>f. Establish link with Seed Certification Agency for proper certification of potato seeds.</p>	Capacity of 3 potato seed companies increased for producing certified and truthfully labeled seeds through strengthened tissue culture laboratories and mastering field production techniques.	<p>5 regional seed companies (3 assisted and 2 copycats) produce truthfully labeled and certified seeds and market their products.</p> <p>-sales from certified and TLS seed potato -USD 500,000</p> <p>-USD 1.0 million worth mini-tuber, plantlets, breeder and foundation seed produced and sold.</p> <p>500 full time jobs created.</p>	Market share for quality seeds increased to more than 5% in the targeted region.	
Use of unbalanced doses of fertilizer by the potato farmers and low soil organic matter.	<p>Facilitate education and support in creating conducive environment in using balanced fertilizers and compost.</p> <p>a. Support in providing training to the potato farmers and demonstrate the use of balanced fertilizers in potato based on-soil testing.</p>	<p>Potato farmers are more educated on fertilizer application doses.</p> <p>Understand the necessity of soil testing and also aware of the</p>	<p>Application of chemical fertilizers is more judicious.</p> <p>Organic fertilizers are increasingly being used in</p>	<p>Sustainable production ensured.</p> <p>Farmer's expenditure on chemical fertilizer decreased by 5%.</p> <p>Cost of production reduced.</p>	

<p>Poor access to quality seeds, other inputs, finance and marketing</p>	<p>b. Promote production and use of organic fertilizer in potato fields. c. Facilitate soil sample test through Soil Resource Development Institute laboratories</p> <p>Promote contract farming system for potato farmers.</p> <p>a. Provide technical support to sponsor entrepreneurs in designing and adopting a suitable system. b. Assist sponsor to train relevant staff and farmers on improved farming practices and rules of contract farming systems. c. Support exposure visit to sponsor entrepreneurs and farmers to get ideas on successful contract farming ventures.</p>	<p>benefit of organic fertilizer. Production and availability of organic fertilizers enhanced.</p> <p>4000 potato farmers are brought under outgrowing schemes. 2 new outgrowing companies developed and their capacity increased. Contract farmers are trained on approaches, improved practices and roles and responsibilities of each party.</p>	<p>potato crop farming. Soil fertility enhanced.</p> <p>Potato farmers have better access to inputs and market linkage. Copy-cats of potato contract farming system started emerging.</p>	<p>Income for the potato farmers increased. Per unit area production increased by more than 25% in the assisted farms. Farmers' income and quality of life improved.</p>
<p>Farmers poor knowledge and skill on modern potato farming practices including disease management</p>	<p>Support in developing knowledge and skill of potato farmers.</p> <p>a. Facilitate quality improvement of potato through hands-on training on production management for farmers and workforce b. Extend farm-level technical support for crop and disease management c. Assist in hands-on training on post-harvest handling for proper grade, size and quality for different markets.</p>	<p>1000 potato farmers trained on modern farming practices including disease management. Farmers are better skilled in potato handling.</p>	<p>Farmers put their knowledge and skill into practice. 1.0 million USD sales from table and processed potato. 250 full time jobs created.</p>	<p>More and more potato farmers were skilled on modern farming practices.</p>
<p>Inadequate value addition</p>	<p>Promote standard post harvest practices and value addition activities e.g. grading, sorting and processing. Support establishment of marketing links with processing industries and exporters</p>	<p>Farmers become aware of responsible post harvest practices. Linkage established with one processing industry</p>	<p>Increasing number of farmers using improved PH practices. Processing farms are linked with the out growers schemes and associations.</p>	<p>Processed potato products available and their demands is increasing. Locally produced crisps and frozen french fries are available in the market. Revenue from sales increased across the sector. Investment is increased, more jobs are created.</p>

Crop : Eggplant

Constraints	Interventions	Outputs	Outcomes	Impacts
Low yield of the locally cultivated varieties due to use of low quality seeds	<p>Promote access to hybrid, high-yielding variety and FSB-resistant variety of eggplant seeds.</p> <p>a. Facilitate production and marketing of quality eggplant seed locally.</p> <p>b. Assist in establishing link with BARI, Agricultural Biotechnology Support Project II, with PRICE-supported farmers for advance trial of FSB-resistance transgenic varieties.</p> <p>c. Support eggplant seed producers with TAs for producing high yielding and hybrid seeds of high quality.</p> <p>d. Assist clusters/associations to train and demonstrate the benefits of using quality seeds.</p>	<p>Farmers identify high yielding local varieties and initiate production</p> <p>Capacity of 3 seed companies increased to produce quality brinjal seeds suitable for both seasons.</p> <p>1000 eggplant seed farmers are trained to produce good quality seed; growth and yield test are made in the field.</p>	<p>Assisted seed companies start producing MV open pollinated and hybrid seeds and market in good packaging following seed law.</p> <p>Other seed companies follow suit.</p> <p>Trained farmers start using improved seeds.</p> <p>Demonstration effect draws more farmers into similar practices (as the trained farmers).</p> <p>Sales from seeds \$150,000 USD. 250 full time jobs.</p>	<p>Productivity increased by more than 50% among the assisted farms.</p> <p>Overall farm level productivity increased by about 5%.</p> <p>Income for the farmers increased by 10%.</p>
Farmers lack in knowledge and farming skill	<p>Facilitate in improving seedling raising technology.</p> <p>a. Support training to farmers and seedling-raisers on grafting techniques, sourcing wild eggplant seeds for raising seedlings, etc.</p> <p>b. Establish demonstrations of grafted eggplant with associated technologies.</p> <p>Facilitate training for the eggplant farmers on modern production techniques.</p>	<p>Farmers and nurserymen are trained on grafting and seedling raising.</p> <p>Farmers were exposed to the grafting technologies and appreciate its effect.</p> <p>1000 eggplant farmers are trained on modern production techniques.</p>	<p>Farmers in increasing number are using grafted/ well raised seedling.</p> <p>Good quality seedlings are raised and transplanted in increased number.</p> <p>Increasing number of farmers are following improved cultivation methods.</p> <p>Sales \$500, 000 USD.</p> <p>1200 new jobs created.</p>	<p>Plants and fruits are less susceptible to pests. Productivity increased. Income for eggplant farmers increased.</p> <p>Productivity of assisted eggplant farmers increased by 15%. Income increased significantly.</p>
High loss of brinjal crop due to insect and diseases	<p>Assist eggplants farmers on pest identification and adopt rational control measures.</p>	<p>1500 eggplant farmers trained on pest identification and control measures following</p>	<p>Increasing number of farmers will be able to identify harmful pests and adopt control</p>	<p>Pests are controlled at the economic threshold level</p>

