Report on

Analyze Sectors and Market Systems by Collecting Pro-Poor Relevant Data

Prepared for

Care Bangladesh

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Contents

Executive Summary

Shomoshti - Prosperity for the Poor and Disadvantaged is an SDC mandated project to make a social and economic impact on the well-being of rural households, particularly the poor and disadvantaged by ensuring higher incomes, better nutrition and more education. The cross-cutting themes are in line with poverty, food security, nutrition, water and sanitation, inclusive economic growth, women empowerment, climate change, and inclusive and responsive institutions. Shomoshti's aspects of food and nutrition security, inclusive social services aspects, and empowering local communities with particular focus on women will contribute to the seventh Five Year Plan of GoB. This plan is focusing on inclusive growth by empowering citizens. The project intends to address market constraints, which affect the participation of the poor and disadvantaged through dialogue with local government institutions and policy-setting government agencies at the regional/ national level as appropriate.

The primary goal of the study is to acquire sufficient information for Shomoshti to design specific pull strategies for inclusive market development, which would ensure sustainable livelihoods and better access to improved technical and social services for the beneficiaries of the project. To achieve this, we have identified 13 sub-sectors for a full range of analysis within four geographic regions according to project's mandated territory. After that, detail analysis has been conducted on vegetable, captured and dry fish, lemon, pineapple, hand stitch, crab fattening, medicinal plant, woolen blanket, bamboo, aromatic rice, jujube, and tailoring market systems to understand power dynamics, constraints and vulnerabilities and formulate strategies to promote market-based solutions, which will result in more sustainable livelihoods and better access to improve technical and social services for the target population.

The study was carried out in three project zones- northwest (Gaibandha, Nilphamari, Dinajpur, Shirajganj, Rajshahi), Northeast (Sunamganj, Moulavibazar, Sylhet), and Southwest (Satkhira, Jessore, Khulna). The assessment took a methodological approach that combined qualitative,

limited quantitative analysis, stakeholder consultations and engagement, as well as SWOT analysis, and problem-constraint-underlying cause-intervention (intervention logic analysis-ILA) analysis. To gather necessary data from the field, the assessment applied a mix of diverse techniques like inception and validation meeting with project staffs, individual interview, FGD, KII, stakeholder consultation, projective and observation method.

Proper investigation, observation and data collection to assess a value chain requires significant amount of a time as there are different types of core value chain actors, service market actors and regulatory actors acting in the value chain. However, due to budgetary constraints, the team could spend only one day in the field for primary data collection. We believe, that our investigations would have been more thorough and comprehensive if we had more time and budgetary provisions. Because the team adopted grounded theory approach in data collection, meetings could not be pre-arranged. Therefore, the team often did not get the right person that they wanted to interview.

Initial value chain shortlisting was conducted by reviewing different project documents and value chain assessment reports. The value chain reports were produced by renowned agencies, by using the experience of our in-house consultants and field level project staffs, who have vast experience in local contexts of different regions, summary of Shomoshti Potential sub-sector lists, and discussions with STM and RPMs of Care Bangladesh.

Based on our literature review, potential value chains are embroidery, vegetable, poultry, duck (for meat and egg), dairy, and bull/beef fattening in Bogra region; embroidery, vegetable, poultry, duck (for meat and egg), jute diversified product, dairy, and beef fattening in the Rangpur region; vegetable, poultry, duck (for meat and egg), fish culture, lemon, pineapple, bull and beef fattening in the Sylhet region; flower, nokshi katha, crab fattening, fish culture, dairy value chains in the Khulna region.

For detailed assessment, the study team selected the following 13 value chains. These value chains were selected for further assessment not only because they received good scores during primary selection (based on criteria and weightage), but also because research data on these value chains are rare/unavailable and the project felt it was necessary that further data collection on those are needed. The list was vetted by Care Bangladesh officials. Overview of each value chain is given in the following paragraphs.

Vegetable

As our findings suggest, if relevant interventions can be taken against constraints like lack of knowledge on improved production practices, lack of access to different services and lack of access to large buyers/ high-end buyers, this can be a potential value chain **for Sylhet regions** which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing vegetable value chain include- facilitate the dissemination of information on proper cultivation technique, facilitate linkage with extension service providers (DAE); DAE can be also linked with input companies during capacity development or promotional activities, facilitate linkage with improved seed and pest management service providers; facilitate them in providing embedded services. If suggested interventions can be undertaken by the project, this value chain can enhance household income,

nutrition level of family members and improve the condition of women and disadvantaged groups.

Captured and Dry Fish

Captured and dry fish could be a potential value chain for **Sylhet region**. The problems include lack of access to water bodies, reduced income from dry fish processing, and lack of obedience to the national rules and regulations. It would increase the income of the poor, especially of women and disadvantaged people. Recommended interventions for this value chain include but are not limited to- encouraging proper implementation of national policy, promoting collective lease by local fishermen, and creating awareness on fishing policy and regulations. They also include facilitation of training on the capacity development of women regarding improved fish drying procedures and technologies. If suggested interventions can be undertaken by the project, this value chain can improve the conditions of poor women and disadvantaged groups hence boost household income.

Lemon

Lemon can be a high potential value chain for Sylhet region if relevant interventions can be taken against constraints mentioned below. The constraints of this value chain include low production, environmental problems, low profitability, lack of irrigation facilities, probable fruit damage, and lack of knowledge on new technologies regarding production. It would increase the income of the poor, especially of women and aboriginal people. Suggested interventions for developing lemon value chain include- facilitation of training or capacity development on scientific cultivation, facilitation of training or capacity development on post-harvesting procedures, and facilitation of linkage with high-end forward market. If suggested interventions can be undertaken by the project, this value chain can boost household income, and improve the condition of women and aboriginal groups.

Pineapple

Pineapple can be a high potential value chain for **Sylhet region** if relevant interventions can be taken against constraints mentioned below. The problems include low production, environmental problems, low profitability, lack of irrigation facilities, probable fruit damage, and lack of knowledge on new technologies regarding production. It would increase income of the poor, especially of women and aboriginal people. Suggested interventions for developing pineapple value chain include- facilitation of training or capacity development on scientific cultivation, facilitation of training or capacity development on post-harvesting procedures, and facilitation of linkage with high-end forward market. If suggested interventions can be undertaken by the project, this value chain can boost household income, and improve condition of women and aboriginal groups.

Hand stitch

Lack of knowledge on modern production techniques, lack of access to appropriate financial product/services, unavailability of local mechanical/ technical service providers, lack of access to forward market channels are the constraints of tailoring value chain. Tailoring business can be a **potential value chain for Jessore district** which would increase income of the women. Suggested interventions for developing hand stitch value chain include- facilitate training service

provisions through public and private sector on product development and diversification and develop LSP to provide quality enhancement service like over-locking embroidery by automatic machine, washing and calendaring. If these can be undertaken by the project, this value chain can enhance income, involvement of the poor and improve the condition of women.

Crab

Crab can be a high potential value chain if relevant interventions can be taken against constraints such as dependency on nature for inputs leading overfishing of crablets, increased risks (tiger, pirates, and so on) associated with crablet catching making the collectors vulnerable, lack of access to water bodies for poor or marginal farmers and lack of access to knowledge on farm management, improved production processes, cost-effective technologies and management techniques this can be a **high potential value chain for Khulna region** which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing crab value chain include- facilitate research and development on crab hatchery, introduction of cage cultivation of crab, facilitate training service on scientific crab fattening. If suggested interventions can be undertaken by the project, this value chain can improve the condition of women and disadvantaged groups as well as enhance household income to a great extent.

Shrimp and Cultured fish

According to our findings, if relevant interventions can be taken against constraints such as lack of access to water bodies like gher, requires high investment, lack of knowledge on proper integrated cultivation practice and disease (especially virus) management, lack of access to good quality low cost post larva (PL)/ fingerling, this can be a potential value chain for southern region which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing shrimp and cultured fish value chain include- facilitate access to quality input, facilitate linkage with appropriate financial services, and facilitate training/ capacity building on modern and standard cultivation practices and technologies. If suggested interventions can be undertaken by the project, this value chain can improve the condition of poor, women and disadvantaged groups as well as earn foreign revenue.

Medicinal Plant

Unavailability of proper input especially sapling or seed and lack of knowledge on demand and quality production are the constraints of medicinal plant. The medicinal plant can be a potential value chain for Gaibandha district. Suggested number of interventions for developing medicinal plant value chain include- form producers group and promote collective production of more high value plant, facilitate access to multiple large buyers or processors (e.g., pharmaceutical or cosmetics companies), facilitate linkage with improved sapling/seed and service providers; facilitate them in providing embedded services, facilitate training/ capacity development of producers on modern production practices and technologies. If suggested interventions can be undertaken by the project, this value chain can improve the condition of poor, women and disadvantaged groups as well as improve the household income.

Warm cloth

As our findings suggest, if relevant interventions can be taken against constraints such as lack of access to appropriate financial product/services, lack of access to high-end round the year market demand this will not be a potential value chain for Gaibandha district. Suggested interventions for developing hand stitch value chain include- facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producer's requirement, facilitate in developing service groups like pre-production (yarn conning) and post-production (sewing, calendaring) and facilitate linkage with high-value product and export market. However, suggested interventions can be undertaken by the project; this value chain cannot change the status of women or disadvantaged people.

Bamboo

Lack of attitude, interest and knowledge on producing high value or diversified product, unavailability of raw material and lack of access to appropriate financial product/services are the constraints of this value chain. Bamboo value chain can be a potential value chain for Nilphamari and Gaibandah which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing bamboo value chain include- facilitate training service provisions through public and private sector on product development and diversification, ensure availability of raw material from planted and natural resources and facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producer's requirement. If suggested interventions can be undertaken by the project, this value chain can improve the condition of women and disadvantaged groups as well as enhance household income to a good extent.

Aromatic Rice

As mentioned in the recommendation section, if relevant interventions can be taken against constraints such as unavailability of improved quality seed, lack of proper information on market demand and supply situation and product prices, lack of proper information on market demand and supply situation and product price, this can be a high potential value chain for Dinajpur District which would increase income of the poor and ensure high profit. Suggested interventions for developing aromatic rice value chain include- facilitate linkage with improved quality seed input suppliers; facilitate them in providing embedded services, facilitate linkage with millers or miller commission agent to ensure highest competitive price and information of demand and market price. If suggested interventions can be undertaken by the project, this value chain can enhance household income, bring foreign money and improve the condition of women and disadvantaged groups.

Jujube

Jujube will struggle to become a potential value chain for Rajshahi district. The problems remain in low profitability, low yield, and lack of knowledge. Suggested number of interventions for developing jujube value chain are introduction of high yield variety and proper integrated cultivation techniques, facilitation of training on scientific cultivation and post-harvesting procedure, facilitation linkages with high end forward markets, dissemination of knowledge,

creation of awareness in balanced use of fertilizer and pest/disease management, facilitation of linkages with extension service providers (DAE), ensuring efficient transportation and linkage with storage facilities. If suggested interventions can be undertaken by the project, then there is a probability to make an impact on the beneficiaries.

Tailoring

It is hard to make tailoring value chain as a potential one for Sirajgonj district. Constraints found are such as lack of knowledge in high-end/large buyer demand, lack of access to forward market channels, unavailability of local mechanical/ technical service providers, lack of business planning, lack of collective production or sells. Suggested number of interventions for developing tailoring value chain include promotion of training service provisions through public and private sector, improvement of knowledge and skills of entrepreneurs, promotion of awareness and linkage activities in forward market, ensuring consistent or regular demand of tailoring product throughout the year, and identification and development of linkage with potential large enterprises. If suggested interventions can be undertaken by the project, then there is a probability to make an impact on the women for their income generation.

ACRONYMS

BADC	Bangladesh Agriculture Development Corporation
BCIC	Bangladesh Chemical Industries Corporation
BDT	Bangladeshi Taka
BSCIC	Bangladesh Small and Cottage Industries Corporation
CNRS	Centre for Natural Resource Studies
CPL	Consiglieri Private Limited
DAE	Department of Agriculture Extension
DAP	Di Ammonium Phosphate
EPB	Export Promotion Bureau
FGD	Focused Group Discussion
FMCG	Fast Moving Consumer Goods
JCF	Jagoroni Chakra Foundation
LSP	Local Service Providers
MOP	Muriate of Potash
NGO	Non-Government Organization
RDRS	Rangpur Dinajpur Rural Service
SAAO	Sub Assistant Agricultre Organization
SDC	Swiss Development Corporation
SDG	Sustainable Development Goal
STM	Senior Technical Manager
SWOT	Strength, Weakness, Opportunity and Threat
RPM	Regional Project Manager
TSP	Triple Super Phosphate
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background

Shomoshti - Prosperity for the Poor and Disadvantaged is an SDC mandated project which will be implemented by a team led by CARE Bangladesh. Shomoshti project's social and economic impact will benefit the wellbeing of rural households, particularly the poor and disadvantaged by ensuring higher incomes, better nutrition and more education. Shomoshti project will be partially based on learning from the Samriddhi project (from 2010 till early 2015), and will directly contribute to the priorities and objectives of Swiss Development Cooperation (SDC) in Bangladesh. Shomoshti will also contribute to the Sustainable Development Goals (SDGs) and the 7th Five Year Plan of Government of Bangladesh (GoB) by addressing issues related poverty, food security, nutrition, water and sanitation, inclusive economic growth, women empowerment, climate change and inclusive and responsive institutions. Shomoshti's aspects of food and nutrition security, inclusive social services aspect and empowering local communities with particular focus on women will contribute to the 7th Five Year Plan which primarily is focusing on inclusive growth and empowering citizens.

Shomoshti project will be implemented in three phases using complementary "push" and "pull" strategies. The project envisions that in Phase I, 200,000 rural households will use improved technical services, which will result in higher yields, better prices and increased income. The project intends to work on organizational capacity building of producer groups and want to facilitate support from private and public service providers for development of pro-poor services in agriculture, agribusiness and home and cottage based activities which are relevant and affordable to the poor and disadvantaged. The project also wants to support resilience of households and communities through access to savings systems and extension to other services. The project intends to address market constraints which affect the participation of the poor and disadvantaged through dialogue with local government institutions and policy-setting government agencies at regional/ national level as appropriate.

With these project purposes and project goal, Shomoshti assigned Consiglieri Private Limited (CPL) to assess important value chains and design its interventions and activities. CPL was assigned to provide sufficient information for Shomoshti to design specific strategies for inclusive market development to ensure sustainable livelihoods and better access to improved technical and available social services for the beneficiaries of the project. Shomoshti wanted CPL firstly to Identify 12 sub-sectors for full range of analysis within four geographic regions according to project's mandated territory, and then to conduct a detailed analysis of selected market systems to understand power dynamics, constraints and vulnerabilities and formulate strategies to

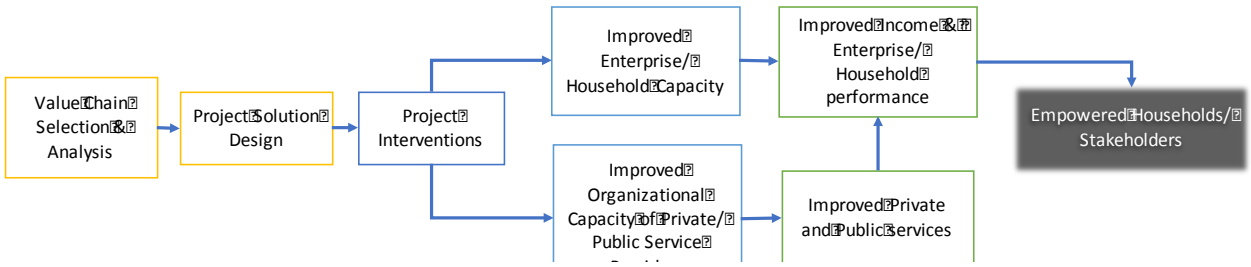


Figure 1: Theory of Change Model and why this assignment is so crucial

promote market-based solutions. The Theory of Change model of this project and why this assessment and solution design are so crucial is schematically shown in the next diagram.

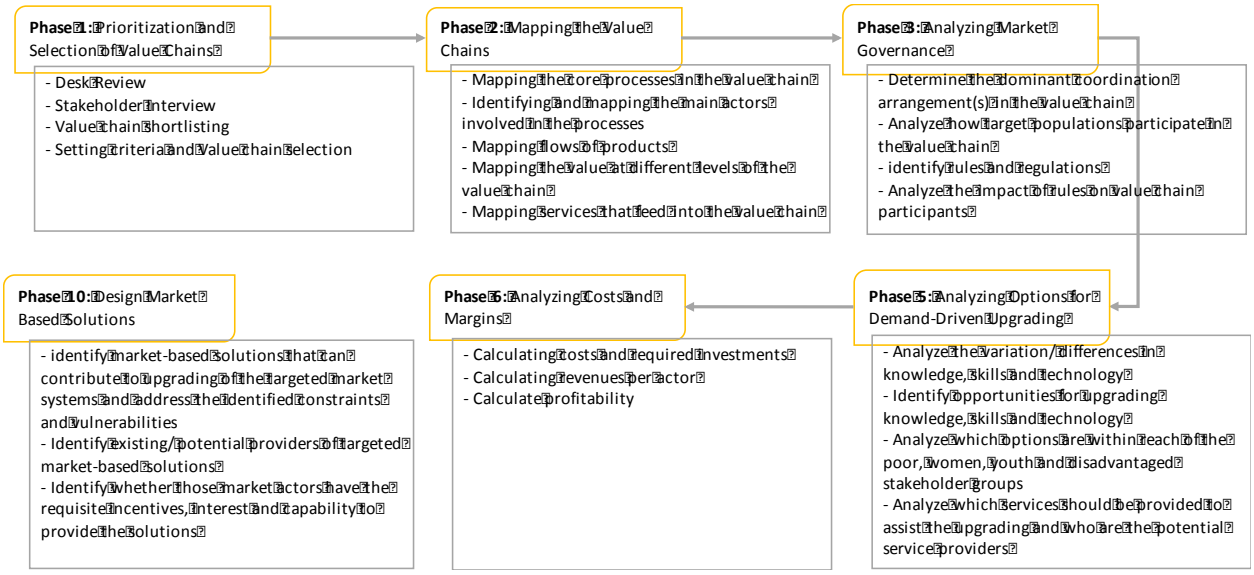
1.2 Study Methodology

Analytical Approach

CPL followed DFID's value chain analysis approach[1] in value chain assessment and intervention design. The key analytical phases in this assignment followed were:

Phase 1: Prioritization and Selection of Value Chains
Phase 2: Mapping the Value Chains
Phase 3: Analyzing Market Governance
Phase 4: Analyzing Options for Demand-Driven Upgrading: Knowledge, Skills, Technology and Support Services
Phase 5: Analyzing Costs and Margins
Phase 6: Design Market-based Solutions

These analytical phases to accomplish the assignment are presented in the diagram below.



Sample Size and Distribution

The number and type of actors involved under different value chain varies according to that particular product/ subsector variety we're considering here, geography, environmental factors and other external factors. Therefore, the study team did not predefine the number and distribution of respondents across project areas.

Rather, grounded theory approach will be adopted during data collection and analysis. CPL used Grounded Theory Approach in data collection and analysis. Respondents were selected and interviewed until repeated answers were found. Because of adopting this particular approach (Grounded theory Approach), data collection was likely to begin with a question, or even just with the collection of qualitative data. As our researchers reviewed the data collected, repeated ideas, concepts or elements became apparent, and were tagged with *codes*. As more data were collected, and as data were re-reviewed, codes were grouped into concepts, and then into categories. These categories became the basis for new theories/ findings/ facts. Thus, the researcher chooses an existing theoretical framework, and only collected data to show how the theory did or did not apply to the phenomenon under study.

Generic respondent categories are given beside. (detailed list of respondents for different value chains are given in the annex).

Possible Respondent Category
Input Sellers
Producer/ Farmer
Input Seller
Trader
Retailer
Consumer/ End market
M/C and farming Service provider
Financial Service provider
Post-harvest Service provider
Public and development bodies
Administration
Association

1.3 Data Collection Method

FGDs and In-depth interviews with market actors and stakeholders was the major data collection tool used in this assignment. The table below shows the use of different data collection tools in different phases.

Category	Data Collection/ Execution Method
Value chain selection	Literature Review; Stakeholder interview
Value chain assessment	FGD with producers; In-depth interview with market actors
Findings validation	FGD and discussion with stakeholders

1.4 Study Limitation

Some of the limitations that consultants faced during this assessment include:

- Proper investigation, observation and data collection to assess a value chain requires significant amount of time as there are different types of core value chain actors, service market actors and regulatory actors acting in the value chain. However, due to budgetary constraints, the team could spend only one day in the field for primary data collection. We believe that our investigations would have been more thorough and comprehensive if we had time and budgetary provisions.
- Because the team adopted grounded theory approach in data collection, meetings could not be pre-arranged. Therefore, the team often did not get the right person that they wanted to interview.

CHAPTER TWO: VALUE CHAIN SELECTION

Value chain analysis started with the selection of value chains. In discussion with SHOMOSHTI staff, CPL team created an initial list of more than 40 value chains in the four working regions. After the initial listing of the value chains, CPL conducted desk reviews on potential value chains in different project regions. From the facts and findings found from the desk review and also from the regional project staff, the team then weighed different value chains of the initial list against some set criteria and finally, came up with a list of 12 value chains that received highest scores in the selection matrix. Finally, CPL team sat with the project staff and validated (and finalized) their list of value chains.

Initial List Value Chains for Further Review

Dairy Milk	Goat and Sheep
Maize	Aloevera (Medicinal Plant)
Poultry, Duck, Egg	Flower
Mustard	Woolen/Cotton (Old+New) product weaving
Vegetable	Bengal (Shakha) , Topor
Rice/Aromatic Rice	Nokshi Khtha, Mora, Comb, Gur Processing
Chili	Wooden Furniture
Fish (capture, culture) Dry Fish	Bamboo/Cane (Diversified Product)
Shrimp (Golda & Bagda)	Garlic
White fish pork	Mug Dal
Pineapple	Potato
Guava	Jute Diversified Use
Mango	Crab Fattening
Onion	Honey
Bull/Beef Fattening	Lemon

2.1 Value Chain Selection Criteria

Because the key entry point of the value chain analyses is poverty alleviation and achieving pro-poor outcomes, the criteria CPL team deployed reflected the following key issues:

(1) Potential of the value chains to improve livelihoods of the poor people

- Potential to engage large number of poor households in the market, particularly women and youth
- Potential of the product/activity for poverty reduction
- Potential for labor intensive technology

- Low barriers to entry for the poor (capital, knowledge)
- Available access to support services

(2) Market potential

- Strong local, domestic and/or international demand for the product
- Growth potential of certain products/activities
- Possibility for scaling up
- Presence of Lead Firms active in the market system
- Potential for leveraging public investment with private investment
- Involves a large number of people

(3) Targeted stakeholder group criteria

- (Agency and Relations) Women, youth and disadvantaged people's capacities as individuals to participate within the market system and expand agency and alter structures within the market system
- (Structure) social and cultural norms and institutions that codify and reinforce gender relations at every level of society

(4) Other criteria, such as

- Environmental sustainability
- Necessary geographic and cultural variability
- Within framework of national and regional strategies
- Low risk

Criteria and Weightage for shortlisting

Criteria	Weight (%)	Score Range (1-10)
Potential to Improve Income	20	
Market Demand	20	
Inclusion of women, youth and disadvantage group	20	
Reliance to environment/climate change	15	
Product Expansion/Scale Up Opportunity/Growth Potential	10	
Market Viability/Accessibility/Linkage Opportunity	10	
Skill and capacity	5	

The weightage was selected based on client's priority on their project goal and objectives. After literature review and based on the information gathered of value chains of the above seven criteria were ranked on a scale of 1 to 10 where 10 denotes high ranking and 1 denotes low. After that score was multiplied with weight against each criterion. Finally, all the multiplied scores were summated.

2.2 Suggested Value Chains that the Project Need to Embark On

A thorough literature review of existing assessments, reports and documents (e.g., value chain reports, current program reports for Samriddhi, M4C, Katalyst and other relevant projects as well as from CARE Bangladesh and its partners) was conducted in order to guide the market system selection process. The review helped CPL team in scoring different value chains and also in elaborate study design.

The following tables show weighted score of different value chains in different project regions. These tables suggest that the project should give more considerations to the value chains that received higher scores.

Bogra Region:
According to our review and the scoring given below, the project should work with embroidery, vegetable, poultry, duck (for meat and egg), dairy for milk and bull/beef fattening value chains in the Bogra region.

For Bogra Region	
Value Chain	**Weighted Score**
Embroidery (Karchupi)	730
Vegetable	725
Poultry, Duck, Egg	685
Dairy Milk	675
Bull/Beef Fattening	665
Sataranji	660
Onion	655
Mango	650
Mustard	650
Rice/Aromatic Rice	625
Maize	620
Aloevera (Medicinal Plant)	615
Garlic	595
Mug Dal	560
Guava	545

Rangpur Region:

Our analysis suggests that the project should work with embroidery, vegetable, poultry, duck (for meat and egg), jute diversified product, dairy for milk and beef fattening value chains in the Ranpur region. Suggested value chains are tabulated below according to the scores they received.

For Rangpur Region	
Value Chain	**Weighted Score**
Embroidery (Karchupi)	730
Vegetable	725
Poultry, Duck, Egg	685
Jute Diversified Use	685
Dairy Milk	675
Bull/Beef Fattening	665
Bamboo/Cane	665
Sataranji	660
Chili	655
Mango	650
Potato	635
Rice/Aromatic Rice	625
Maize	620
Aloevera (Medicinal Plant)	615

Sylhet Region:

Our findings suggest that the project should work with vegetable, poultry, duck (for meat and egg), fish culture, lemon, pineapple, bull and beef fattening value chains in the Sylhet region. Suggested value chains are tabulated below according to the scores they received.

For Sylhet Region	
Value Chain	**Weighted Score**
Vegetable	720
Poultry, Duck, Egg	685
Fish Culture	685
Fruits (Pineapple, lemon)	670
Bull/Beef Fattening	665
Bamboo/Cane	665
Goat and Sheep	605
Honey	580
Dry Fish	540
Fish capture	475

Khulna Region:

According to our review and the scoring given below, the project should work with flower, nokshi katha, crab fattening, fish culture, dairy milk value chains in the Khulna region.

For Khulna Region	
Value Chain	**Weighted Score**
Flower	710
Nokshi Katha	695
Crab Fattening	685
Fish Culture	685
Dairy Milk	675
Bull/Beef Fattening	665
Vegetable	660
Mango	650
Shrimp (Golda & Bagda)	635
Wooden Furniture	555
Dry Fish	540
Fish capture	475
Comb	450
Topor	425
Pork	Not Found
Bengal (Shakha)	Not Found
Gur Processing	Not Found

2.3 Value Chains Selected for Detailed Assessment

For detailed assessment, the study team selected the following thirteen value chains. These value chains were selected for further assessment not only because they received good scores during primary selection (based on criteria and weightage), but also because research data on these value chains are rare/unavailable and the project felt it necessary that further data collection on those are needed. The list was vetted by Care Bangladesh officials.

Selected Value Chain	
Sylhet Region	**Rangpur Region**
Vegetable	Medicinal Plant
Capture Fish	Woolen Blanket (Home cottage)
Lemon	Bamboo
Pineapple	Aromatic rice

Southern Region	Bogra Region
Hand Stitch (Home cottage based)	Jujube
Crab Fattening	Tailoring
Fish Culture	

2.4 Study Area for Detailed Assessment

The study team analyzed 13 value chains in eleven upazilas of eleven districts. Areas where more people are involved in any particular value chain and where it has growth potential were selected for the assessment.

Zone	District	Upazilla
Northwest	Gaibandha	Polash Bari and GobindaGanj
	Nilphamari	Saidpur and Domar
	Dinajpur	Phulbari
	Shirajganj	Kamarkhand
	Rajshahi	Puthia
Northeast	Sunamganj	Duara Bazar
	Moulavibazar	Sreemangal
	Sylhet	Gowain Ghat
Southwest	Satkhira	Shyam Nagar
	Jessore	Keshobpur
	Khulna	Rupsha

3.1 VEGETABLE VALUE CHAIN ANALYSIS

3.1.1 Background

Vegetable cultivation mostly acts as earning as well as a nutritional source. There is a nationwide round the year high demand of different vegetables. For women, in particular, the vegetable is an important sector (around 60% of the rural women had participation in vegetable cultivation). While women are rarely involved in buying inputs (such as seeds and fertilizers), homestead production is undertaken primarily by them and recently women are more involved in the vegetable cultivation process. Return on investment for the vegetable is also high in comparison with other crops (1.77 in vegetable in comparison with 1.44 in Rice and 1.53 in Jute)[1].

3.1.2 Product Analysis

Farmers in the assessment area of Gowainghat Upazila focus primarily on a single crop (rice) once a year and vegetable are confined in winter varieties for several reasons like water logging and lowland. Therefore, almost every household in assessment area is involved with fish capture in the Goain river. The entire Sylhet region mostly depended on other districts like Jessore, Bogra and Narsingdi for summer vegetable. However, the demand of vegetable is very high. To cop up with this demand situation, farmers have been trying to increase vegetable production for last few years. The demand-supply gap along with the return on investment indicates the huge potential of more farmers adopting vegetable as a cash crop. Table-1 shows that production of vegetable in Gowainghat (assessment area) is less than Kanaight upazilas in Sylhet.

Area and production of Vegetable 2010-11

Vegetable	Upazilla	Area (Acre)	Production (MT)
Tomato	Gowainghat	287	522.34
	Kanaighat	506	3500.00
Radish	Gowainghat	238	424.84
	Kanaighat	618	3800.00
Bean	Gowainghat	368	401.12
	Kanaighat	741	3600.00
Pumpkin	Gowainghat	240	362.81

[1] Himel, F, 2013, "Vegetable Seed Market Assessment in Bangladesh", Developed for EU funded ANEP Project

Vegetable	Upazilla	Area (Acre)	Production (MT)
	Kanaighat	580	1125.00
Cabbage	Gowainghat	165	419.58
	Kanaighat	865	6500.00
Eggplant	Gowainghat	151	218.95
	Kanaighat	370	1250.00
Lady's finger	Gowainghat	57	16.53
	Kanaighat	0	0.00
Cauliflower	Gowainghat	165	432.2
	Kanaighat	840	4200.00
Cucumber	Gowainghat	166	278.88
	Kanaighat	112	450.00

Source: District Statistics 2011, Sylhet, June 2013, BBS; Page: 41-43.

In the study area in Gowainghat, almost all agricultural land can be considered as lowland with the intensity of monsoon rain and flash flood which is not suitable for around the year vegetable production. Farmers prefer mustard, black gram to vegetable cultivation in rabi season. Prominent vegetable cultivated in the study area are french bean (Forash), sweet potato, radish, pumpkin, small cucumber (khira), tomato, eggplant, bitter gourd, cowpea, data, lau-shak. But there is a good demand of vegetable which encourages farmers to cultivate various types of winter vegetable. Farmers prepare their land in late Ashwin (first week of October) with power tiller and by hand tilling. Farmers found in the study area are totally deprived of latest technology, advanced farming knowledge and information. They were seen using compost and little amount of chemical fertilizer mainly urea and pesticides. After harvesting farmers often do sorting and grading for a better price.

Work Allocation

During field visit, the study team found that homestead production of vegetable is traditionally being managed by women, like hand tilling, weeding, harvesting except selling output product. Women also have significant involvement in the post-harvest processes like cleaning, grading, sorting and packing. In hence, most of the times, they perform those as a household member and do not get paid. So the participation of women in the vegetable value chain is limited and not income oriented.

Inclusion of Gender

Homestead production of vegetable is traditionally being managed by women, apart from selling the outputs. But, in Bangladesh commercial farming is primarily being managed by the male. The field observation in the study area revealed that there is no woman participation in service or input market like input selling or tractor rental. We could identify the major reason behind such limited participation as a social practice of women involvement as an entrepreneur in the respective areas. Although women have involvement in homestead gardening and household labor in commercial farming. But **there are opportunities for women to become input selling service providers in seed, fertilizer and pesticides.** Large investment in terms of fixed cost is not required in this business. If the target is homestead vegetable producers, then the business persons would not even require a shop; rather they can operate from their household. However, linkage with knowledge sources like seed or pesticide company market developers or promoters will be required to make it effective. **Agro-machineries rental services can be another potential area to involve women.** There is no physical labor involved in this and hence is quite convenient for women. However, a significant fixed cost is required to initiate this business. Hence, access to finance is required.

Cost Benefit Analysis

Type of Vegetable: Eggplant
Land size-33 decimal
Cultivation Duration: 4 months

Item	Explanation	Cost (BDT)
Irrigation	Traditional manual irrigation	-
Tilling		1000
Sapling	Often they use retain seed, it requires 200gm seed for 33 decimals and takes 35-40 days to grow the sapling before planting in the field.	1300
Fertilizer	Mostly urea	1200
Pesticide	Use 8 times	800
Labor	Self/family labor throughout the cultivation	
Transport	By boat	200
Total Production Cost		**4500**

Sales and profit

Average Eggplant production in one season	Average Price of Eggplant per Mound	Total sells
25 Mound (sale 20 mounds own consumption 5 mounds)	600	12,000

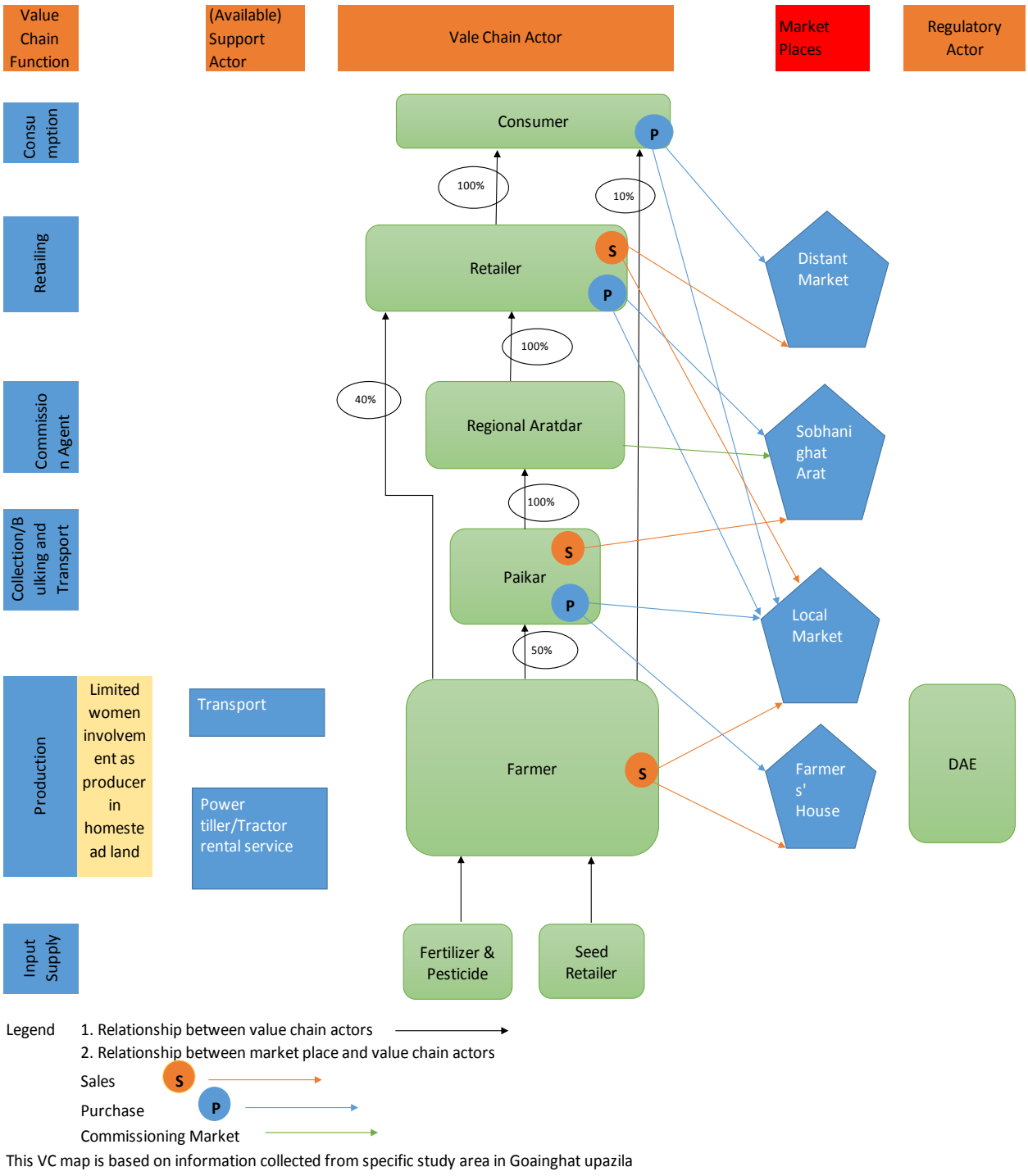
Total Sells = BDT 12,000

Total Production Cost= BDT 4,500

Total Benefit= 12,000-4500 = BDT 7,500

Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 7,500/4,500= 1.67

3.1.3 Vegetable Value Chain Map



Value Chain Map of Vegetable

3.1.4 Input and Service Market Analysis

Inputs (Seeds; fertilizers; pest): Inputs used in vegetable production can be distinguished into two boarder groups – seeds and agrochemicals (like fertilizers, pesticides and micronutrients). Farmers prefer branded packet seed; but because of lack of finance most often them have to

purchase seeds from mobile seed vendors of local haats or from neighbors or have to use their own seeds. No packed inputs are sold in the nearest market of VC assessment area (Cholitabari, Gowainghat) as there ae no relevant shop there.