	<p>a. Promote community plant health clinic.</p> <p>b. Facilitate in organized eggplant farming with IPM control approach.</p> <p>c. Demonstration established with integrated pest management approaches in brinjal fields.</p>	<p>environment friendly and economic control approaches.</p> <p>5 community plant clinic initiatives undertaken.</p> <p>Eggplant farmers organized and integrated.</p> <p>Awareness on integrated pest management approach created.</p>	<p>measures.</p> <p>5 community plant clinics are established and farmers start to understand the need of clinic.</p> <p>Eggplant farmers associations are in operation and pest management approaches are taken collectively.</p>	<p>Plant health clinics are in operation to provide regular services to the eggplant farmers.</p> <p>Eggplant farmers associations are running efficiently in managing integrated pest management approach resulting in minimum crop loss.</p>
<p>High frequency of application of a mix of pesticides in eggplant poses threat to human health, ecosystem and high cost of production.</p>	<p>Minimize use of pesticide and support farmers to adopt alternative biological control measure.</p> <p>a. Facilitate link with bio-control agent supplier targeting safe eggplant production</p> <p>b. Support farmer training on use of bio-control agents and other associated environmentally friendly approaches for pest control</p> <p>c. Facilitate block demonstrations with bio-control agents and other associated approaches, followed by field day</p> <p>d. Collaborate with IPM CRSP on eggplant package technology for delivering to farmers for adoption in increasing productivity and lowering cost</p> <p>e. Promoting a market for safe eggplant through link with exporters and local wholesalers, super-shops</p>	<p>2000 Eggplant farmers are aware and knowledgeable on biological pest control.</p> <p>Mature technologies of IPM CRSP for egg plant production are made available to PRICE-assisted farmers through collaborative action.</p>	<p>Farmers are using biological pest control measure for eggplant crop protection.</p>	<p>Higher numbers of farmers have adopted biological pest control approach by producing increased quantity of safe brinjal minimizing health hazard and pollution and minimizing cost of production.</p> <p>Safe eggplants are made available in the market.</p>
Crop : Mango				
Constraints	Interventions	Outputs	Outcomes	Impacts
<p>Poor crop management leading to low productivity</p>	<p>Support efforts to improve existing crop management practices.</p> <p>a. Facilitate improving knowledge and skill of</p>	<p>500 mango farmers trained on crop production management.</p>	<p>Mango farmers have started to practice improved crop management practices.</p>	<p>Farmers in increased number are practicing improved crop management practices, resulting in increased yield and enhanced</p>

	<p>farmers in production and protection.</p> <p>b. Organize training for mango growers on pre-production, orchard management and prophylactic measures.</p> <p>c. Provide technical support to farmers during production period.</p>			<p>\$250,000 USD sales from Mango earned.</p> <p>200 full time jobs created.</p>	income
Declining yield due to old age of orchard	<p>Establishment of demonstration on rejuvenation of old orchards.</p> <p>a. Provide hands-on training on rejuvenation and orchard establishment.</p> <p>New plantation initiative supported through adoption of creating awareness among nurserymen in producing elite planting materials.</p> <p>a. Promote production of elite planting material from mother orchard through technical skill training.</p> <p>b. Create awareness among farmers about the right planting material.</p>	<p>Farmers are aware of importance of rejuvenation in old mango plants</p> <p>Nurserymen are trained on producing elite planting material.</p> <p>Farmers are aware of using better planting material.</p>	<p>Rejuvenation process initiated among the trained farmers and demo neighborhoods.</p> <p>Elite planting materials are produced for planting.</p>	<p>Increasing number of old orchards are rejuvenated, paving the way for increased productivity and income.</p> <p>New orchards are established with elite planting materials</p>	
Improper pest management	<p>Facilitate training and demonstrations on year round proper pest management practices.</p>	<p>A mango post management manual is developed.</p> <p>A calendar for year round pest management is in place.</p> <p>Mango farmers of one association start practicing the improved method.</p>	<p>Increasing number of mango orchards brought under new pest management approach</p> <p>Productivity of orchards, practicing improved pest management increased by 20-25%.</p>	<p>Sector productivity increased by around 5%. Income of the mango producers enhanced.</p>	

Poor post harvest handling practices	Support training to the farmers and traders on proper post harvest handling Facilitate demonstration on hot water treatment by using hot water treatment plant and proper ripening. Demonstrate use of proper packaging and containers.	Association farmers are trained on post harvest handling practices. Farmers are aware of importance of hot water treatment for longer shelf life; proper ripening technology is known to farmers. Farmers are aware of using proper packaging material and containers.	Mango farmers adopt responsible post harvest handling and adopt use of hot water treatment plant.	Post harvest losses reduced by 5%.
Inefficient and long marketing channel	Facilitate contract farming/marketing initiative. Promote more efficient market links	Sponsor contractor /marketing company emerged and started operating	Marketing channels shortened and increasing numbers of farmers are brought under new marketing scheme. \$80,000 USD sales. 150 new full time jobs created.	Farmers get better price for their products. Income enhanced across the chain.