Branded seeds and pesticides were found to be marketed by the permanent input retailers of the market collected from large seed selling store namely 'Sylhet Beez Ghor' in Sylhet. Sometimes they supply specific products based on farmer demand. During the field visit, the study team found seed vendors selling only seeds, collected from farmers and large seed seller based in Sylhet. Fertilizers and pesticides were seen to be the highest selling agrochemicals. Retailers collect fertilizer from BCIC and BADC dealers and pesticide from various private companies.

Marketing staffs of private companies maintain communication with retailers but in the study area, company agents do not go up to the farmers.

Quality seeds are also not always available in the local market/ input retailer, especially during peak sowing season. Because the demand for those seeds are still low, these local retailers often do not sell those seeds. Also, seed packet size is usually large and small farmers cannot buy those as their individual requirement is small.

Natural or improved pest management technologies (e.g., sex pheromone trap) were also not found in in nearby market because of low demand from local farmers.

Power Tiller/Tractor Service Provider: Lager farmers own power tillers and machine tools for their own and rent out to other farmers. Usual farmers do not have the buying capacity of power tiller.

In many cases irrigation and tilling are not necessarily separate business entities. In case of power tilling, irrigation and transportation service providers, the fixed cost is high in terms of purchasing tractors, pumps, boats etc.

Irrigation service: A few large farmers cultivate vegetable in the winter season through the irrigation process. Otherwise a usual small farmer does not use irrigation process. They plant vegetable by manual irrigation system and it is resulting low productivity.

Labor: In the study area farmers employ self and family labor for vegetable cultivation and often exchange labor help with neighbors for rice or other crop cultivation.

It's necessary to facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with farmers' demand

Knowledge and Information/ Extension Services: Farmers do have knowledge on improved production practices (which includes improved seeds; soil quality; use of inorganic and organic fertilizers; natural pest management techniques, post-harvest technologies). Besides, farmers have lack of information on demand (product specifications) of large/ institutional buyers.

Limited coverage of extension services (DAE), lack of access to extension services (DAE) and lack of promotional and demand pulling/ pushing activities by agro-input companies (like farm family meeting or prescription through their market development or sales forces) were identified as the major underlying service weaknesses behind this constraint.

Financial Services: Although MFI has been a major actor in providing loan, but their products have weekly installment system and do not consider particular vegetable production cycle or farmer demand.

Other Services: Access to soil testing services was also found limited. At present this service is provided by DAE, but farmers reported it as a complex and time consuming service/ process.

3.1.5 Output Market Analysis

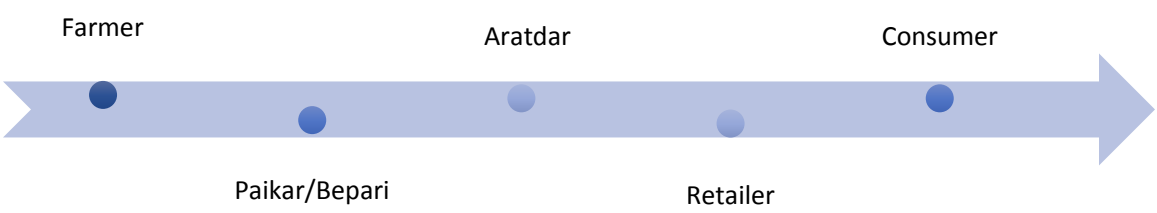
Output market for the vegetable being produced in Kanaighat, and Gowainghat can be categorized into two types– local market and divisional market. In the areas, closer to the production area, farmers mostly sell vegetables in local markets to local consumers and local and outside trader. The outside traders are actually retailers who buy from the farmers and sell it to their market. In peak season like winter, paikars mostly buy from the farmers at union and upazila level physical markets. Then they transport it to district arot and outside retailers buy from them. Sometimes the arots of district physical market buy from the paikars and export it to neighboring districts.

However, farmers have lack of access to large buyers/ high end forward market channels. This has implications in production, product specifications and sales price (e.g., farmers are not producing according to large buyer/ high end buyer demand specifications; farmers selling their produce in local markets in lower price).

Major Market Channels

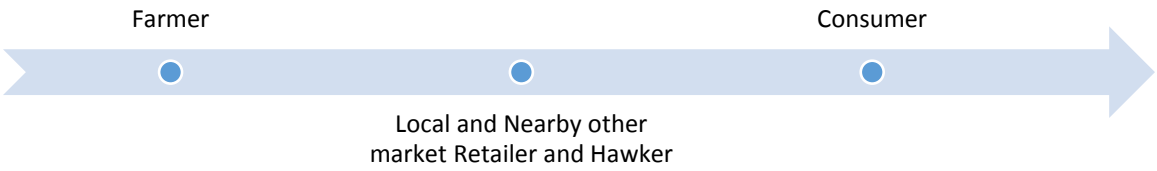
Major market channel models found in vegetable market system in study area are described below:

Channel-1:



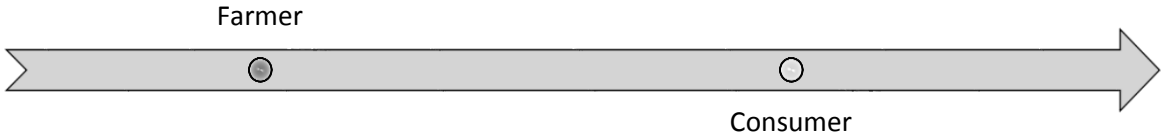
Channel-1 was found as the most prominent and practiced by the actors. Here farmers bring their vegetables to local market and sell to paikars. Often paikars go to farmers' house to procure vegetable. After that paikars bring their product to aratdar in sobhanighat arat. Aratdar facilitate sales to retailers in auction and arat staffs do the work of weighing and auctioning. Aratdar charges 4% commission of the auctioned price, for their services and costs involved. Retailers buy products from these arats and lastly sell those to end consumers in the local markets or by hawking.

Channel 2:



In this market system, local retailers and retailers from other nearby union or town markets procure vegetables directly from farmers in village markets. After that local retailers sell their products on that very market and nearby market retailers and hawker take their products to their retail market or area and sell them to end consumer.

Channel 3:



In the case of Channel 3, farmers directly sell products to consumers in local rural market, these consumers are mostly local consumers.

3.1.6 Enabling Environment

Infrastructure: Overall road and communication system is not good. There is no direct road communication with Upazia Sadar, only water transport.

Public Body: As the assessment area is remote in place and road communication system is not good that is why there is absence of DAE activity. At present, there is a lack of access to soil testing services.

Presence of development actors: Currently no NGO is working in vegetable value chain development. Only one NGO (CNRS) is working on environment related issue.

3.1.7 SWOT Analysis

Strength	Weakness
• Greater women involvement especially in homestead vegetable cultivation • Meeting up household nutritional requirement • Availability of land in the winter season	• Low-quality seed and traditional farming • Improper irrigation system • Availability of quality inputs • Absence of financial service/product • Lack of knowledge and skill for standard cultivation • Lack of knowledge and availability of soil testing • Lack of knowledge and access on high-end/large buyer
Opportunity	**Threat**
• High level of employment • Nationwide year round high demand of different vegetables • Introduction of irrigation service • Opportunity of developing local service provider especially women • Potential to improve income • High end buyers like *Agora* and *Shopno* are purchasing fresh and good quality vegetables from farm-gate at better market price	• Flash flood • Late Rain

3.1.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that vegetable farmers face/ or have, underlying causes of those problems/ constraints, existing service weaknesses, and also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like lack of knowledge on improved production practices, lack of access to different services and lack of access to large buyers/ high-end buyers, this can be a potential value chain for Sylhet regions which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing vegetable value chain include- facilitate the dissemination of information on proper cultivation technique, facilitate linkage with extension service providers (DAE); DAE can be also linked with input companies during capacity development or promotional activities, facilitate linkage with improved seed and pest management service providers; facilitate them in providing embedded services. If suggested interventions can be undertaken by the project, this value chain can enhance household income, nutrition level of family members and improve condition of women and disadvantaged groups.

Problems	Constraints	Underlying Causes/ Service Weaknesses	Suggested Interventions
• Low yield • Low profitability	• Lack of knowledge on improved production practices (improved seeds; soil quality; use of inorganic and organic fertilizers; natural pest management techniques, post-harvest technologies) • Lack of knowledge on high-end/ large buyer demand (desired product quality and other specifications)	• Limited coverage of extension services (DAE) • Lack of access to extension services (DAE) • Lack of promotional activities by agro-input companies (like farm family meeting or prescription through their market development or sales forces) • Lack of demand pulls activities by large/ institutional buyers on desired product quality and other specifications • Absence of development actor/NGO led capacity development/ support activities	• Facilitate linkage with improved seed and pest management service providers; facilitate them in providing embedded services • Facilitate linkage with high-end forward market • Establish farmer groups to promote collective sales (aggregation; bulking) and purchase behavior • Develop local service providers (LSP) who might act as an information/ behavioral change hub; S/he also can (women can be involved here) • Develop commission agents/ collectors and link them to high-end forward markets; they can aggregate farmers produce, sell those to high end buyers in better price and simultaneously enjoy a commission from these sales • Facilitate linkage with extension service providers (DAE); DAE can be also linked with input companies during capacity development or promotional activities • Facilitate the dissemination of information on proper cultivation technique Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with farmers' demand • Facilitate linkage with soil-testing services; relevant local LSPs can also be developed
	• Lack of access to different services including finance, improved seeds, soil testing, and natural/ improves pest management services.	• Lack of access to appropriate financial product/ services that match particular value chain production cycle demands • Unavailability of quality Inputs in nearby market because of low demand from local farmers • Lack of access to soil testing services (at present by DAE) • Soil-testing services provided by DAE is time-consuming • Unavailability of natural/ improved pest management technologies in nearby market because of low demand from local farmers	
	• Lack of access to large buyers/ high-end buyers which results in farmers selling their produce in local markets in lower price	• Lack of access to large buyers/ high-end forward market channels • Farmers are not producing according to large buyer/ high-end buyer demand specifications	

3.2 CAPTURED AND DRY FISH VALUE CHAIN ANALYSIS

3.2.1 Background

Fisheries now play a major role in nutrition, employment and foreign exchange earnings. Fish alone supply about 60% of animal protein and about 1.4 million people are directly employed by the fisheries sector. About another 11 million people indirectly earn their livelihood out of activities related to fisheries. Fish can be divided into two boarder categories: 1) cultured fish and 2) captured fish. The discourse of value chain will revolve around captured fish and dry fish for the purpose of this report. The reasons for selecting this value chain is primarily its ability to generate income, employment, and involvement of women, youth, and disadvantaged people.

3.2.2 Product Analysis

The captured fish and dry value chains have almost similar value chain steps/ processes involved, except that dry fish value chain has some post-harvest processing steps involved. Dry fish just needs a few more steps to be processed. The value chain is simple since it does not have an extensive input market. The main problem in this value chain is that the *mohajon* leases out all the water land and the fishermen have little space/provision to catch fish. An industrial waste, and other man-made hazards are affecting fish ecosystem and biodiversity significantly Nevertheless, the fishermen still are holding on to this profession as they do not have any other alternative option.

- **Season:** The main season for catching fish is from *Agrahayan-Falgun*. In these months, the availability of captured fish increases.
- **Input purchase**: The fishermen buy the net and boat from the market.
- **Fishing**: Then they fish in the *haor* areas. Some of them get the lease from influential people to fish in water bodies. One person can catch 3-4 KGs of fish every day on average, which amounts to be around BDT 200-250.
- **Categorizing**: Fisherman grades the fish in terms of quality. If the quality is good, the fish is set for selling. The rest of them are dried or consumed.
- **Dry fish processing**: After categorizing the low-quality fish, they process it for drying. They use *tripal,* bamboo, salt and other accessories to dry the fish. They make shade where they put the fish for processing. 1 kg. dry fish is produced from 4 kg.of fresh fish. The whole process of producing 1 kg of dry fish takes about 3 to 4 months to complete and costs around BDT 2000-3000. One main problem in this procedure is the infestation of insects with the dry fish.
- **Selling**: The fishermen sell their fish to *mohajon*, from whom they take loan before fishing season. Additionally, they also sell fish to *foriyas*, who make BDT 10-15 profit per kg.

Selling price of captured fish

Name of the Fish	2015	2014	2013
Veda	400	300	250
Puti	100	85	70

Chengri/Lati	400	350	250

Work Allocation

The activities performed in the value chain and the respective actors are outlined below:

Activity	Actor
Taking credit	Fisherman
Input purchase (boat and net)	Fisherman
Categorizing	Fisherman and his females of the household
Dry fish processing	Female of the household
Selling	Fisherman

Participation Status of Women in the Value Chain

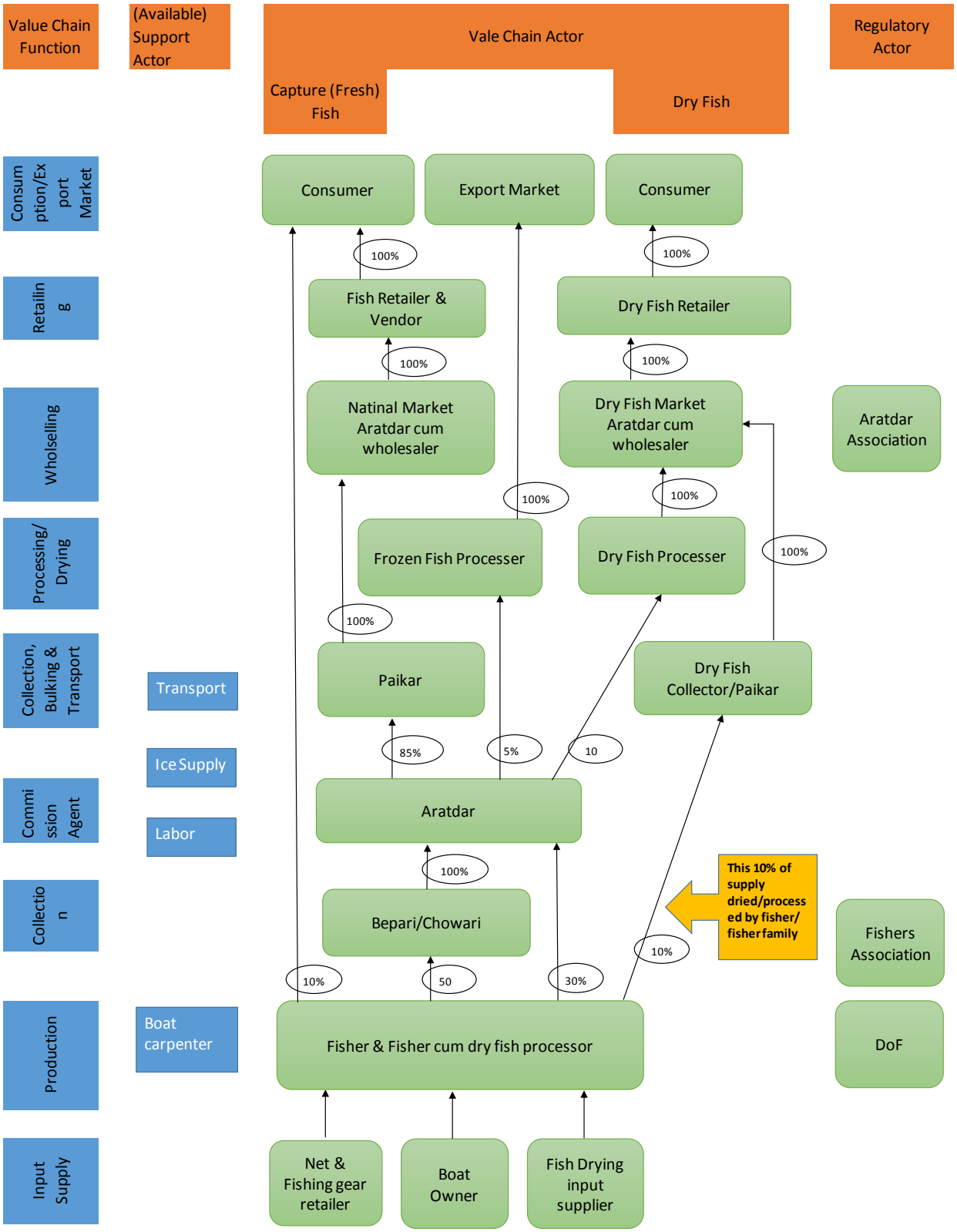
It was found that women work at home to support their male counterparts in drying or processing fish. They receive the remaining fishes from their male counterparts (low graded/ low price fish that were not sold in the market). They grade, sort and clean the fish according to the variety and quality. Then they mix salt to them and keep them where the sunlight directly falls. However, due to different social barriers, women are not usually involved in the other parts of the value chain (like in capturing or sales).

Cost and Benefit Analysis

Type	Explanation	Unit	Rate	Cost
Boat		1	6000	6000
Net		5-7 KG	3000	15,000-21,000
Dry fish processing input				2,000-3,000
Transportation				200

In the peak season of fishing, on an average they get BDT 200-250 in each day after deducting all expenses.

3.2.3 Captured and Dry Fish Value Chain Map



3.2.4 Input and Service Market Analysis

Inputs (boat, net and fish drying materials): Inputs used for fishing can be categorized into two broader groups– 1) boat and 2) nets (traditional and current net). The fisherman buys the boat and net from the input market. A village usually has 4/5 input markets where inputs are always available and accessible. The boat market sits for *Joishtho-Bhadro* only. The fisherman buys the inputs by cash or credit. They usually buy the boat after cultivation of paddy. A medium size boat costs about BDT 6,000. The net costs around BDT 3,000 per kg. A fisherman usually needs 5-7 kgs. of net to catch fish. Therefore, the total cost for net is in BDT 15,000-21,000 range.

Ordinarily, the fishermen use the current net because it guarantees larger quantity of fish. Using the legal nets does not ensure that. However, the current net is illegal. Therefore, there is always a risk of getting caught by the law enforcing agencies. Therefore, in spite of the risk of getting caught by the police, they use the current net. Additionally, there is always a risk of getting boats and nets getting stolen. In this case, the fisherman ends up buying boats and nets two or three times in a season.

For the processing of dry fish, the fisherman uses t*ripal,* bamboo, shed, salt and other accessories. These inputs are available and accessible all year.

Financial Services: The fisherman can take a loan from *mohajon* individually or collectively. The *Mohajon* acts as an enabling environment when he loans out money to him. Both parties engage in a mutual contract that outlines the terms and conditions of the loan. For example, in exchange for BDT 2-3 lakh loan the fisherman will sell all his fish in less price to the *mohajon*.

Although MFI has been a major actor in providing loan, their products have weekly installment system. Moreover, these systems do not consider particular fishing seasons or fisherman demand like boast or nets as credit products.

3.2.5 Output Market Analysis

A fisherman usually sells 40-50% of his total captured fish. He usually sells these to *Mohajon* since by that time they already get involved in an agreement. They sell their fish to him by BDT 10 less than the market price. Additionally, they have options of selling their fish to *arotdaars* for better price. An *arotdaar* usually has 4/5 *Forias*, to whom the fisherman sells his fishes as well. The *Forias* makes BDT 10-15 profit.

An *arotdaar* then sells the fish to Dhaka markets (Abdullahpur, Sayedabaad, Jatrabari). He does not deal with dry fish because selling raw fish is more profitable. He also has to incur some operational costs in order to sell them. He then transports them to Dhaka markets, for which he needs a vehicle with ice and containers for fish. He then sells the fish with BDT 20-30 profit per kg. There is also a fish processing company in Sunamgonj, where aarotdars supply 20% of their total purchased fish. The selling price of fish actually depends on the Dhaka market and the processing company.

Major Market Channels

Fishermen use different output market channels to sell their produce, and here are some major/more prominent market channels used by fishers

Raw Fish	
Channel – I	Fisherman – Consumer
Channel - II	Fisherman – Aratdar – Paikar – National Market Aratdar cum Wholesaler – Retailer – Consumer
Channel – III*	Fisherman – Bepari/Chowari – Aratdar – Paikar – National Market Aratdar cum Wholesaler –Retailer – Consumer
Channel - IV	Fisherman – Bepari/Chowari – Aratdar – Processing Company- Export Market
Dry Fish	
Channel – V	Fisherman – Aratdar – Dry Fish Processor – Retailer – Consumer
Channel – VI*	Fisherman (Own processing) – Collector/Paikar– Aratdar cum Wholesaler – Retailer – Consumer
Channel – VII	Fisherman – Aratdar – Dry Fish Processor – National/ Distant Market Aratdar – Retailer – Consumer

3.2.6 Enabling environment

Public Bodies: Some of the fishermen got a card for boats and nets assistance, for which they never got any service. Furthermore, National Fish policy is not properly followed by anyone. The policy states, "Government owned khas ponds and other water bodies will be leased out on long term basis to the poor and interested fishers/ trained jobless youths". Despite the outlined rules and regulations, water bodies go under the control of politically influential and financially affluent people.

Presence of development actors: Currently no NGO is working in fish value chain development.

3.2.7 SWOT Analysis

Strength	Weakness

• Availability of fish in the river • Dry fish is easily saleable	• Lack of knowledge and practice • Fish transportation problem to Dhaka • Less production of dry fish due to deceasing fish production. • Damage of the quality of dry fish by insects • No collective initiation in terms of processing and selling
Opportunity	**Threat**
• High market demand for fish and dry fish round the year • High-end buyers and super shops like Agora and Shopno are purchasing fresh and good quality fishes • Storage and processing facilities • Opportunity of gender inclusion • Collective production of dry fish	• Extensive leasing is making a scarcity of water lands • Sylhet is a cloudy region which hampers the processing for dry fish • National level fish policy is not properly followed • Excessive extraction of fish • Use of poison at the time of fishing • There is an underlying risk of using current net. Law and forcing agencies can catch them; they cannot use the usual one because it does not catch that many fish

3.2.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that fishermen are currently facing. The problems extend out to the respective underlying causes and existing service weaknesses. Additionally, the fourth column suggests some promising interventions that the project should undertake against the constraints and service weaknesses.

If relevant interventions can be taken against constraints mentioned below in the table, captured and dry fish could be a potential value chain for Sylhet region. The problems include lack of access in water bodies, reduced income from dry fish processing, and lack of obedience to the national rules and regulations. It would increase income of the poor, especially of women and disadvantaged people. Recommended mediations for this value chain include but are not limited to- encouraging proper implementation of national policy, promoting collective lease by local fishermen, and creating awareness on fishing policy and regulations. They also include facilitation of training on capacity development of women regarding new fish drying procedures and technologies. If suggested interventions can be undertaken by the project, this value chain can improve the conditions of women and disadvantaged groups hence boost household income.

Problems	Constraints	Underlying Causes	Interventions
• Fishermen do not have proper	• National fishing policy	• Influence of politicians and local	• Advocacy of proper implementation of national policy

access to local water bodies • Low earnings from fish drying	is not properly followed • Lack of awareness on fishing policy	musclemen; they lease out most of the water bodies • No extension service available to educate the fishermen on national fishing policy	• Promotion on collective lease by local fisherman • Creation of awareness among fisherman on fishing policy and regulations • Facilitation of training or capacity development of women on modern fish drying processes and technologies • Collective dry fish production initiation; • Development of local collectors/ commission agents • Advocacy work to change the mindset towards fish processing • Facilitation in developing female group to produce/ process dry fish • Enabling linkage with appropriate financial services; • Development of relevant financial products on credit basis
• Low quality of dry fish	• Lack of knowledge on fish drying procedures • lack of collective practice in fishing and sales activities	• lack of knowledge about the technologies and practices for modern fish drying processes • Lack of knowledge about the benefit of collective approach	

3.3 LEMON VALUE CHAIN ANALYSIS

3.3.1 Background

Lemon is a sour tasted fruit which grows all over Bangladesh especially in Sylhet, Chittagong Hill Tracts, Chittagong, Rajshahi, and Moulovibazar. The country's total lemon production amounts to almost 56,000 tons per year. Lemon grows well in tropical climate. It is grown in well-drained soils and warmest area of the landscape that does not flood (or remain wet) after typical summer rains. Also, long time drought is damaging for lemon cultivation.

Lemon is consumed as a fresh fruit alone or a complement to meat dishes. It is also used as processed food like pickles, squash, syrup, jelly, dessert, fruit salad, jam, yogurt, ice cream, and candy. Additionally, lemon is used as a crucial ingredient in various food items like vinegar, alcohol, citric acid, calcium citrate and so on. Lemon has is very beneficial to health and hence recommended for patients and health conscious people.

The women and youth involvement consists of around 20-30% in the value chain. The participation usually happens in weeding, plantation and harvesting phases of production.

3.3.2 Product Analysis

The indigenous people of Srimongol are immensely involved with lemon cultivation. There are different types of lemons available. Regionally the lemon grown in Srimongol is known as the Kagoji variety. The discussion for this project is largely based on conversations with the lemon farmers (mostly Khasia population group of Doluchora village of Srimongol) and other stakeholders.

Seasonality

The main season of lemon is the monsoon season (*Ashar-Srabon*). Usually a farmer uses his traditional knowledge and skillsets in order to grow lemon. He can cultivate lemon throughout the entire year provided that irrigation is available. Prevalent varieties include Hilly Kagoji (50%), China (40%), Jara (5%), Aada, colombo and others (5%).

Production Steps:

- The farmer digs a hole in the ground
- Then he puts pesticides in the hole (TSP, Urea, Phosphorus)

- He plants the sapling in a slanted way so that it leans towards the sun. If a farmer wants a successful cultivation of 100 lemon trees, he needs to plant at least 120 saplings. If the sapling comes from a big branch, the plant will grow faster. It is supposed to grow about 1.5 in two months. The plant needs to be straight and stiff. In order to ensure the stiffness, a log needs to be installed.
- After that, the farmer cleans and clears out the plant area at least three times during the season. Additionally, he puts pesticides and hormones as needed in order to prevent the plant from common diseases. Some of the diseases are die back, skanker, skab (regional names).
- Lemons do not grow in the first year. The yield starts from the second year and most yield happens at the third year. After they grow, the farmer along with his wife pluck them and categorize them in three groups (good, medium and bad) in terms of quality.
- The farmer's wife cleans the lemons.
- The farmer rents a van or pickup for transportation of plucked lemons. Then he goes to the market to sell.

Work Allocation

Labor is usually hired from family. The small farmers dig the holes and their family members help them plucking the lemons. As for the post-harvest process, farmers only categorize the lemons in terms of their quality and clean them before selling. There is no packaging or any other processing activities involved.

Activity	Actors Involved
Buying the fertilizers and insecticides	Farmer (husband)
Digging holes	Farmer (husband) and in some cases, hires outside labor
Planting the saplings	Farmer (husband)
Applying fertilizer and pesticides	Farmer (husband) and in some cases his wife
Watering	Farmer (husband)
Plucking	Both
Cleansing	Wife
Selling	Farmer (husband)

Cost and benefit analysis

Expenditure for Production for one year

Items	Explanations	Price	Unit	Cost
Sapling	A farmer needs 120 saplings in 1 bigha	20	120	2,400
Fertilizer	Fertilizer is put in every plant.	20	120	2,400
Labor	Labor is hired for creating holes for plants. One person can dig 20 holes in a day.	10	120	1,200
Insecticides	Insecticides are applied once a year.			1,000
Cleaning	In one season, a farmer needs to clean and clear out 3 times.	2,000	3	6,000
Bamboo log		15	150	2,250
Transportation Cost (Van fare)		200	75	15,000
Municipality Tax				50
Arotder Commission				3,000
Total				**33,300**

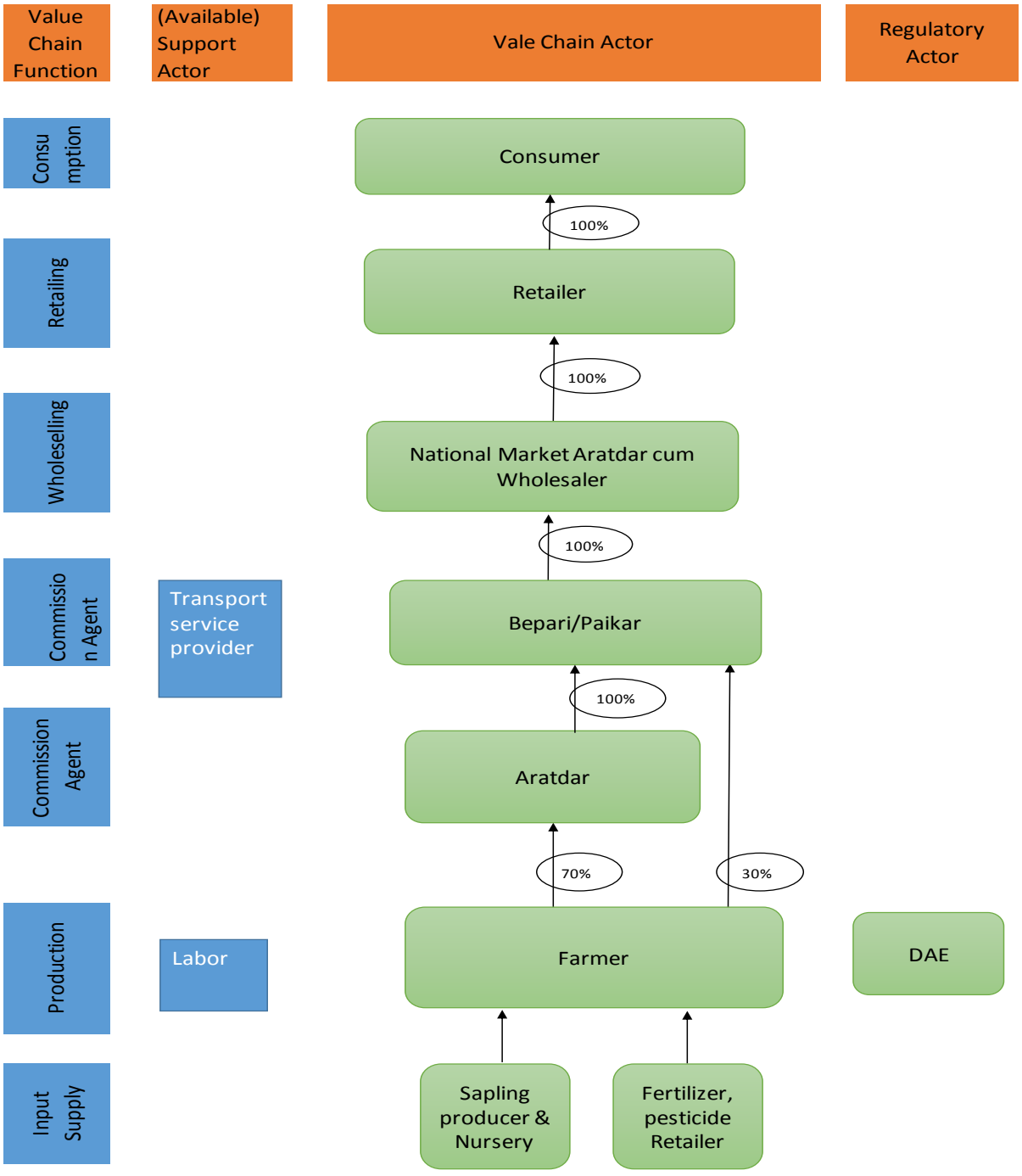
Sales and profitability

Since lemons start to grow in the second year, the revenue will start coming from the second year as well. Generally, on average, the plants bear around 500 lemons in the second year and about 750 in the third year. So, in the second year from 100 lemon trees in 1 *bigha* a farmer can get 60,000 lemon

No of trees	Lemon in one year	Price per lemon	Total sales
100	500	BDT 2.5	BDT 1,25,000

Total Sales = BDT 1,25,000
Total Production Expenditure= BDT 33,300
Total Profit= 1,25,000-33,300= BDT 91,700
Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 91,700/33,300=2.75

3.3.3 Lemon Value Chain Map



Value Chain Map of Lemon

3.3.4 Input Market and Service Sector Analysis

Inputs (saplings, pesticides and fertilizer): Inputs used in lemon production can be categorized into three boarder groups: 1) saplings, 2) pesticides, and 3) fertilizers. Lemon saplings (other than retained saplings) are collected from nearby nurseries and larger farmers at the rate of BDT 20.

Branded pesticides were found to be marketed by the permanent input retailers of the market. These are collected from Syngenta, ACI, Agro, Square and Auto Crop which are some of the leading pesticide brands in the region. Fertilizer is supplied by the private sector and the government (BCIC). Additionally, some farmers use organic fertilizer (compost). Among them urea is mostly used for lemon cultivation. The retailers also sell fertilizers, pesticides, vitamins, and other relevant agricultural inputs. Local input retailers usually make 10-15% profit in their business. Although they have the relevant knowledge, the input retailers want to attend various trainings and sessions in order to know more about the new technologies. Farmers can buy inputs from them which are always available. The quality of input is good and is evaluated based on farmer's feedback.

The input retailers deal the transactions with the farmer with cash or credit. 40% inputs are sold in credit. The rest of them are sold in cash.

Following tables show the general description of required inputs for lemon cultivation.

Type and price of Pesticide used by Farmers

Name of the Pesticide	Amount	Price
Cypermethrin	400 ml	440
Cloro Phimoxil	400 ml	450
Lemasyhelothin	500 ml	450

Type and price of Fertilizer used by farmers

Name of the Fertilizer	Amount in a Sack	Price of Per Sack
Urea	50 Kg	800
TSP	50 Kg	1100
Potash	50 Kg	700
Zipsum	10 Kg	250

Labor: Big farmers hire labor for digging and plucking activities. Per day wage of a labor is BDT 200 for male and BDT 130 for female.

Financial Service: There is no financial service available for lemon farmers.

Irrigation: Big farmers cultivate lemon in the offseason through the irrigation process. Getting water through pumping is very expensive and large farmers are Otherwise, a usual small farmer does not use the irrigation facility. He plants them in the monsoon season due to ample resource of rainwater. The location of the land is very crucial for small farmers. Since the irrigation facilities are not available for him, it is essential that the land is connected with a canal. If it is not connected to a canal, the source rainwater becomes limited.

3.3.5 Output Market Analysis

Lemon has a linear market as farmers bring their product to *arats* at Shrimangal station road and sell in the auction to *beparis* through *aratdar*. Beparis are inter-district or national lemon merchant. The *arat* commission is 5% on sales amount for all products. Sometimes *aratdar* provides advance or *dadan* without interest to farmers to ensure regular supply. Usually, farmers sell thrice a week. They bring large quantity to *arats* transported by jeep and sell to *beparis* through *aratdar*. For small quantity, they bring product early in the morning through pushing cart in a temporary market at station road and sell directly to *beparis*. There is a lack of access to forward market channels. This results in low product price and low producer incentive or investment amount in lemon cultivation.