Cross Cutting Issues

Constraint	Interventions	Outputs	Outcomes	Impacts
Horticulture farmers lack access to quality compost and other organic fertilizer.	Promote production and marketing of quality organic fertilizer. Facilitate technical training and demo on organic fertilizer.	Farmer's access to organic fertilizer improved. 1000 Farmers trained on use of organic fertilizers.	Increasing number of farmers are using organic fertilizers in right quantity. Sales of year round horticultural crops increased by \$500,000 USD. Sales of organic fertilizer \$100,000 USD. 250 full time jobs created.	Sustainable productivity is visible and soil health is improved.
Poor access to post harvest handling	Piloting field pack station to demonstrate post harvest loss reduction	Establishment of a pilot assembly center.	Horticulture Farmers' start using the center; become aware of the post harvest handling and simple value	Copy cats of facilities emerged. Farmers use it as standard practices; quality of horticulture products enhances; post harvest

<p>Poor knowledge in selection, use and application of pesticide application and other compliance requirement of the international buyers</p>	<p>Promote Safe horticultural produces at the field and factory :</p> <p>a. Facilitate farmers' training to promote GAP, IPM and biological pest management</p> <p>b. Support training of work force, vendors, and horticultural processors on food quality, safety, and compliance</p>	<p>1000 trained farmers, aware of the GAP, IPM and the benefits of using these.</p> <p>100 workforce, vendors and processors benefitted on learning on HACCP and other compliance requirement.</p>	<p>addition techniques and the benefit.</p> <p>Trained Horticulture farmers start using GAP, IPM techniques and reap the benefits.</p> <p>\$500,000 USD in sales from safe vegetables.</p> <p>Workforce using HACCP guidelines in the processing plants.</p>	<p>losses reduced.</p> <p>Demonstration effect draws new farmers to GAP, IPM.</p> <p>Product quality improved. Farmers receive better prices.</p> <p>Safety compliance enhanced.</p>
<p>Inadequate access to international market and lack of understanding on requirement of export market.</p>	<p>Establish linkage with horticulture producers and processors to international market.</p> <p>Promote Bangladeshi products — processed and fresh — through participation in fairs and exhibitions.</p>	<p>Bangladeshi processors and exporters are more informed about international market requirement.</p>	<p>Access to international market for Bangladeshi produces improved.</p> <p>\$380,000 USD from local market and export of processed veg. products.</p> <p>20 full time new jobs created.</p>	<p>Bangladeshi produces entered into new market following buyers' requirements.</p>
<p>Limited access to Finance</p>	<p>Facilitate increased access to finance</p> <p>a. Increase number of outgrower schemes from three to five to increase the provision for value chain financing.</p> <p>b. Engage with microfinance organization to develop horticulture sector-specific loan product.</p>	<p>Number of out grower schemes increased to 5 in potato and mango</p> <p>2 microfinance organization developed potato and mango crop based loan product.</p> <p>An efficient market information system in place.</p>	<p>Increased numbers of farmers are having access to finance.</p>	<p>Access to finance to project targeted farmers is ensured and many other agricultural activity supported financing agencies are offering new product for horticultural farmers.</p>
<p>Poor access to market information for farmers/MSMEs</p>	<p>Support improvement of existing market information system.</p> <p>Analyze the existing systems and support interventions to make it more efficient and effective.</p>	<p>Farmers' (and other value chain actors) access to market information improved.</p>	<p>Farmers' access to market enhanced. They receive better prices for their produce.</p> <p>Income enhanced.</p>	<p>Farmers' access to market enhanced. They receive better prices for their produce.</p> <p>Income enhanced.</p>

**Causal Mode – Fish Subsector
Work Plan FY 2009-2010**

Sub-Sector-Fish				
Constraint	Interventions	Outputs	Outcomes	Impacts
Poor quality seeds due to inbreeding and poor quality feed due to farmers' lack of knowledge reduces farm yields.	<p>Increasing farmers access to inbreed-free seeds and better inputs:</p> <ul style="list-style-type: none"> a. Support the hatcheries and a fish-seed traders' association for enhancing the supply of inbreed-free fry and fingerlings for the producers' association. b. Assist a feed mill in order to facilitate the easier access to quality feed for the producers and association members. c. Support the training to association members on group procurement of inputs. 	<p>PRICE supported hatcheries have access to inbreed-free broods. Association farmers become aware of the benefits of using standard feed.</p>	<p>Supply of inbreed-free fries and fingerlings increased. More farmers start stocking quality seeds and using standard feed.</p> <p>Sales increase: \$1.2 million</p> <p>Jobs increase: 300 Full time equivalent (FTE)</p>	<p>Productivity increased significantly. Production and revenue from sales enhanced resulting new jobs and increased income for the farmers.</p> <p>Investment increase: \$40,000</p>
Insufficient farming knowledge, lack of modern aquaculture techniques and skills leads mostly	<p>Promoting Improved Farming practices.</p> <ul style="list-style-type: none"> a. Train members of partner associations on improved fish farming 	<p>Some 10,000 farmers become trained on improved/ high density /semi -intensive aqua farming techniques</p>	<p>Farmers put their knowledge into practice, Productivity increases by 25% for the trained farmers of partner associations.</p>	<p>Income for the aqua farmers increased , Investment: \$180,000</p>

<p>to following traditional methods of farming And low production</p>	<p>techniques. Roughly 10,000 fish farmers through 12 associations will be assisted on improved/high density/semi-intensive farming methodologies to increase production from present state of yield.</p>		<p>Sales: \$2.4 Million Jobs: 1200 FTE</p>	
<p>Lack of farming integration under diverse agro-ecological conditions/zones for round the year cropping and seasonal farming yields comparatively less than potential</p>	<p>Promote integrated farming for round the year production:</p> <ol style="list-style-type: none"> a. Assist training on integrated aqua-farming and diverse aquatic crop production b. Promote crop-rotational fish culture and horticultural crop farming on pond embankments. 	<p>Association members are trained on techniques for optimum use of water bodies, especially round the year fish farming practices.</p>	<p>Practice for efficient and effective utilization of water bodies; especially round the year farming starts adding new dimension in the productivity of the water bodies owned by the association members. Sales: \$500,000 Jobs: 300 FTE</p>	<p>Production increased. Income for the community-based farmers enhanced. Investment: \$40,000</p>
<p>Diseconomies of scale in case of procurement and marketing (fish farming in Bangladesh is done in small fragments by small farmers who have lack of access to good inputs)</p>	<p>Improve farmers' backward linkage in the domestic market:</p> <ol style="list-style-type: none"> a. Assist associations/cooperatives to train members on techniques and benefits of group procurement of inputs. 	<p>Partner association members become aware of the benefit of group procurement. 10% members start practicing group procurement.</p>	<p>Association members get the benefits of scale. Group procurement creates access to quality inputs for micro and small enterprises in cost effective manner. Demonstration effect draws more farmers</p>	<p>Productivity enhanced, and investment enhanced for the smallholder farmers; new jobs created. Investment: \$20,000</p>