Beparis collect products from Shrimangal and do packaging (gunny sack) according to various grade and transport to various outer market like kawran bazar. There they sell the lemons to another type of *aratdar* cum wholesaler. These wholesalers sell to retailers. Finally, the end consumers get the commodity from retailers.

Major Market Channels

Producers use different output market channels to sell their produce. Here are some major prominent market channels used by producers

Market Channels	
Channel – I	Farmer – Aratdar – Bepari/Paikar – National Market Aratdar cum Wholesaler – Retailer – Consumer
Channel - II	Farmer – Bepari/Paikar – National Market Aratdar cum Wholesaler – Retailer – Consumer
Channel - III	Farmer – Aratdar – Bepari/Paikar – Nearby District Market Retailer – Consumer

3.3.7 Enabling Environment

Infrastructure: Overall transportation and communication system is good. They can send their product easily.

Public Body: Some of the farmers received training from Upazila Agriculture office. Upazila administration plays a major role by leasing out the 'Tila' to lemon producer. Although, SAAO usually does not come to visit fields, the producers usually get support from the government bodies.

Presence of development actors: Currently no NGO is working in the lemon value chain development. Farmers are doing it on their own initiative.

3.3.7 SWOT Analysis

Strength	Weakness
• Contains high vitamin • Availability of inputs	• Lemon is a perishable product • Knowledge gap of scientific cultivation • Shortage of water in hilly area; improper irrigation system
Opportunity	**Threat**
• Nationwide high demand around the year • Introduction of irrigation service • Opportunity of developing local service provider • Availability of land	• Problem in excessive rain • Attack of disease

3.3.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that lemon farmers currently facing. It includes underlying causes of the problems/ constraints, existing service weaknesses, and the possible interventions that the project should undertake in order to lessen the constrictions.

As our findings suggest, if relevant interventions can be taken against constraints mentioned below, lemon can be a high potential value chain for Sylhet region. The constraints of this value chain include low production, environmental problems, low profitability, lack of irrigation facilities, probable fruit damage, and lack of knowledge on new technologies regarding production. It would increase income of the poor, especially of women and aboriginal people. Suggested interventions for developing lemon value chain include- facilitation of training or capacity development on scientific cultivation, facilitation of training or capacity development on post harvesting procedures, and facilitation of linkage with high-end forward market. If suggested interventions can be undertaken by the project, this value chain can boost household income, and improve condition of women and aboriginal groups.

Problems	Constrains	Underlying Causes	Interventions
• Low production • Environmental problem • Low Profitability	• Lack of irrigation facilities during dry season resulting in less production	• Srimongal is a hilly area, depends on mostly rainwater and all the lands are not close to cannels	• Facilitate access to irrigation services by providing pump and pipe • Facilitate training or capacity development on scientific cultivation and post harvesting procedure • Establish farmer groups to promote collective sales and purchase behavior • Facilitate linkage with high-end forward market
	• Sudden/ abrupt rain leads to fruit damage and losses; this results in low productivity and price	• All the farmers do not know the technique of keeping it safe from environmental effect	
	• Lack of access to knowledge on improved production processes, cost-effective technologies and management techniques	• Do not know about the technologies and practices of modern lemon cultivation process • Absence of development actors/ NGO led capacity development/ support activities	
	• Lack of access to forward market channels; and this results in low product price and low producer incentive or investment amount • Lack of collective approaches in sells • Women are only involved in labor-intensive activities	• Forward market is full of cunning people, as they are naïve hilly people so they sell it from their farm gate • Do not know the benefit of collective approach • Women's lack of knowledge on proper cultivation technologies, application, and disease management has directed them to work as a labor	

3.4 PINEAPPLE VALUE CHAIN ANALYSIS

3.4.1 Background

Pineapple is a sweet-sour tasted fruit which has ample amount of vitamins A, B and C. Pineapples abundantly grow in many districts, namely Tangail, Rangamati, Chittagong, Bandarban, Dhaka, Mymensingh, Khagrachari, Sylhet and Moulvibazar. Bangladesh has a world share of pineapple production of 0.8% with ranking of 22nd in the world. At least ninety varieties of pineapple are cultivated in the world. In Bangladesh, however, three varieties of pineapple are mostly grown. The three varieties are: Giant Kew, Honey Queen and Ghurasal. Total amount of production of Pineapple is 2,29,000 tons from 16,000 Hector land. Bangladesh is Tropical climate is better for Pineapple cultivation. Long time drought is harmful for Pineapple cultivation. Pineapple are found in a wide array of food stuffs such as- juice, can fruit ice cream and as fresh condition. Is also recommended as medical diet for certain diseased persons. Almost 20-30% of weeding, plantation and harvesting labor are women and youth.

3.4.2 Product Analysis

The indigenous people of Srimongol is immensely involved with Pineapple cultivation. There are different types of Pineapples available. Regionally the Pineapple grown in Srimongol is known as foreign variety (bilati jat). Following information is based on the discussion with Pineapple farmer (mostly Khasia population group of Doluchora village of Srimongol) and other stakeholders.

Seasonality

The main season of Pineapple is the monsoon season (*Ashar-Srabon*). Usually a farmer uses his traditional knowledge and practices in order to grow pineapple. He can cultivate pineapple throughout the entire year provided if irrigation is available.

Work Allocation

Labor is usually hired from family. The small farmers dig the holes and their family members help them plucking the pineapples. There is no packaging or any other processing activities involved.

Activity	Actors Involved
Buying the fertilizers, insecticides and hormone	Farmer (husband)

Activity	Actors Involved
Digging holes	Farmer (husband) and in some cases, hires outside labor
Planting the saplings	Farmer (husband)
Applying fertilizer and pesticides	Farmer (husband) and in some cases his wife
Irrigation	Farmer (husband)
Plucking	Husband or labour
Cleansing	Wife
Selling	Farmer (husband)

Cost and benefit analysis

Expenditure for Production for one year

Items	Explanations	Price	Unit	Cost
Sapling	A farmer needs 4500 saplings in 1 bigha	3	4500	13500
Fertilizer	Fertilizer is put in each plant.			4500
Land Preparation				12000
Insecticides	Insecticides are applied once a year.			1000
Cleaning	In one season, farmer needs to clean and clear out 3 times.			6000
Bamboo log		15	150	2250
Transportation Cost (Van fare)	van fare 200+			12000
Fruit Plucking		0.5	4500	2250
Municipality Tax				500
Arotder Commission				3000
Total				**57,000**

Sales and profitability

Since Pineapples start to grow in the second year, the revenue will start from the second year as well. Generally, in second year it grows 500 Pineapple which is 750 in third year in average. So, in the second year from 100 Pineapple trees in 1 bigah a farmer can get 60,000 Pineapple

Pineapple in one year	Price per Pineapple	Total sales
4500	BDT 22	BDT 99,000

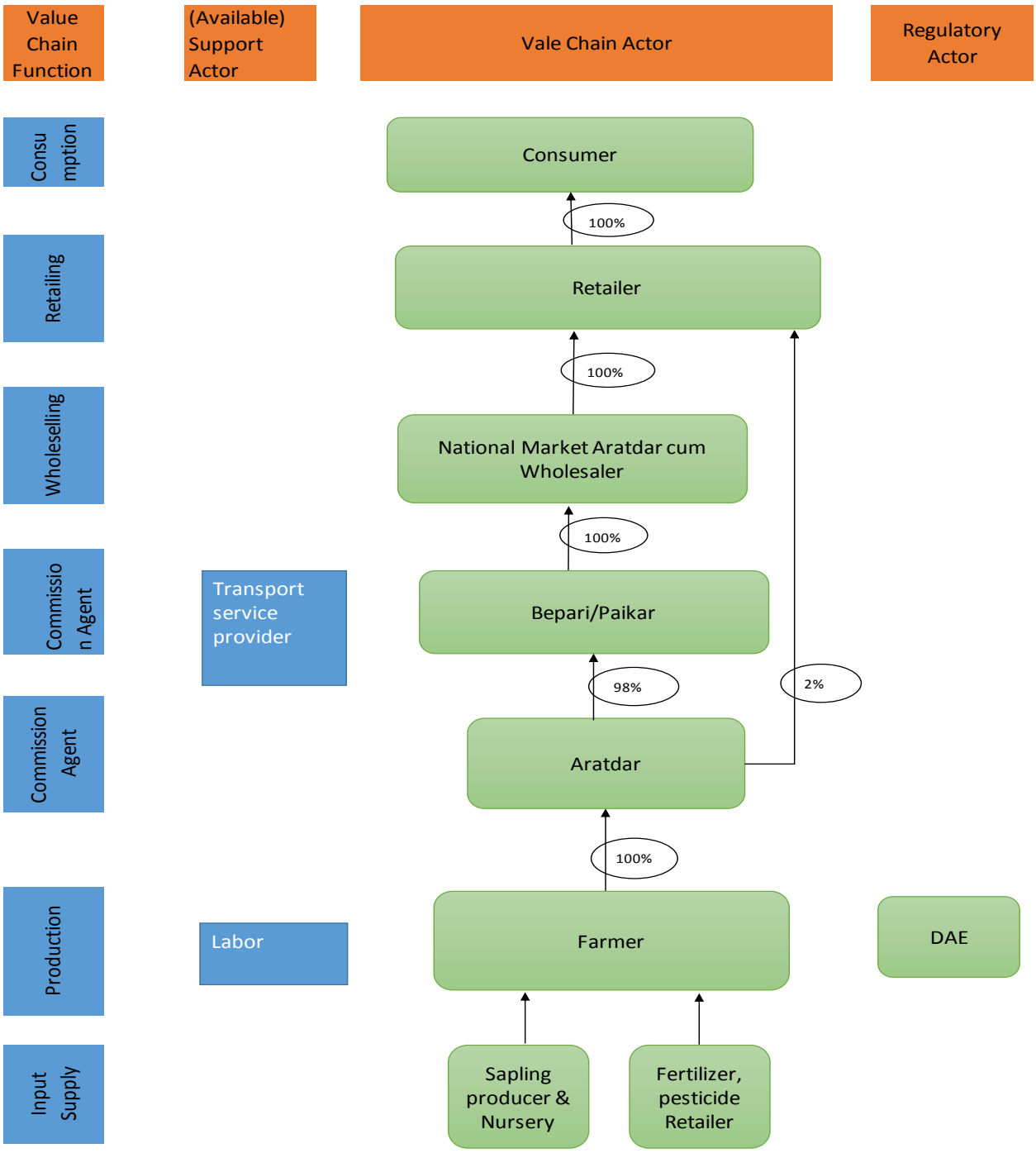
Total Sales = BDT 99,000

Total Production Expenditure= BDT 57,000

Total Profit= 99,000-57,000= BDT 42,000

Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 42,000/57,000= 0.74

3.4.3 Pineapple Value Chain Map



Value Chain Map of Pineapple

3.4.4 Input and Service Market Analysis

Inputs (saplings, pesticides and fertilizer): Inputs used in pineapple production can be categorized into four boarder groups: 1) saplings, 2) pesticides, 3) fertilizers and 4) hormone. Pineapple saplings (other than retained saplings) are collected from nearby nurseries at the rate of BDT 03. There is no major disease of pineapple. However, farmers use hormone for early production to catch the market before the season and get comparatively high price.

Branded pesticides were found to be marketed by the permanent input retailers of the market. These are collected from Syngenta, ACI, Agro, Square and Auto Crop which are some of the leading pesticide brands in the region. Fertilizer is supplied by the private sector and the government (BCIC). Additionally, some farmers use organic fertilizer (compost). The retailers also sell fertilizers, pesticides, vitamins, hormone, and other relevant agricultural inputs. Local input retailers usually make 10-15% profit in their business. Although they have the relevant knowledge, the input retailers want to attend various trainings and sessions in order to know more about the new technologies. Farmers can buy inputs from them which are always available. The quality of input is good and is evaluated based on farmer's feedback.

The input retailers deal the transactions with the farmer with cash or credit. 40% inputs are sold in credit. The rest of them are sold in cash.

Type and price of Pesticide used by Farmers

Name of the Pesticide	Amount	Price
Syphermethrin	400 ml	440
Cloro Phimoxil	400 ml	450
Lemasyhelothin	500 ml	450

Type and price of Fertilizer used by farmers

Name of the Fertilizer	Amount in a Sack	Price of Per Sack
Urea	50 Kg	800
TSP	50 Kg	1100
Potash	50 Kg	700
Zipsam	10 Kg	250

Type and price of hormone used by farmers

Name of the Hormone	Name of the Company	Quantity per container	Price

Promote	SARC	100 ml	BDT 150-180
Riphen	National Agri	100 ml	BDT 150-180

Labor: Big farmers hire labor for cultivation support especially in times of digging the holes for the saplings and to pluck the Pineapples. Per day wage of a male labor is BDT 200 which is 130 for female.

Financial Service: There is no financial service available for pineapple farmers.

Irrigation: Big farmers cultivate pineapple in the offseason through the irrigation process. Getting water through pumping is very expensive and large farmers are using it. Otherwise, a usual small farmer does not use the irrigation facility. He plants them in the monsoon season due to ample resource of rainwater. The location of the land is very crucial for small farmers. Since the irrigation facilities are not available for him, it is essential that the land is connected with a canal. If it is not connected to a canal, the source rainwater becomes limited.

3.4.5 Output Market Analysis

In the study area pineapple output market is almost similar to lemon as it placed in same physical market at Shrimangal. Interestingly those beparis who deal lemon don't get involved in pineapple business and vice versa. Farmers bring their product to aratdar at Shrimangal station road, and sell in auction to beparis through aratdar. Beparis are inter-district or national pineapple merchant. The arat commission is 5% on sales amount for all product. Sometimes aratdar provide advance or dadan without interest to farmers to ensure regular supply. Beparis collect product from Shrimangal and transport to various outer market like Badamtoli Arat at Sadarghat. Often retailers from nearest district market also purchase pineapple from Srimangal based Arots to sell in their local markets.

Major Market Channels

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Market Channels	
Channel – I	Farmer – Aratdar – Bepari/Paikar – National Market Aratdar cum Wholesaler – Retailer – Consumer
Channel - II	Farmer – Bepari/Paikar – National Market Aratdar cum Wholesaler – Retailer – Consumer

Channel - III	Farmer – – Aratdar Nearby District Market or Local Market Retailer – Consumer

3.4.6 Enabling Environment

Infrastructure: Overall transportation and communication system is good. They can send their product easily.

Public Body: Some of the farmers received training from Upazila Agriculture office. Upazila administration plays a major role by leasing out the 'Tila' to pineapple producer. Although, SAAO usually does not come to visit fields, the producers usually get support from the government bodies.

Presence of development actors: Currently no NGO is working in the pineapple value chain development. Farmers are doing it on their own initiative.

3.4.7 SWOT Analysis

Strength	Weakness
• Contains high vitamin • Availability of inputs	• Pineapple is a perishable product • Pineapple got rotten by the effect of rain water • Knowledge gap of scientific cultivation • Shortage of water in hilly area; improper irrigation system • Squirrel destroy pineapple
Opportunity	**Threat**
• Nationwide high demand around the year • Introduction of irrigation service • Opportunity of developing local service provider • Availability of land	• Excessive use of hormone • Problem in excessive rain and excessive sun shine • Attack of disease

3.4.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that pineapple farmers currently facing. It includes underlying causes of the problems/ constraints, existing service weaknesses, and the possible interventions that the project should undertake in order to lessen the constrictions.

As our findings suggest, if relevant interventions can be taken against constraints mentioned below, pineapple can be a high potential value chain for Sylhet region. The problems include low production, environmental problems, low profitability, lack of irrigation facilities, probable fruit damage, and lack of knowledge on new technologies regarding production. It would increase income of the poor, especially of women and aboriginal people. Suggested interventions for developing pineapple value chain include- facilitation of training or capacity development on scientific cultivation, facilitation of training or capacity development on post harvesting procedures, and facilitation of linkage with high-end forward market. If suggested interventions can be undertaken by the project, this value chain can boost household income, and improve condition of women and aboriginal groups.

Problems	Constrains	Underlying Causes	Interventions
• Low production • Environmental problem • Low Profitability	• Lack of irrigation facilities during dry season resulting in less production	• Srimongal is a hilly area, depends on mostly rainwater and all the lands are not close to cannels	• Facilitate access to irrigation services by providing pump and pipe • Facilitate training or capacity development on scientific cultivation and post harvesting procedure • Establish farmer groups to promote collective sales and purchase behavior • Facilitate linkage with high-end forward market
	• Sudden/ abrupt rain leads to fruit damage and losses; this results in low productivity and price	• All the farmers do not know the technique of keeping it safe from environmental effect	
	• Lack of access to knowledge on improved production processes, cost-effective technologies and management techniques	• Do not know about the technologies and practices of modern pineapple cultivation process • Absence of development actors/ NGO led capacity development/ support activities	
	• Lack of access to forward market channels; and this results in low product price and low producer incentive or investment amount • Lack of collective approaches in sells	• Forward market is full of cunning people, as they are naïve hilly people so they sell it from their farm gate • Do not know the benefit of collective approach • Women's lack of knowledge on proper cultivation technologies, application,	

Problems	Constrains	Underlying Causes	Interventions
	• Women are only involved in labor-intensive activities	and disease management has directed them to work as a labor	

3.5 HAND STITCH VALUE CHAIN ANALYSIS

3.5.1 Background

Hand stitch is an old art tradition in Bangladesh mostly practiced by craftswomen. As a statement of style and fashion, hand stitch has huge popularity in the form of 'Nakshi katha' or embroidered quilt, bed-sheet, women and men fashion wear, not only in Bangladesh but also in abroad. In recent years, a good number of rural or urban poor, divorced or underprivileged women have got self-depended successfully through ornamental hand stitching. Jessore Sadar, Jhikorgacha, Monirampur upazila of Jessore district and kaliganj of Jhenaidah has a long tradition of hand stitch renowned as 'Jessore Stitch'. Women in these areas with their inherited skill and aesthetic sense make different products like - nakshi katha, cushion cover, wall mat, sharee, hand bag, three pieces, Panjabi, Fatua etc. Year-round demand from end user and large volume of work before two eid seasons for hand stitch products made the scope for poor and underprivileged women to take it as their secondary profession.