<p>Inadequate access to export market for traditional value added fish products.</p> <p>Low export for non-traditional fish products</p>	<p>Improve farmers' forward linkage in the domestic market:</p> <ul style="list-style-type: none"> b. Assist associations/cooperatives to train members on group marketing of fish. c. Organize workshops to link the farmers' associations to the wholesalers and supermarkets and exporters. 	<p>4000 smallholder fish farmers are trained on group marketing. 12 linkage workshops held (for linking the association based smallholder farmers with the wholesalers)</p>	<p>to adopt group farming techniques Sales: \$400,000 Jobs: 500 FTE</p> <p>Farmers are better linked with the forward market. Increased option and economies of scale enhances their bargaining power. Sales: \$400,000 Jobs: 400 FTE</p>	<p>Better price for the fish produce. Revenue and income enhanced. Investment: \$20,000</p>
<p>Inadequate access to export market for traditional value added fish products.</p>	<p>Promoting hygienic production and marketing of dry fish:</p> <ul style="list-style-type: none"> a. Support fish dryers' association with TAs for producing hygienic dry fish. b. Support members on packaging, storing and transportation c. Link the reputable buyers with the dry fish exporters associations. 	<p>Association members are trained and equipped with the knowledge and skill for producing quality dry fish. Producer buyers' linkage established.</p>	<p>Dry fish export increased significantly. Sales: \$2.8 Million Jobs: 300 FTE</p>	<p>Investment, sales and income increased, especially for the dry-fish producers Investment: \$80,000</p>
<p>Inadequate access to export market for traditional value-</p>	<p>Promoting hygienic production and marketing of dry fish:</p> <ul style="list-style-type: none"> a. Support fish dryers' 	<p>Association members are trained and equipped with the knowledge and skill for</p>	<p>Dry fish export increased significantly.</p>	<p>Investment, sales and Income increased, especially for the dry-fish producers</p>

<p>added fish products.</p>	<p>association with TAs for producing hygienic dry fish. b. Link the reputable buyers with the dry fish exporters associations.</p>	<p>producing quality dry fish. Producer buyers' linkage established.</p>	<p>Sales: \$2.8 Million Jobs: 300 FTE</p>	<p>Investment: \$80,000</p>
<p>Poor access to finance limits growth.</p>	<p>Assist access to institutional credit: a. Assist linking enterprises and financial institutions ; b. Support the entrepreneurs in preparing business plans; c. Facilitate entrepreneurs' liaison with the banks to get loans against the guarantee of the association as a whole.</p>	<p>At least six fish farm associations or cooperatives are assisted to participate in linkage building events with the FIs. Aqua farmers (mainly the association members) are more knowledgeable on the requirements of financing institutions. They are also better linked with the FIs.</p>	<p>More aqua-farmers enjoy access to bank loans. Sales: \$300,000 Investment: \$100,000</p>	<p>Investment for aqua farmers enhanced. Productivity and sales increased. New jobs are created. All this means more income for the farmers. Jobs: 100 FTE</p>

**Causal Mode – Shrimp Subsector
Work Plan FY 2009-2010**

Constraint	Interventions	Outputs	Outcomes	Impacts
Farmers inadequate access to screened Bagda PL	<p>Promote PCR testing and stocking of screened PL</p> <ol style="list-style-type: none"> Assist strengthening capacity of PCR lab Support popularization of screened PL among GHERE farmers Demonstrate better performances of screened PL 	Farmers become aware of the benefit of using screened PL	<p>Increased use of screened PL leads to increased productivity</p> <p>Increased Sales: \$300,000.</p> <p>Increased jobs: 100 FTE (Full time equivalent)</p>	<p>A sustainable and growing market for screened PL leads to increased production, revenue and investment in the sector</p> <p>Investments: \$10,000</p>
Integrated farmers' inadequate access to quality grade golda HPL	<p>Support linkages to golda hatcheries producing quality grade HPL</p> <ol style="list-style-type: none"> Assist in training the golda PL traders/ nurseries Assist to make linkage with quality HPL sources. 	Integrated bagda farmers' have increased access to quality golda HPL as well	<p>More farmers have access to quality grade golda HPL.</p> <p>Integrated farming with crop-rotational bagda/golda/fish increased at a faster rate.</p> <p>Increased Sales: \$200,000</p> <p>Increased jobs: 100 FTE</p>	<p>Vertical increases in diverse biomass production for export and domestic consumption.</p> <p>Income for the aqua farmers increased.</p> <p>Investments: \$15,000</p>
Farmers' lack of knowledge and skill for adopting improved	<p>Promote contract farming system:</p> <ol style="list-style-type: none"> Support contractor designing an efficient 	10, 000 shrimp farmers are brought under outgrowing schemes.	<p>Productivity of contract farmers increased by 20%,</p> <p>The schemes serve as</p>	<p>Copy cats emerged.</p> <p>Sector competitiveness increased</p> <p>Revenue from sales</p>