This study found major issues related with hand stitch are capacity enhancement of craftswomen regarding quality improvement, latest fashion and color combination. Addition to this, business and financial management of hand stitch business is also important.

3.5.2 Product Analysis

In the study area at Monirampur in Jessore, craftswomen mentioned that they have basic skill and mostly do consumer or end users order based business. Nakshi katha, cushion cover and bed-shit are prevalent products produced by them. Usually they receive orders directly from end users and through women's welfare organization or cooperative societies. During eid season, craftswomen receive orders of hand stitch work on women's and men's wear from middlemen of fashion houses. In case of delivering orders of end users or fashion houses, craftswomen just play the role of craft laborer or artisans. In spite of long tradition of producing hand stitched crafts and fashion wear, craftswomen of

the study area do not have their own outlet.

Many of these craftswomen rely on tailoring as their first profession along with regular household activities. The skills are satisfactory, but they still do not have knowledge of modern fashion trend, fabric and color combination. The products also lack in standard quality. Few women have received training in this regard provided by various development project.

Constraints: Hand stitched products are not regular commodity rather fashion or style item which has a good demand and marketing opportunity through social media. But craftswomen of the study area neither have any own initiative nor linkage with social media based entrepreneurs. Lack of access to these information and financial services bared them to grow entrepreneurship attitude.

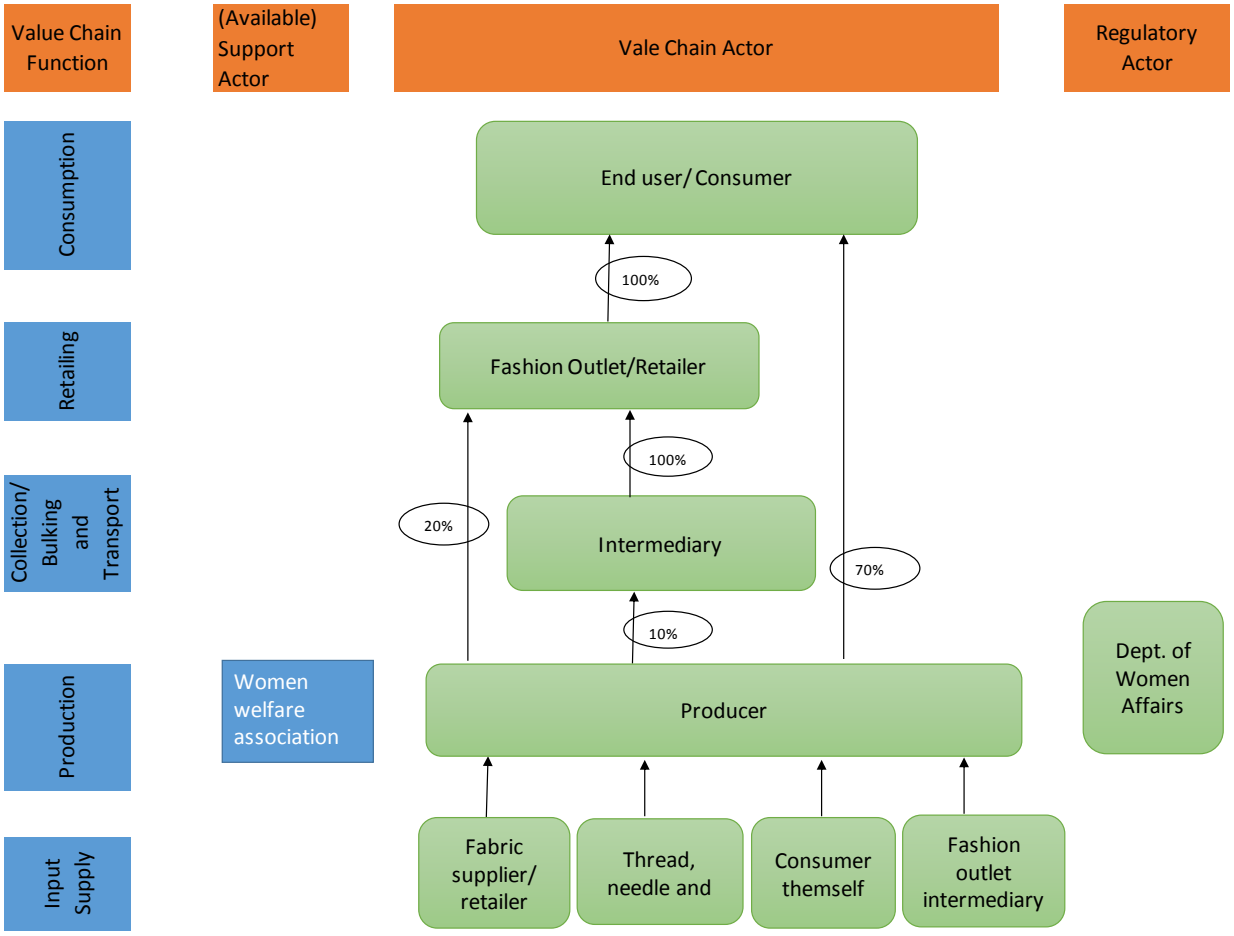
Cost and Benefit Analysis:

Most of the rural women have the inherited skill of hand stich and can start their business at home by receiving order. In case of direct order from end user, they provide fabric and thread. When the order comes through the group, craftswomen get inputs from the respective group. In average a craftswoman need to work 3-4 hours per day for one month to make a double size bed-sheet with medium sized designs. She can earn BDT 2500-3500 as her wage from that work. Their income increases two to three folds in occasions like Eid.

Participation Status of Women in the Value Chain

The hand stitch sector is almost fully employed by women except for input supply. Production and selling to customers are entirely done by women, even fashion outlet or output retail shop has also higher women employment. Male members of the family often support craftswomen by assisting in household chores as their income ultimately contributed to the family. However, hand stitch paves the way of self-dependency for a large number of rural and urban poor housewives, divorcees, unemployed young girls, adolescents, students, widows and disadvantage group of people.

3.5.3 Hand Stitch Value Chain Map



3.5.4 Input and Service Market Analysis

Inputs: Major inputs used in the hand stich value chain are- fabric, sewing thread, needle and frame, and so on. All the inputs are available in local market. In the case of a direct order from end user craftswomen usually need not buy any input, rather consumers themselves are input provider. They often get orders through women welfare association or cooperative society. These associations procure fabric directly from Islampur, Dhaka-based wholesalers and give those to craftswomen. Like end-consumer, fashion house middleman also provides all types of inputs like fabric and thread to them. Local grocery shops are the usual input source for thread, needle and frame used for hand stitch.

Women Welfare Association: Women welfare association works as a connecting agent between producers and clients. Usually, they are pro-producers and occasionally they provide training.

Financial Service: Craftswomen usually do not take any credit support from any bank or MFIs for business development, although loans are available. However, NGOs has been a major actor

in providing loan, but their products have weekly installment system and do not consider particular crafting season or producer demand.

Local Service Providers: There is a scope of introducing local service provider (LSP) who will check the quality of the finished goods and look after design, product development and training. Some other services like over-locking embroidery service by automated machine, washing and calendaring service also needs to be introduced.

3.5.5 Output Market Analysis

In the assessment area, previous customers and people referred by them are the only forward market clients for hand stitch products. Most of the customers are local people living in that area or abroad. Sometimes export of hand stitch product also happens through such consumer based informal channel.

During festivals like eid, workload increases as they receive the order from fashion houses through intermediaries or middlemen. There are some prominent fashion houses like Aarong run by BRAC, Charka run by Jagoroni Chakra Foundation who sell hand stitch products produced by their beneficiary members. They export products to many countries like UK, USA, Italy, Japan, France, and so forth. Department of Women Affairs has an outlet in Dhaka named Joyeeta, but local craftswomen have lack of access to that outlet as Joyeeta offers installment payment and selective procurement.

Major Market Channels

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Market Channel – I	Producer – Consumer
Market Channel – II	Producer – Intermediary/middleman– Fashion Outlet/ Retailer – Consumer
Market Channel –III	Producer – Fashion Outlet/ Retailer – Consumer

3.5.6 Enabling Environment

Public Body: The local office of Department of Women Affairs has infrastructures like training centers, but lacks resources like trainers and fund to train the women.

Presence of Development Actors and Women Welfare Association: Currently several NGOs and women welfare associations are working on hand stitch and women economic empowerment. Some NGOs like BRAC and Jagoroni Chakra Foundation (JCF) have been working on hand stitch product value chain development. They run some production centers through their beneficiaries. Usually, they provide designs sent to field through a group leader. After sewing, group leader collects the product from the field and sends back to production center. Washing and quality control are maintained by the production center that sends to

showrooms or for export after final checking. They also provide necessary training to its group members to develop their skill regularly.

3.5.7 SWOT Analysis

Strength	Weakness
• Mostly labor intensive and require almost no capital except skill • Inherited skill and traditional practice • Comparatively high-value and fashion or style product • High scope of involvement of women and adolescent girls	• Often products quality fail to meet high value market demand • Lack of linkage with any formal forward market • Lack of proper business management and planning • Access to outlet of Joyeeta
Opportunity	**Threat**
• Product development and diversification • Quality improvement by providing training • Export potentiality for additional income • The scope of linkage with social media based entrepreneur • Presence of brac and Jagoroni Chakra Foundation as a client and mentor • The scope of linkage with large input seller like fabric arats based in Baburhat, Narsingdi or Sirajganj.	• Intrusion of low price machine embroidery substitutes • No guarantee of regular purchase order from client • Risk of natural disaster like water logging in Monirampur upazila of Jessore disrupts production

3.5.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that fishermen currently face/have. The problems extend out to the respective underlying causes and existing service weaknesses. Lastly, the fourth column suggests some promising interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- lack of knowledge on modern production techniques, lack of access to appropriate financial product/services, unavailability of local mechanical/ technical service providers, lack of access to forward market channels, tailoring business can be a potential value chain for Jessore district which would increase income of the women. Suggested interventions for developing hand stich value chain include- facilitate training service provisions through public and private sector on product development and diversification and develop LSP to provide quality enhancement service like over-locking embroidery by automatic machine, washing and calendaring. If these can be undertaken by the project, this value chain can enhance income, involvement of the poor and improve the condition of women.

Problems	Constraints	Underlying Causes	Intervention Needed
• Low profitability • Low productivity	• Lack of knowledge on modern production techniques (quality control, color combination, latest fashion and other specifications)	• Lack of training and support service by local Department of Women Affairs (DOWA) office as they have resource (trainer etc.) limitations.	• Facilitate training service provisions through public and private sector on product development and diversification
	• Lack of access to appropriate financial product/services that much particular value chain production demand	• Development actor/NGO led capacity development/ support service is not prominent	• Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers' requirement
	• Unavailability of local mechanical/ technical service providers	• Volume of the production is not that much to become someone for full time service providers; providing service as part time business	• Develop LSP to provide quality enhancement service like over-locking embroidery by automatic machine, washing and calendaring
	• Lack of access to forward market channels • Lack of entrepreneurship attitude and business management knowledge	• Lack branding or promotion of product which might get more customer attention • No prior commercial or business orientation • Lack of access to ICT and social media based business initiative • Lack of access to DOWA's forward market initiative 'Joyeeta' as they procure in the credit system.	• Facilitate linkage with high-value product and export market • Facilitate linkage with social media based entrepreneur • Facilitate entrepreneurship to producer community

3.6 CRAB VALUE CHAIN ANALYSIS

3.6.1 Background

Crabs are valued greatly throughout coastal regions due to their high demand in export market. The crabs, which grow wild, are caught along the coasts of Sundarban, brought down to farm level for fattening, and are sold at local markets at handsome prices. Right now, 18.26% of the total coastal population depends on crab fattening as major source of livelihood.

Until now, 50 species of crabs have been identified in the coastal habitats of the Bay of Bengal, among which 11 are marine species. Mud crab or mangrove crab is commercially important and is widely available in Sundarban mangrove areas. Bangladesh exported BDT 3.5 billion worth crab in 2013-14 FY, according to EPB. Every year, an average 375 MT of crabs are collected from mangrove areas, 70% of which are used as crablets or crab seeds.

3.6.2 Product Analysis

Considering the increasing demand of crab mostly in the international market along with marginal local market, crab fattening has been gaining popularity among the coastal communities. In the study area at Burigoalini union of Munshignaj upajila in Satkhira, we found that producers are using plastic cage for 'Hard Shell Crab' fattening. This practice is supported by the government of Bangladesh under 'Innovation in Public service' project. Government has provided 2 *bigha khas* land, logistics, especially plastic cages, and information service to the community for crab fattening. Producers use single cage for each crab as this species has acute cannibalistic character to eat or injure each other. Crab fattening is also common in mud pond but harvesting is difficult in that case.

Crab fattening can be done around the year, but during winter production decreases. Fatteners or producers feed tilapia to their crabs. Hard shell crabs are exported as live species. We have also found 'Soft Shell Crab' farm been operating by large producers who rear crabs until they change their shell and do freezing for export. Crab fattening requires water change facility in regular interval. So, it is convenient to place cages in close water bodies adjacent to canal or river to easily control water flow through sluicegates.

Cost Benefit of small farmer (at Munshiganj, Shyamnagar, Shatkhira) using cage technology

Crop: Crab, land size-33 decimal, production period: 1-1.5 months

Fixed Cost Items	Cost (BDT)	Remarks
Land lease value		Supported by Govt.

Cage	162500	2500 cages, BDT 65/piece

Inputs	Cost (BDT)	Remarks
Crablet (SM grade crab)	50000	About 250 kg contains 2500 crablet, each kg prices BDT 200 on average (fully subsidized by upazila administration in the study area)
Tilapia as feed	6300	10gm fish for each crab @ 42tk./kg. Crab also take its left shell which reduces feeding cost
Lime	250	Used for water purification
Fertilizer	200	
Binding Tap	200	

Sales and profit

Average production in one month	Average Price of per kg	Total sells
1000 kg	500	500,000

Total Sells = BDT 5,00,000

Total Production Cost= BDT 56,950

Total Benefit= 5,00,000-56,950= BDT 4,43,050

Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 4,43,050/56,950=7.78

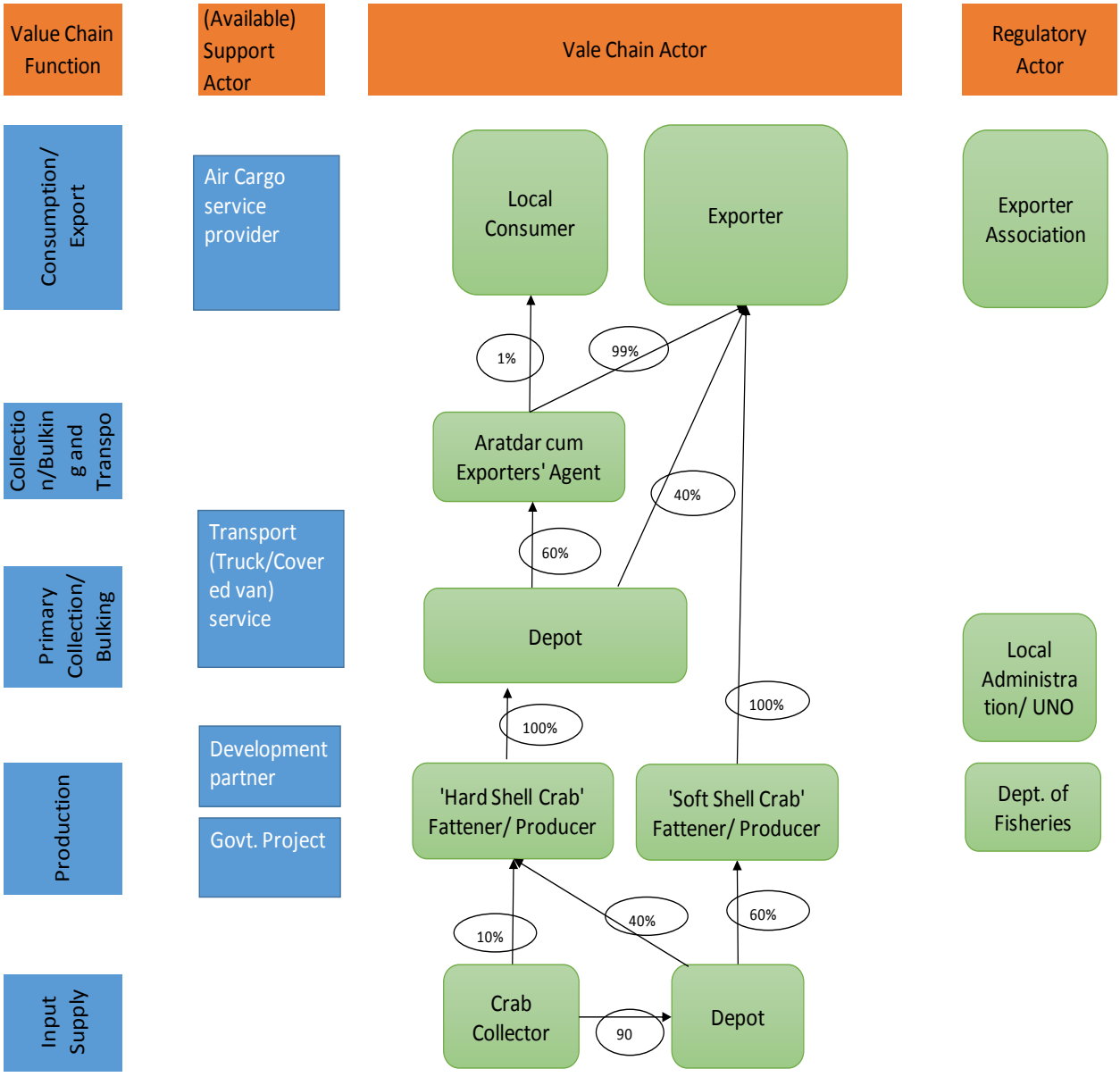
The above-mentioned cost benefit analysis based on ideal practice of stocking all the crablet at a time. In the study area farmers are used to stock more inferior grade crablet like 'PS' and do gradual harvesting of mature male crabs in a regular interval when their shell get hard. Farmers grow female and hijra crab for few more times like additional 15-30 days to get their ovary full with egg and these crabs get higher price.