<p>farming practices</p> <p>Lack of traceability</p>	<p>system;</p> <p>b. Assist in training the entrepreneur, staff and the contract farmers</p>		<p>the building blocks of an efficient traceability system</p> <p>Increased Sales: \$3 million</p> <p>Increased jobs: 1800 FTE</p>	<p>enhanced, Income enhanced.</p> <p>Investments: \$95,000</p>
<p>Lack of farming integration under diverse agro-ecological conditions/zones for round the year cropping and seasonal farming yields comparatively less than potential</p>	<p>Promote integrated farming methods:</p> <p>a. Promote crop-rotational golda and bagda farming on seasonal basis</p> <p>b. Support integrated golda/bagda farming with fish and vegetables</p>	<p>Awareness on the benefit of integrated farming created.</p>	<p>Practice for efficient and effective utilization of water bodies; especially round the year farming started, adding new dimension in the productivity for the farmers in costal belts.</p> <p>Increased Sales: \$500,000</p> <p>Increased jobs: 300 FTE</p>	<p>Production increased in sustainable manner. Income for the farmers enhanced considerably.</p> <p>Investments: \$15,000</p>
<p>Presence of nitrofuran and other banned substances in farmed prawn</p>	<p>Capacity build-up of public research and testing facilities:</p> <p>a. Experiment to find out probable sources of nitrofuran metabolites.</p> <p>b. Experiment to find out probable removal of nitrofuran metabolites from contaminate prawn.</p> <p>c. LC-MS testing of farmed</p>	<p>Capacity of the research and testing facilities enhanced</p>	<p>Research institute capacity build-up on finding banned substances in aqua animals The Lab accreditation obtained. Sample from consignments are tested more effectively</p>	<p>Entry of banned substances in farmed aquatic animal declined. Removal process of metabolites from contaminated animals discovered. Rejection reduced significantly. Export enhanced. Higher level of sector competitiveness achieved. Sales and</p>

<p>Negative perception of buyers on compliance of local labor law 2006</p>	<p>samples</p> <p>Promoting compliance of labor law for the shrimp processing plants:</p> <ul style="list-style-type: none"> a. Supporting dissemination of the key provisions of 2006 labor law among the workers and managers of shrimp processing plants. b. Facilitating visits of USTR and key buyers to shrimp processing plants. 	<p>Value chain actors become more educated on labor law provisions and rights</p> <p>Buyers are aware of latest status of labor practices</p>	<p>Increased Sales: \$700,000</p> <p>Processing plants and the whole value chain are more compliant.</p> <p>USTR and Buyers' perception of labor practices is based on realistic ground.</p> <p>Increased Sales: \$300,000</p>	<p>income increased across the sector</p> <p>Access to international buyers enhanced. Processors, depot owners and farmers get better prices for their produces.</p>
<p>Inadequate biosecurity and HACCP compliance in processing plants</p>	<p>Facilitating improved biosecurity and HACCP measures among management and workers of processing plants:</p> <ul style="list-style-type: none"> a. Assist training to processing staff/workers about HACCP and biosecurity b. Assist management training to senior staffs/owners 	<p>All associated with processing and handling of raw materials aware of biosecurity & HACCP</p>	<p>Processing plants and exporters are more compliant on biosecurity & HACCP</p> <p>Increased Sales: \$500,000</p> <p>Increased jobs: 500 FTE</p>	<p>Rejection reduced significantly. Export enhanced</p> <p>Investments: \$25,000</p>
<p>Lack of adequate Value Added Product (VAP) in shrimp export</p>	<p>Promote VAP development in shrimp processing plants</p> <ul style="list-style-type: none"> a. Assist training to processing staff on VAP and product development b. Assist linkage with potential buyers 	<p>Awareness on diverse VAP created</p>	<p>Preparation and search for market for VAP increased</p> <p>Increased Sales: \$500,000</p> <p>Increased jobs: 200 FTE</p>	<p>Effort to penetration in new markets with new products enhanced</p> <p>Investments: \$40,000</p>

**Causal Model – Leather
Work Plan FY 2009-2010**

Constraints	Interventions	Outputs	Outcomes	Impacts
Lack of consciousness of the flayers/cattle purchasers during Qurbani on economic prospect of hides/skins leads to loss of revenues of the sector	Flaying campaigns to raise awareness and increase capacity of butchers/flayers to do proper flaying and preservation	Awareness created among the flayers and people sacrificing animals on the benefit of proper flaying and basic preservation practices.	Butchers/people sacrificing animals, giving more attentions for proper flaying and preservation of hides/skins.	Quality of hide/skins improved in terms of cleanliness
Lack of skilled workforce leads to low productivity and poor product quality	<p>Training for workers and supervisors/mid level managers for footwear/goods sector</p> <ul style="list-style-type: none"> • Training new workers in partnership with industry associations • Training new workers in partnership with associations and the government • Training new workers in partnership with local NGOs • Training SME supervisors/managers • Enhancing skills of SME-workers 	Additional 1000 workers are trained for footwear/ goods sector.	New jobs created for additional 1000 skilled workers. Productivity and quality of footwear and leather goods enhanced	Sales increased for the additional production done by 1000 new workers ~ US\$ 4.5 million
Poor access to business service leads to low competitiveness of the sector	<p>Building capacity for service providers (strengthening BLSC lab)</p> <ul style="list-style-type: none"> • Strengthening Bangladesh Leather Service Centre, BLSC, by developing their institutional 	10 lab technicians of BLSC and BCLET are trained; Capacity of the BLSC lab increased; additional testing	Entrepreneurs have access to more and better testing services such as testing formaldehyde	BLSC lab can make new offer of testing, ~250 BCLET students will learn practical knowledge of these

	<p>capacity for conducting various chemical/ mechanical tests in their lab.</p> <ul style="list-style-type: none"> • Collaborating with development partner such as ITC in organizing partnering cooperation events • Collaborating with development partner ITC to facilitate a sector analysis to be used in above event 	<p>facilities are in place</p>	<p>and Cr-6 in leather/ products. More entrepreneurs take the services of the lab.</p>	<p>testing from the lab, BLS lab can earn additional ~ \$ 7000 annually from these tests.</p>
<p>Inefficient production process makes SMEs less competitive</p>	<p>Supporting job simplification and up gradation of SME production process</p> <ul style="list-style-type: none"> • Assisting SMEs on process up gradation i.e. improving operational flow, machine/tools requirements etc. 	<p>100 personnel from 10 SMEs are trained in better production processes and become more efficient</p>	<p>Entrepreneurs implement efficient and cost effective system</p>	<p>Cost of production of assisted firms reduced by at least 1%; Enterprises get competitive edge in market; income enhanced.</p>
	<p>Facilitating exposure trips for SMEs to adopt better business practices</p> <ul style="list-style-type: none"> • Facilitating exposure trips for SME entrepreneurs /workers /supervisors to large enterprises (local/regional) to see and adopt best practices 	<p>SMEs have better access to market information regarding new buyers, materials and designs etc.; base for better interfirm</p>	<p>More product diversification; increased queries from the buyers; more sub contracting agreement executed</p>	<p>Income increased for SMEs Sector competitiveness enhanced</p>
<p>Limited access/ exposure to market information/ market leads to poor business growth for SMEs</p>	<p>Increasing access to buyers/ market through facilitating buyers-sellers meet</p> <ul style="list-style-type: none"> • Linking SMEs to lead firms and market by facilitating buyer-seller meets, product, etc. 			

<p>Limited access to finance leads to poor expansion of SME business</p>		<p>cooperation established</p>	<p>Additional sales ~ \$2.5 million for assisted SMEs.</p>
<p>Training SMEs on banking requirements, facilitating linkage workshops between bankers and SME entrepreneurs</p> <ul style="list-style-type: none"> • Training SME entrepreneurs on bank loan application process and other financial requirements • Facilitating exposure visits for bankers to SME cluster/industries to have better understanding on the leather business risks/opportunities • Facilitating workshops to bring both banks and SMEs for better mutual benefits 	<p>Entrepreneurs become aware of loan application requirements; preliminary linkage between the banks and entrepreneurs are established</p>	<p>15-20 SMEs will be trained and 04-05 ready to take loans to address the additional sales opportunities created due to sub contracting; new jobs created.</p>	

ANNEX B. GANTT CHARTS BY SECTOR

HORTICULTURE

Description of Activities	Q1	Q2	Q3	Q4	Q5	Partners/Responsibility
1. Potato						
1.1. Facilitate production of good-quality seed to increase availability						
a. Provide technical support in design and operation of tissue culture; tissue culture labs engaged in production of disease-free in-vitro potato plantlets						Metal Agro, Rural Development Academy, Giant Agro
b. Assist in capacity building of lab technicians of six new enterprises engaged in plantlet production in tissue culture lab						Rural Development Academy and other partners
c. Support training to field technicians, workforce, and contract farmers in production of tuberlets by maintaining proper isolation to six organizations and storage						Giant, Metal Agro, Rural Development Academy, Firdausi Biotech, and others
d. Facilitate training of workforce and contract farmers for production of high-quality disease-free foundation seeds of eight enterprises/companies from tuberlets						GUKED, Mural Cooperative Society (MRDMCSL), Dynamic Agro, Rangpur Dinajpur Rural Services, Modern Seed, Unique Seed
e. Provide field-level technical support in production of disease-free certified seeds						MRDMCSL, GUKED, Unique, Modern, Dynamic
f. Establish link with Seed Certification Agency for proper certification of potato seeds						Dynamic, Konika, Modern, GUKED, and others
1.2. Promote potato contract farming						
a. Continue support to two partners to reach 1,850 farmers and explore possibility of supporting five more partners, bringing the total supported farmers to 4,000 in contract farming, and provide technical assistance						GUKED, MRDCSL, and other interested potential partners, technical service providers
b. Support exposure visit to sponsor entrepreneurs and farmers to get ideas on successful contract farming ventures						Representatives from partners
1.3. Support in developing knowledge and skill of potato farmers						
a. Facilitate quality improvement of potato through hands-on training on production management for farmers and workforce						GUKED, MRDMCSL, and other associations
b. Extend farm-level technical support for crop and disease management						

Description of Activities	Q1	Q2	Q3	Q4	Q5	Partners/Responsibility
c. Assist in hands-on training on post-harvest handling for proper grade, size, and quality for different markets						
1.4. Promote use of balanced fertilizer and organic composts by facilitating link with PRICE-supported supply source						Associations, contract farmers, out-growing companies
a. Train farmers on use and application of proper doses of fertilizer, based on soil nutrient level						Associations and others
b. Facilitate soil sample test through Soil Resource Development Institute laboratories						Soil Resource Development Institute, farmers, out-growing companies
1.5. Support establishment of marketing links with processing industries and exporters						Golden Harvest, Bangladesh Frozen Vegetables Exporters Association, exporters, processors
2. Eggplant						
2.1. Promote access to hybrid, high-yielding variety and FSB-resistant variety of eggplant seeds by farmers						BARI, Agricultural Biotechnology Support Project II, seed firms, farmers' associations
a. Assist in establishing link with BARI, Agricultural Biotechnology Support Project II, with PRICE-supported farmers for advance trial of FSB-resistance transgenic varieties						Agricultural Advisory Society (AAS), VAKUBS, and others
2.2. Facilitate improving seedling-raising technology (grafting) and increase access to resistant planting material						BARI, VAKUBS, AAS, Environmentally Friendly Agricultural Development Foundation, Organix, USAID Integrated Pest Management Collaborative Research Support Program (IPM CRSP)
a. Support training to farmers and seedling-raisers on grafting techniques, sourcing wild eggplant seeds for raising seedlings, etc.						Farmers' associations, AAS, Vakubs, GUKED, BARI-IPM CRSP, Environmentally Friendly Agricultural Development Foundation
b. Establish demonstrations of grafted eggplant with associated technologies						AAS, farmers' associations
2.3. Promote access to organic and inorganic good-quality fertilizer, encourage use						GKSSE, Ryja Fertilizers, and other partners, EFADF
2.4. Facilitate link with bio-control agent supplier targeting safe eggplant production						Producing company, associations
a. Support farmer training on use of bio-control agents and other associated environmentally friendly approaches for pest control						Farmers' associations, BARI, Isphani