Participation Status of Women and Disadvantaged in the Value Chain

In the study area, we have interviewed people from an indigenous tribe and found high involvement of women. They are involved in all stages of crab production like prepare cages and stocking crablets, feeding and regular monitoring. Women involvement is also high in harvesting and post harvesting (tying claws with tap) which poses risk of being injured or cut by crab. Therefore, a large number of women, children and adolescent girls of coastal community are involved in crab collection from natural sources.

There is a government program regarding livelihood development of small indigenous community, has been implementing by local administration especially UNO office and Upazila fisheries office. Local indigenous people who are one of the disadvantaged group of people and mostly depend on the resources of Sundarban are being involved in crab fattening under that project.

3.6.3 Crab Value Chain Map



** Depot mentioned in the value chain actually same entity and played a dual role here*

3.6.4 Input and Service Market Analysis

Inputs: Crablets or crab seeds are the major inputs for crab fattening, abundantly found in Sundarban mangrove areas. They also exist in large number in shrimp ponds and in the burrows of the peripheral dikes, but it's not an established source of input. In the study areas, it was observed that the crab collectors collect various grades' crabs from the canals or rivers of Sundarban forest and sell most their collection to local depots. Crab fatteners or producers usually buy input from depots but sometimes they procure small crabs or crablets from collectors also.

Another vital input for cage crab culture is the plastic cage. This item is not yet available in local market but few plastic industries like RFL provide such cage to producers through their distribution channel. Other input items like tilapia fish as feed, binding tap, lime and fertilizer are available in local market.

Labor: In the study area crab producers employ self and family labor for crab cultivation and often exchange labor help with neighbors for fish or other crop cultivation.

3.6.5 Output Market Analysis

The price and demand of crab is higher in winter season, when the catch is minimal. Price of female crab is higher than that of the male. In spite of crab fattening practice a large volume of exportable crab come from natural sources. In the study area, we found 5 grades for the male crabs as XXL, XL, L/M, SM and SSM, whereas 4 grades of female crabs as F1, F2, F3 and Kh-1 all are in descending order of live gross weight. The marketing channel involved a series of actors involving the fattening farmer/collector, depot, or large *aratdar* cum agent and exporter.

Major Market Channels

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Hard Shell crab (produced by small farmer or collected from wild source)

Market Channel – I	Farmer – Depot – Exporter
Market Channel – II	Farmer – Depot – Large Aratdar cum Agent – Exporter
Market Channel – III	Collector – Depot – Exporter
Market Channel – IV	Collector – Depot – Large Aratdar cum Agent – Exporter

Soft Shell crab (produced by large scale commercial farmer)

Market Channel – V	Producer – Exporter

3.6.6 Enabling Environment

Infrastructure: Overall road and communication system is good. Crab is transported from farmers' end to arat through rickshaw van. Truck is the common mode of transport to send the

commodity from local depots to large arat like Devhata in Shatkhira or directly crab exporter. Crabs are being exported as live products and exporters use air cargo for that.

Public Body: Upazila administration in association with upazila fiseries office has initiated a project of cage crab fattening under 'Innovation in Public Services' funded by the Prime Minister's Office of the government of Bangladesh.

There are some service providers recruited under government funded 'National Service' scheme who provide necessary information service to producers. They also help producers in grading their products for selling and inform regular price update received depots.

Presence of development actors: NGO or development project was evidenced in the study area have been working on capacity building of shrimp farmers and developing local service provider who are the main change making agent of this value chain.

Environmental Impacts

Crabs are naturally saline tolerant and therefore it offers greater opportunity to take it as their livelihood around the year. But over exploitation of natural resources to meet the increasing demand in soft shell carb fattening might have endanger the biotic and ecological balance.

3.6.7 SWOT Analysis

Strength	Weakness
• Higher demand of Crab in export market • High profit margin in short period of time • High resistance against virus and disease attack and low mortality • Easy availability of inputs • High scope of women inclusion	• Collectors depend on nature for collecting inputs • Crab has cannibalistic character and often one eat or break another's leg which make that rejected for export. It's a major setback regarding quality issue. • Frequent pirate attacks in the forests • Lack of knowledge of crab fatteners on farm management resulting low and poor quality yield • Lack of access to finance limiting investment on Crab farming.
Opportunity	**Threat**
• Adoption of Modern Method • Increasing production of standard crab • Exploring feasibility to develop crab hatchery • High growth potential and it's increasing day by day • Opportunity of gender inclusion	• Collection of crab from natural source is becoming over exploited • Pirates attack on crab collectors in the Sundarban area • Increasing level of salinity

- Climate resilient value chain

3.6.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that producers face/have, underlying causes of those problems/constraints, existing service weaknesses, and also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- dependency on nature for inputs leading overfishing of crablets, increased risks (tiger, pirates, and so on) associated with crablet catching making the collectors vulnerable, lack of access to water bodies for poor or marginal farmers and lack of access to knowledge on farm management, improved production processes, cost-effective technologies and management techniques this can be a high potential value chain for Sylhet region which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing crab value chain include- facilitate research and development on crab hatchery, introduction of cage cultivation of crab, facilitate training service on scientific crab fattening. If suggested interventions can be undertaken by the project, this value chain can improve the condition of women and disadvantaged groups as well as enhance household income in a great extent.

Problems	Constraints	Underlying Causes	Interventions
• Low volume of yield • Often fails to meet the quality standard of export market	• Dependency on nature for inputs leading overfishing of crablets	• Absence of crab hatchery	• Facilitate research and development on crab hatchery • Facilitate linkage with law enforcement agencies like police and coastguard to ensure safety issues • Facilitate linkage with government bodies to ensure access to open water bodies • Introduction of cage cultivation of crab • Facilitate linkage with appropriate financial services; products • Facilitate linkage with direct export market
	• Increased risks (tiger, pirates, and so on) associated with crablet catching making the collectors vulnerable	• Presence of pirates and hijacking of forest goer if they do not give their demanded money	
	• Lack of access to water bodies for poor or marginal farmers	• Most of the water bodies are under the belt of big *gher* owner	
	• Lack of access to knowledge on farm management, improved production processes, cost-effective technologies and management techniques	• Lack of proper financial service, targeting small crab fatteners. • Lack of development project/NGO private sector regarding	

		training and product development	• Facilitate training service on scientific crab fattening

3.7 SHRIMP AND CULTURED FISH VALUE CHAIN ANALYSIS

3.7.1 Background

Shrimp is an important fisheries resource in the national economy of Bangladesh. It is considered as an exportable item. Each year it shares about 2.75% of the total export earnings of Bangladesh. There are two production zones for shrimp, the southern region and the Chittagong region. The southern region contributes about 70% of the total shrimp production (55,513 mt) of Bangladesh (BBS 2010-11). Khulna district is one of the major production areas of Shrimp. According to the Fisheries statistical yearbook of Bangladesh (2012-13), published by Department of Fisheries, 52639.07 ha land of Khulna district is used for shrimp production the annual production of shrimp is 26138.29 MT.

A percentage of cultured shrimp is locally consumed, but a major portion of the production is exported. It is the second largest export item of Bangladesh after readymade garments. These are mainly exported to the European Union countries. Unfortunately, Bangladeshi exporters often cannot comply with foreign buyers' requirements regarding quality and traceability. This issue is related to diminishing selling prices. The production cost is high along with the absence of quality (post larva) PL. Additionally, high incidence of diseases is making shrimp culture gradually unviable for small farmers.

3.7.2 Product Analysis

In Rupsha upazila of Khulna, the whole *gher* is used for cultivation of shrimp and fish during the rainy season. However, during dry seasons trenches inside the *gher* are used for shrimp and fish culture and rice is planted in the central plot. In the study area, every year farmers dry their *gher*, bring out the sludge, and apply rotenone powder, lime and fertilizer as pre-stocking management.

Farmers in the study area prefer wild/natural sources of post larva (PL) and mostly stock PLs into the *ghers* in the month of February-March. At first, they do nursing of PLs for one month in enclosed area of the *gher* and feed wheat flour and nursery-feed. After that, they do final stocking in the whole *gher*. Farmers usually stock 3000-5000 PLs per *bigha* and often this is done over several separate stockings, by several weeks apart. Farmers also grow white fish in *ghers*, but they have to be careful not to grow fishes like mrigel, shoil, taki, tengra, puti, and so on. White fish

fries are collected from *patilwala/patil* parties. Different types of feeds are used for shrimp and white fish like ready feed, snail muscle, and so on. Shrimps are very prone to various diseases and virus attacks like white spot, soft shell, tail rot disease et cetera. Farmers use various aqua chemical or pro-biotic, lime and medicine along with supplementary water supply by shallow machine.

Growth patterns differ among male and female shrimps as females grow more slowly so farmers generally do not harvest the whole *gher* at one time. To get high return, they do multiple selective harvests of the large blue-claw males every lunar cycle. Then they do the final harvest at the end of ninth or tenth months (usually in October-December).

Cost Benefit of Farmer (at Rupsha, Khulna)

Crop: Shrimp (Golda) and Carp fishs, land size-33 decimal, production period: 9-10 months

Inputs	Cost (BDT)	Remarks
Gher Preparation	10000-12000	Labor cost
Post Larva (PL)	12000-15000	3500 PL
Fingerling	1000-2000	500 pcs
Nursery & Pellet Feed	25000	BDT 1200 per sack of 40 kg
Snail Muscle (as feed)	10000	Each sack costs BDT 600 including the labor cost
Rice bran	2000	
Fertilizer	1000	
Lime	1000	
Medicine/Aqua Chemical/Pro biotic	2000	Use 2-3 times
Water supply	1000-1200	Use occasionally
Harvesting/Fishing gear and labor	2000-3000	
Production Cost	**74,200**	

Sales and profit

Average production in one year	Average Price of per kg	Total sells
White Fish 240 kg	BDT 100	24,000
Galda 160 kg	BDT 700	1,12,000

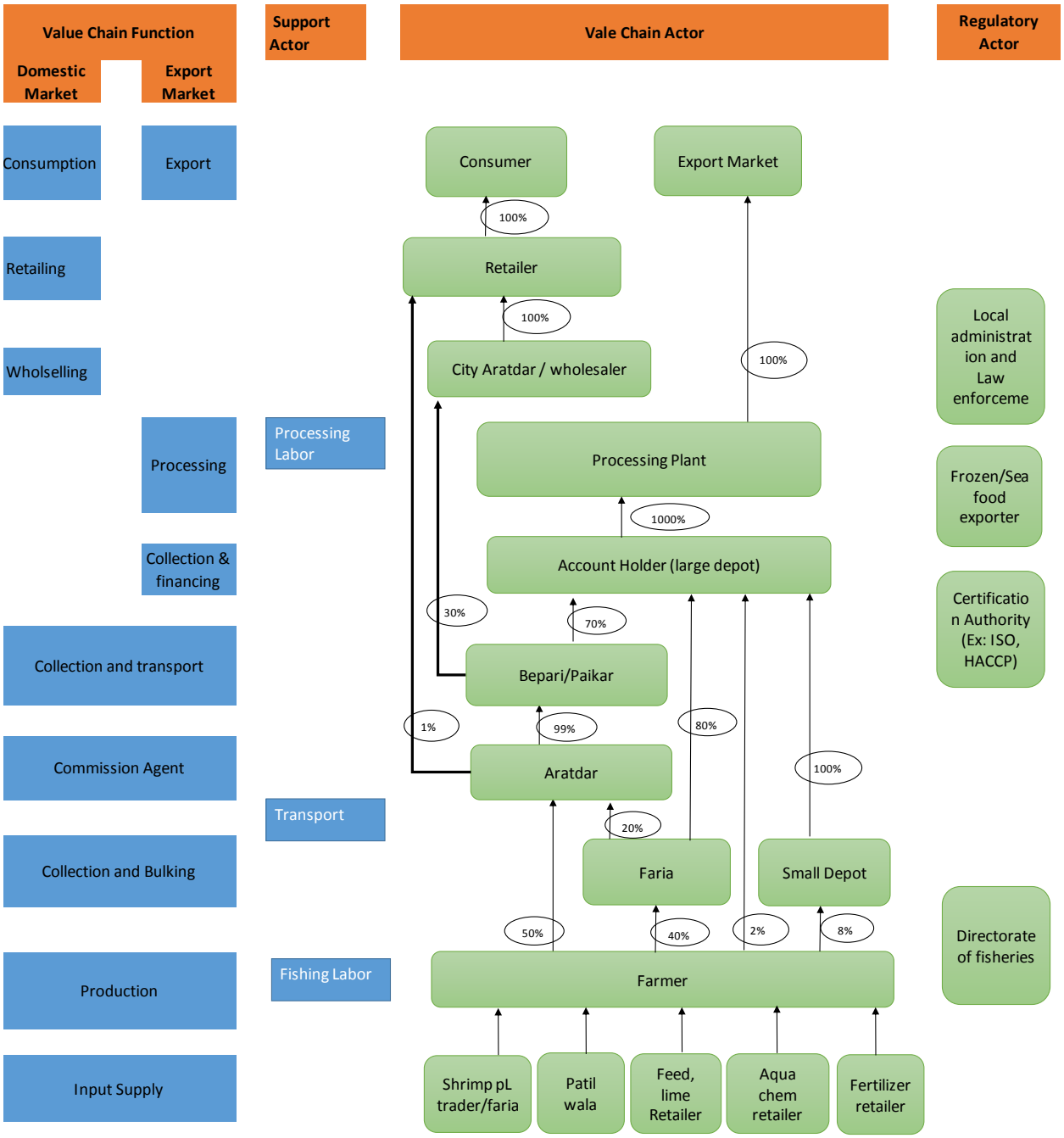
Total	1,36,000

Total Sells = BDT 1,36,000
Total Production Cost= BDT 74,200
Total Benefit= 1,36,000-74,200 = BDT 61,800
Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 61,800/74,200= 0.83
Constraint: From the field study, it was identified that shrimp culture requires land/*gher* resource which is difficult to manage for poor or marginal people. In the study area, farmers usually culture shrimp in own land/*gher*. *Gher* can also be rented but the lease value is high as farmers usually pay the cost after harvesting the shrimps.

Participation Status of Women in the Value Chain

In Rupsha, we found that women work at home to support their male members in farming fish. They feed the shrimp and fish in gher nearby their house. We didn't find much involvement of women in any other roles except providing labor for extracting snail muscle and cultivating vegetable in gher dike. Social barrier is definitely the major reason for women not being in the position. But interestingly southern region especially Khulna, Satkhira and Jessore area are more liberal regarding women's role beyond household chores. As the society does not encourage women to be involved in regular income generating activities so they are not financially much sound but they have good technical knowledge on shrimp culture inherited from their male counterpart.

3.7.3 Shrimp and Cultured Fish Value Chain Map



3.7.4 Input and Service Market Analysis

Inputs (PL, feed and other aqua chemical): Inputs used in shrimp and cultured fish production can be distinguished into three broader groups– 1) post larva, 2) feed, and 3) other aqua chemicals. In the study area of Ghat para union of Rupsa upazilla, farmers usually buy PLs from nearest Alaypur market. There the PL traders bring naturally collected galda PL. It was also observed, that natural and hatchery PL are collected mainly from Foyla, Rampal and Foltita markets through traders. The *patilwala/patil* parties bring white fish fingerlings from the hatcheries and nurseries and take those to the doorsteps of the farmers.

Other important inputs for shrimp culture are feed and aqua chemicals. Farmers bring feed or aqua chemical from there nearby markets in Alaipur, Kazdia, Samantasena or Foltita market. Aqua chemical, medicine, vitamin, hormone or animal health care products are available and input retailers are the main embedded information service provider who prescribes necessary aqua chemicals and medicine for shrimp.

Irrigation: There is no problem of irrigation on that area and sufficient shallow machine and irrigation service providers are available there.

Labor: Big farmers hire labor for cultivation support especially in times of catching shrimp and fish.

Ice: As it is a shrimp and fish export oriented area so there are sufficient amount of ice factories and they are supplying according to the need of the producers.

Shrimp culture require high price inputs like PLs and external feeding so lack of capital is another important problem for the poor stakeholders. The other problems associated with lack of access to quality input especially PL. Diseases management along with non-scientific culture methods by farmers is the problem caused by lack of access to knowledge on modern and standard culture practice. Lack of access to financial service or product is another cause behind the exclusion of poor people in shrimp culture or production.

3.7.5 Output Market Analysis

In Bangladesh shrimp market has a complex but well established system comprising various value chain actors. These actors are involved with various services like collecting, auctioning or transportation. The output market starts from the shrimp farmers who usually sell major portion to farias and rest to beparis through aratdars. Some NGO or development project promoted farmers' groups directly sell their products to depot owners. On the other hand, farias purchased 100% shrimp from shrimp farmers and they sold 80% to depot owners and rest to beparis through arats.

In the study area in Rupsha upazila farmers prefer to sell their shrimp to beparis instead of depot owners or farias. Because they receive better prices from beparis through arats at nearest Shiyali market or Foltita market at Bagerhat where more than 150 business entities trade fish, shrimp, and prawn. Arats facilitate the sales for 3-4 percent commission by auctioning and providing

some embedded service like weighing and grading. Shrimp price determined by its grade and size.

Bepari purchases fish from *faria* via *aratdar* and sold 80% to depots and rest to the national market through various district or city *arat*. Another type of *aratdar* operates in city markets or trading zones like kawran bazar in Dhaka and receives fish from the *beparis/paikars* (wholesalers) and through second time auctioning, sell to retailers.

Depot owners sell their entire collection through account holder depot to exporting farms/processing plant who export the entire amount to abroad. The accountholders are the key stakeholders in the financial system of the supply chain. Small depots and *farias* use the accounts of large depots to sell their products to the processing factories or exporters. In this case, the accountholder take a commission from the sales value from the processing plant. Accountholders generally sell to exporters on credit while accountholders purchase products from their suppliers mostly in cash. They are very influential in the value chain and determine price.