Description of Activities	Q1	Q2	Q3	Q4	Q5	Partners/Responsibility
b. Facilitate block demonstrations with bio-control agents and other associated approaches, followed by field day						AAS, Vakubs, GUKED, Organix, AID-agro, Mart
c. Collaborate with IPM CRSP on eggplant package technology for delivering to farmers for adoption in increasing productivity and lowering cost						IPM CRSP and associations
2.5. Promoting a market for safe eggplant through link with exporters and local wholesalers, super-shops						AAS, wholesalers, exporters' association, out-growers
3. Mango						
3.1. Assist associations and stakeholders in introducing improved farming techniques						Kansat cooperative mango farmers' association
a. Facilitate improving knowledge and skill of farmers in production and protection						Kansat cooperative mango farmers' association and other farmers
b. Organize training for mango growers on pre-production orchard management and prophylactic measures						Kansat cooperative mango farmers' association, Mango Research Institute
c. Provide technical support to farmers during production period						Kansat cooperative mango farmers' association
3.2. Promote production of elite planting material from mother orchard through technical skill training						Nurserymen, farmers
a. Create awareness among farmers about the right planting material						Mango farmers
3.3. Facilitate rejuvenation, replacement of old, and expansion of new garden						Farmers' associations, service provider
a. Provide hands-on training on rejuvenation and orchard establishment						Consultant, Mango Research Institute
3.4. Create awareness and support in adopting appropriate pest control measures in time, rationalize use of pesticides						Farmers, consultant, Mango Research Institute
a. Facilitate in result and method demonstrations on rational pest control measures						Association, mango research
b. Train farmers, work force on pest identification, appropriate pesticides, and proper application method and interval						Farmers, workforce, associations
3.5. Facilitate adopting proper pre- and post-harvest handling, particularly hot water treatment, use of proper packaging and containers						Farmers and middlemen, Aratdars (wholesalers)
3.6. Promote more efficient market links						Farmers' association, Aratdars
4. Crosscutting Issues						
4.1. Promoting production and use of compost for vegetable production						

Description of Activities		Q1	Q2	Q3	Q4	Q5	Partners/Responsibility
	a. Provide technical assistance to six bio-fertilizer manufacturers						GKSSE, Ryia, and other partners, service provider
	b. Promote a market for compost for horticultural producers						GKSSE, Ryia, and other partners, consultant
	c. Link farmers with quality bio-fertilizer suppliers; organize training for farmers, dealers, and retailers on importance of environmentally friendly good quality bio-fertilizer, effect on yield and profitability						Associations, cooperatives
	d. Establish demonstration with organic fertilizer to promote use and application of bio-fertilizer						GKSSE, Ryia, and other partners
4.2. Linking horticulture producers and processors to internationals market							
	a. Promote Bangladeshi products — processed and fresh — through participation in fairs and exhibitions						Gulfood Fair, U.K. Food and Drink Expo, and others
	b. Establish buyer and seller meetings						Gulfood, U.K. Food and Drink Expo
4.3. Piloting field pack station to demonstrate post-harvest losses							
	a. Create awareness on importance of better harvesting and post-harvest handling at different levels through focus group discussion and meetings with growers and traders						Out-growing schemes, associations, traders, exporters, wholesalers
	b. Undertake feasibility study and pilot horticultural product assembling center in collaboration with farmers' associations/groups for possible replication						Subcontract
4.4. Promoting safe horticultural produces at the field and factory							
	a. Facilitate a campaign on safe use of pesticides and plant protection measures in collaboration with input selling companies, superstore, exporters, and NGOs						Syngenta, Ryia, GKSSE, exporters, NGOs
	b. Promote biological pest control method						EFDFAF, ORGANIX, AAS VAKUBS service providers
	c. Design and develop Bangladesh standard good agricultural practices consistent with international practices, in collaboration with associations and exporters						FDA/consultancy
	d. Train farmers, service providers on adoption of good agricultural practices, in collaboration with interested organizations						Service providers
	e. Train work force, vendors, and horticultural processors on food quality, safety, and compliance						Golden Harvest Agro, consultant
4.5. Market information dissemination							

Description of Activities	Q1	Q2	Q3	Q4	Q5	Partners/Responsibility
a. Undertake a study on existing market information delivery situation and weaknesses, and based on that, design and develop information-dissemination model						Subcontract
4.6. Facilitate increased access to finance						
a. Enhance access to value chain finance						
b. Increase number of out-grower schemes from three to five to increase the provision for value chain financing						Out-grower enterprise
c. Engage with microfinance organization to develop horticulture sector-specific loan product						GUK,AID, GKSS, PATHIKRIT, and other NGOs

FISH

Activity in Detail	1 st Quarter*	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
1. Productivity						
1.1. Promote production and use of inbreed-free seeds						Partner hatcheries as service provider
1.1.1. Identifying hatcheries produce inbreed-free seeds						Survey conducted in selected hatchery zone by hired consultant
1.1.2. Access to high-quality fish seeds						Group farmer linked to nurseries, hatcheries, seed traders by in-house counseling
1.1.3. Access to inbreed-free genetics recourse to hatcheries (local)						Assist linking hatcheries to Halda River carps stocks through Department of Fisheries
1.1.4. Access to inbreed-free genetic resources by hatcheries (exotic)						Thailand trip by partners; link PRICE partner hatchery to Department of Fisheries exotic source
1.1.5. Feed formulation for brood fish						Short-term resources to fish hatcheries/in-house counseling
1.2. Promote year-round supply of fry and fingerlings						
1.2.1. Value addition of quality fish seeds by over-wintering						Assist hatcheries and nurseries on over-wintering with short-term consultant and in-house counseling
1.2.2. Popularization of over-wintered seeds						Assist demo farming, method and result demo
1.3. Group procurement of inputs						Assist farming groups on farming integration with short-term hired resources
1.4. Training on improved and intensive farm management						Assist farming groups on farming integration

Activity in Detail	1 st Quarter*	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
1.5. Training on crop rotational farming						Assist medium and small farmer's training on small-scale farming with consultant
1.6. Training on integrated farming						Dense farming catfish for local and export market by exposure visit to Thailand
1.7. Exposure visits to Thailand						Value chain actors come in contact with better performers in Thailand
1.8. Exposure visits to India						Value chain actors come in contact with better performers in India
2. Access to Finance						
2.1. Capacity buildup and links with microfinance institutions						Workshop on access to finance
2.2. Access to finance (micro-credit)						Linkage workshops for farmers and microfinance institutes
2.3. Long-term microfinance to community growers						Promoting harvest-based repayment schedule
2.4. Access to finance (institutional)						Workshop with public and private banks and medium and large producers
3. Market Linkage						
3.1. Link processors to farmers' group and group marketing						Assist with training on group marketing; link workshop of processors and farming groups
3.2. Enhance capacity to store and transport hygienically						Assist with training of group farmers by short-term consultant
3.3. Technical assistance for developing and marketing non-traditional fish products						Assist with training and linkage with product-specified buyers
3.4. Promote hygienic production and marketing of dry fish						Assist with training on hygienic dry fish production and

Activity in Detail	1 st Quarter*	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
3.5. Market study for catfish and tilapia						marketing/exporting Short-term consultant

SHRIMP

Activity in Detail	1 st Quarter*	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
1. Productivity						
1.1. Facilitate contract farming						Out-growing of shrimp through subcontract to WFC
1.2. Promote the supply of and access of shrimp farmers to screened post-larvae						Support through subcontract of a third-party PCR testing laboratory by WFC
1.3. Promote crop rotation of <i>gol/da</i> , <i>bag/da</i> , and rice						Assist in training farming groups through subcontract by WFC
1.4. Integrated <i>gol/da</i> / <i>bag/da</i> farming with fish and vegetables						Assist to train farming groups through subcontract by WFC
1.5. Support linking farmers to hatcheries producing quality grade HPL						Promote farmer-hatchery linkages through the GHERS project
2. Compliance						
2.1. Labor law compliance in processing plants						Subcontract/short-term consultant to train management and processing workers
2.2. Capacity build-up of research (BFRI) and testing facilities; (FIQC, DoF) Bangladesh government						Assist capacity build-up of public research/testing agencies
2.3. Promote bio-security and Hazard Analysis and Critical Control Point in processing plants						Short-term resources to train processing staffs
2.4. Promote value-added product development						Short-term resources to train processing staffs

LEATHER PRODUCTS

Activity in Detail	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
1. Improving Hides/Skins						
1.1. Flying campaign during Eid-UI-Azha to raise awareness among stakeholders						Associations, government (development partners)
2. Training Workforce						
2.1. Facilitate training for developing skills of new workers to create employment						Associations and lead members, development partners
2.2. Partner with local NGOs in developing skilled workers from their underprivileged community						Associations and lead members, NGO
2.3. Facilitate skill enhancement training for SME supervisors/managers in collaboration with BLSC						Service providers, BLSC (institution/individual), development partners
2.4. Facilitate skill enhancement training for SME-workers directly with SMEs/clusters or through lead firms						Service providers, educational institution, associations
2.5. Ongoing training activities at the Technical Training Center in Tangail, under an agreement among PRICE, BMET, and Apex Adelchi						Association, government
3. Supporting SMEs						
3.1. Facilitate formation of a group/cluster of leather graduate small entrepreneurs in Dhaka						Development partners, educational institution government
3.2. In collaboration with partners such as the ITC, organize a public event to analyze and discuss the future of the leather industry						Association, government, service providers, DPS, SME
3.3. In collaboration with the ITC, facilitate a sector analysis to be used in the above event						Development partners, BLSC, association, government
3.4. Facilitate buyer-seller meetings to increase market links						Associations, service providers, NGOs
3.5. Facilitate exposure trips for SME entrepreneurs/workers/supervisors to large enterprises (local/regional) to see and adopt best practices						Associations, service providers
3.6. Facilitate pilot on process-up gradation, i.e. improving operational flow, floor layout, machine/tools requirements						Associations, service providers, BLSC, educational institution

Activity in Detail	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	5 th Quarter	Resource Strategy
3.7. Explore the possibility of helping SMEs participate in local fairs in Dhaka and Chittagong						Association, government, development partners, service providers
3.8. Facilitate leveraging access to finance components of the ITC for SMEs/clusters in Dhaka and Chittagong to get collateral-free bank loan						Association, banks, banking and industry expert, BLSC, development partners
3.9. Facilitate training on access to finance for SME entrepreneurs to learn the loan application process and requirements for obtaining bank loans						Association, banks, banking and industry expert, development partners, service providers
3.10. Facilitate exposure visits for bankers to SME cluster/industries to gain a better understanding of leather business risks/opportunities						Association, banks, banking and industry expert, development partners, service providers
3.11. Explore facilitating workshops to provide opportunities to banks and SMEs to interact with each other directly to reduce gaps						Association, banks, banking and industry expert, development partners, service providers
4. Developing Service Providers						
4.1. Facilitate strengthening the Bangladesh Leather Service Centre by developing its institutional capacity for conducting chemical/ mechanical tests in its laboratory, as well as to provide training and other services for the industry.						Association, development partners, service providers, government
Identify a group of potential individuals to develop as service providers/trainers in the areas of designing, cutting, sewing and assembling						Association, BLSC, development partners

ANNEX D. FY 2010 BUDGET PROJECTION

Line Item	Projected Amount
Salaries	\$310,600.00
Fringe	\$205,611.00
Overhead	\$310,096.00
Travel And Transportation	\$65,447.00
Allowances	\$132,402.00
Other Direct Costs	\$128,089.00
Equipment, Vehicles, Freight	\$22,960.00
Subcontracts	-\$335,744.00
Strategic Competitiveness Fund	
• Aquaculture	\$828,363.00
• Leather	\$263,158.00
• Horticulture	\$419,000.00
Subtotal	\$2,349,982.00
General And Administrative	\$129,018.00
Subtotal	\$2,479,000.00
Fixed Fee	\$119,975.00
Grand Total	\$2,598,975.00