Market System Dynamics

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Export Market

Market Channel – I	Farmer – Aratdar – Bepari – Account Holder – Processing plant – Export Market
Market Channel - II	Farmer – Depot owner – Account Holder – Processing plant – Export Market
Market Channel - III	Farmer – Faria – Aratdar– Depot owner – Account Holder – Processing plant – Export Market

Domestic Market

Market Channel - IV	Farmer – Aratdar – Retailer – Consumer (Local market)
Market Channel - V	Farmer – Aratdar – Bepari/Paikar– City Aratdar – Retailer – Consumer (National market)

3.7.6 Enabling Environment

Infrastructure: In the study area, overall road and communication system is good. Shrimp and fish transported from farmers' end to arat through engine van or *nosiman*. Truck is the common mode of transport to send the shrimp and fish from arat to frozen food processing factory or national market.

Public Body: Upazila DoF office often provides training to lead farmers on shrimp culture but that is not sufficient as many farmers has no formal training on scientific or standard shrimp culture and quality assurance issues.

Presence of development actors: NGO or development project was evidenced in the study area have been working on capacity building of shrimp farmers and developing local service provider who are the main change making agent of this value chain.

Environmental Impacts

Shrimp cultivation especially 'Bagda' poses some serious environmental risks of soil salinity, water salinity, scarcity of drinking water, loss of agricultural land and grazing land and destruction of mangroves. Therefore, over exploitation of natural or wild post larva of shrimp risks reduction of aquatic resources and bio-diversity.

3.7.7 SWOT Analysis

Strength	Weakness
• High profit margin • Availability and easy access to forward market	• Lack of access to vital resource *'gher'* for poor or marginal people. • Limited scope of women inclusion • Prone to virus and disease which may sometime risk entire production or investment • Shrimp cultivation requires comparative high investment for extensive care and feeding management which is difficult for marginal farmers to manage
Opportunity	**Threat**
• High international market demand • Integrated vegetable cultivation on *gher* dike • Reduction in cost of production • High growth potential • Climate resilient	• Environmental degradation by culturing saline water shrimp *'Bagda'* • Adulteration by pushing gel or other materials into shrimp exploits the reputation in export market and diminishing sales price

3.7.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that shrimp and cultured fish producers face/have, underlying causes of those problems/constraints, existing service weaknesses, and also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- lack of access to water bodies like *gher*, requires high investment, lack of knowledge on proper integrated cultivation practice and disease (especially virus) management, lack of access to good quality low cost post larva (PL)/ fingerling, this can be a potential value chain for southern region which would increase income of the poor, especially of women and disadvantaged people. Suggested interventions for developing shrimp and cultured fish value chain include- facilitate access to quality input, facilitate linkage with appropriate financial services, and facilitate training/

capacity building on modern and standard cultivation practices and technologies. If suggested interventions can be undertaken by the project, this value chain can improve the condition of poor, women and disadvantaged groups as well as earn foreign revenue.

Problems	Constraints	Underlying Causes	Interventions
• Lack of access of water bodies for poor • Low yield	• Lack of access to water bodies like *gher*	• Most of the water bodies are under the belt of wealthy *gher* owner	• Advocacy work on proper implementation of national policy and collective lease by local poor stakeholder • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with shrimp and fish producers demand • Facilitate access to quality input • Facilitate access to collective approach or group approach in cultivation and sales • Facilitate training/ capacity building on modern and standard cultivation practices and technologies • Develop producer group as well as collection point
	• Shrimp cultivation requires comparative high investment for extensive care and feeding management which is difficult for marginal farmers to manage	• Lack of proper financial service, targeting small shrimp and fisherman	
	• Lack of knowledge on proper integrated cultivation practice and disease (especially virus) leads to sudden mortality resulting low production and price • Lack of access to good quality low cost post larva (PL)/ fingerling	• Presence of virus • Absence of sufficient no of hatcheries in the catchment areas and distance of hatcheries is far resulting lack of quality PL • *Bagda* shrimp farmers prefer PL from natural source and that has no quality assurance like hatcheries but natural source PL costs comparatively high like tk. 5/pc • *Patilwalas* bring white fish fingerling from distant hatcheries and farmers don't care much the quality as it is their secondary product	

3.8 MEDICINAL PLANT VALUE CHAIN ANALYSIS

3.8.1Background

Medicinal plants can be defined as a group of plants used for medicinal purposes. According to the World Health Organization (WHO), "A medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes, or which are precursors

for chemo-pharmaceutical semi-synthesis." The WHO estimated that by 2020 the global herbal medicine market would be valued about USD 3 trillion and local market demand in Bangladesh valued about BDT 3.3 billion per annum.2 But few years back there was no systematic cultivation process of medicinal plants in Bangladesh. In recent years, the growing demand for herbal products by pharmaceutical companies has led to grow various medicinal plants in many areas of Bangladesh especially hilly area of Chittagong, Mymensingh, Madhupur of Tangail, Polashbari and Sadar upazila of Gaibandha and Laxmipur of Natore district.

3.8.2 Product Analysis

Traditionally medicinal plant sector has occupied an important position in the herbal medicinal arena of Bangladesh. The World Health Organizations (WHO) enlisted some 21,000 species as medicinal plant and in Bangladesh, about 500 species have been identified as medicinal plant.3

In the study area at Mohdipur union of Polashbari upazila in Gaibandha, it was found that majority of the medicinal plants growers have limited cultivable land resources. Bashok, Tulshi, Ashwagandha, Sorpogondha, Swarnalata and Kalomegh are the most prevalent medicinal plants in that area. Initially a cooperative society named 'Seba Prodankari Somobay Samity' supported by a development project has formed producer groups in 2009. Since that time farmers have been growing Bashok in roadside and fallow land borrowed from union council with the help of a cooperative society. An adult tree can produce 4 kg green leave equivalent to 1.5-2 kg dry leave in a 2-3 months' interval. Farmers are used to grow Tulshi and Kalomegh in arable land along with fallow land. They plant Tulshi and Kalomegh seeds in Bengali Boishakh and harvest the entire plant in Ashwin-Kartik month. Ashwagandha needs to be grown only in arable land and its cultivation time is Kartik-Chaitra.

For Tulshi, Kalomegh and Ashwagandha cultivation farmers till the land by traditional plough and make bed. After that they use lime, cow dung and vermin compost before sowing seed and do weeding 2-3 times in cultivation period. Sometimes it requires supplementary irrigation. Any types of pesticide and chemical fertilizer are not used in medicinal plant production. After harvesting green leave or entire plant farmers dry them in shed. Farmers get about 20 kg dry leave and plant of Tulshi or Kalomegh per decimal of land while Ashwagandha root production in one decimal land is 3 to 5 kg. According to the farmers, the market price of dry leaves of Bashok is BDT 37, Tulshi BDT 40, Kalomegh BDT 50 and Ashwagandha root BDT 300 per kg.

[2] http://archive.dhakatribune.com/commerce/2013/jul/06/bangladesh-can-tap-3tn-global-medicinal-plants-market

[3] http://bpc.org.bd/mphpbpc_sector_profile.php

Medicinal plant has good demand and better market price compared to other agricultural products but doesn't ensure round the year income. Marginal farmers need to grow other crop or do something else like day laboring beside medicinal plant cultivation for their livelihood.

Cost Benefit of Farmer

Crop: Ashwagandha, land size-10 decimal, crop period: 6 months

Items	Cost (BDT)	Remarks
Irrigation	300	Supplementary irrigation only.
Tilling	1200	Traditional plough tilling: 300tk*4times
Lime	160	2 kg per decimal of land
Cow dung	150	
Vermin Compost	140	It requires 20 kg compost for 10 decimal of land
Labor	900	1 external labor along with self-labor require3 times for weeding
Harvesting & Post harvesting		Mainly own and family labor
Total production cost (around)	**2850**	

Sales and profit

Average production in one season	Average Price of per KG	Total sells
30 kg	300	9000

Total Sells = BDT 9,000

Total Production Cost= BDT 2,800

Total Benefit= 9,000-2,800 = BDT 6,200

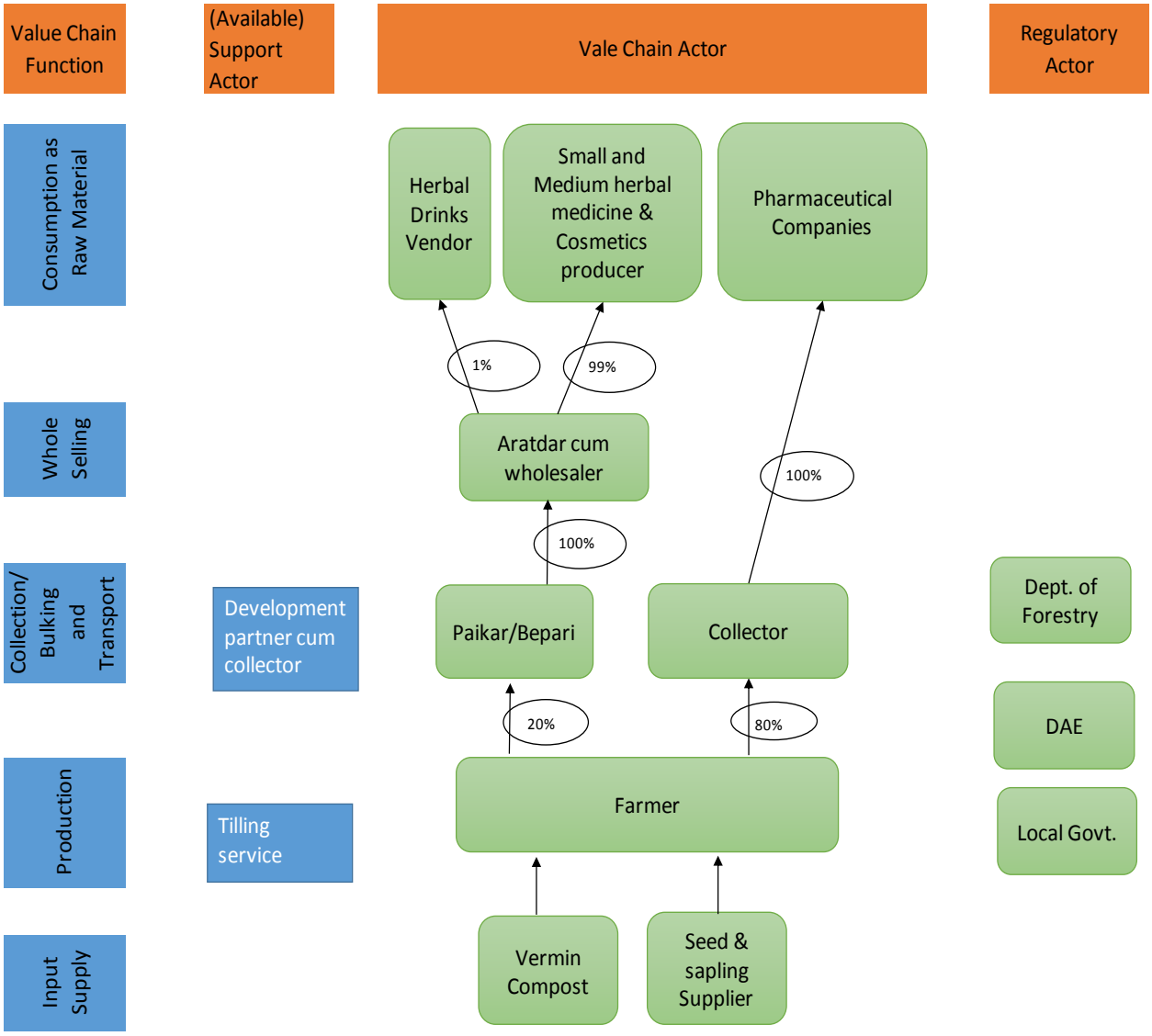
Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 6,200/2,800= 2.22

In the Study area, growing medicinal plant in borrowed fallow land is a collective approach. Sometimes group members are reluctant to participate in leaf plucking or harvesting as it takes much time comparable to the monetary value of return. Lack of group members' interest in collective work might have affect the total production.

Participation Status of Women in the Value Chain

Women has significant involvement in medicinal plant production. Plucking Bashok leave and post-harvest preparations like drying Bashok, Tulshi, Kalomegh, Swarnalta and Ashwagandha leave are mainly managed by women. But they perform those as a household member and mostly remain unpaid. Selling the output product in collection centre is managed by the male members of the family. However, adolescent members of the family remain involved in the process but they have potential for more involvement.

3.8.3 Medicinal Plant Value Chain Map



3.8.4 Input and Service Market Analysis

Inputs: The major input for the medicinal plant is the sapling. Many species of medicinal plant are native and grown in the wilderness in Bangladesh but commercial farming needs a regular supply of sapling and seed. Initially the 'Seba Prodankari Somobay Samity' a local cooperative society supported by a development project has distributed sapling to farmers groups in the study area at Polashbari, Gaibandha. Till they provide necessary information and training regarding medicinal plant cultivation.

Currently, farmers mostly use their retained seed for cultivating the medicinal plant. The cooperative society also provides saplings like Bashok for BDT 3 and Tulshi or Kalomegh for BDT 0.50 per pieces and for vermin compost as there is no formal source. Farmers use home or locally produced cow dung for cultivation.

Labor: In the study area farmers employ self and family labor for medicinal plant cultivation especially at the time of plucking. However, there is a collective approach of labor in this value chain.

3.8.5 Output Market Analysis

In the study area at Polashbari upazila in Gaibandha, the study team found a single market channel. There is a sole buyer, a pharmaceutical company procures medicinal plants at previously fixed rate through their selected output collectors.

A cooperative society cum output collector do the collection or bulking of medicinal plant items from farmers for a single pharmaceutical company. The output collector gets BDT 5 commission per kg from the pharmaceutical company.

There is a huge unmet demand for medicinal plants as pharmaceutical raw materials which currently fulfilled through import from India. Medicinal plant traders also reported about some discriminate farming of medicinal plants in different areas of Bangladesh. Paikars or beparis collect those items and supply to small or medium scale Ayurvedic/Herbal medicine producer or company and wholesalers mainly based at Moulavi bazar, Dhaka.

These wholesalers import medicinal plants in the category of herbs or spices and also purchase locally produced items through paikars or beparis. They supply medicinal plants as raw materials to various Ayurvedic/Herbal medicine producer, pharmaceutical and cosmetic company. Wholesalers sell few items like aloevera and ulatkambal to retailer or drinks vendor who sell their product to end consumer.

Market Channel

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Market Channel – I	Farmer – Collector – Pharmaceutical Company
Market Channel – II	Farmer – Bepari/Paikar – Wholesaler – Herbal Medicine/cosmetic producer
Market Channel –III	Farmer – Bepari/Paikar – Herbal Medicine/cosmetic producer
Market Channel – IV	Farmer – Bepari/Paikar – Wholesaler – Retailer/Drinks vendor

It is a monopoly market as there is a single buyer of medicinal plant in the study area which might be a potential risk. Few years back they stopped procuring from the farmers in quality issue, which totally hesitated the market system in that area. In such circumstance, farmer remain vulnerable. Sudden fluctuation of purchasing quantity and price by wholesalers and paikars destabilizes the market which lures farmers to sell once in high price instead of regular sales to pharmaceutical companies in comparatively low price.

3.8.6 Enabling Environment

Public Body: Ministry of Environment and Forest has a cell for medicinal plant development. They have been running a research center for medicinal plant, promoting Neem plantation and producing medicinal plant sapling through tissue culture. Department of Forestry maintains a medicinal plant garden of fifty seven species at the national park, Gazipur. The government has another initiative of selling various medicinal plants' sapling at a subsidized rate through 400 different government nurseries all over the country. But that facility is mostly availed by amateur medicinal plant gardener not for commercial farmers.

Union council or local govt. bodies are the major stakeholder of medicinal plant development. They lend or lease out roadside and fallow land for medicinal plant cultivation.

Presence of Development Actors: At Polashbari in Gaibandha medicinal plant cultivation has been initiated through a development project facilitated by an international NGO. Their local development partner, a cooperative society has provided training and necessary input support to producers and became the collector of output product which ensured sales.

Pharmaceutical Companies: Large pharmaceutical companies set some rules which mostly govern the medicinal plant production sector. They have a guideline regarding cultivation post-harvest procedure to ensure pesticide-free product with standard moisture content. Often companies provide training to producers and collectors on medicinal plant production. Therefore companies set farmers' selling price and commission of collectors and ensure regular demand.

Environment Impacts

In Bangladesh ecological and biotic factors are suitable for the cultivation of medicinal plants. Expansion of medicinal plants cultivation will protect them from extinction and help to conserve the biodiversity.

3.8.7 SWOT Analysis

Strength	Weakness
• Low cost and less labor intensive sector • Production in fallow and homestead land • Better price comparable to many agricultural products • Favorable ecological condition • High engagement of women and family labor • Huge and demandable plant range	• Lack of knowledge on potentiality of medicinal plant • Lack of access to fallow land • Lack of proper forward market linkage
Opportunity	**Threat**
• Huge national market demand or unmet need • Export potentiality • Scope of integrated farming • Diversified range of usage in medicine and cosmetics industry	• Competition with imported product • Monopoly market as the presence of only one pharmaceutical company

3.8.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that producers currently face/have. The problems extends out to the respective underlying causes and existing service weaknesses. Lastly, the fourth column suggests some promising interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- unavailability of proper input especially sapling or seed and lack of knowledge on demand and quality production, this will be a potential value chain for Gaibandha district. Suggested number of interventions for developing medicinal plant value chain include- form producers group and promote collective production of more high value plant, facilitate access to multiple large buyers or processors (e.g., pharmaceutical or cosmetics companies), facilitate linkage with improved sapling/seed and service providers; facilitate them in providing embedded services, facilitate training/ capacity development of producers on modern production practices and technologies.

If suggested interventions can be undertaken by the project, this value chain can improve the condition of poor, women and disadvantaged groups as well as improve the household income.

Problems	Constraints	Underline Causes	Interventions
• **Low yield** • **Lack of around the year income generation**	• Unavailability of proper input especially sapling or seed	• Absence of development actor/NGO led capacity development/ support service • Limited coverage of extension services (DAE)	• Facilitate linkage with improved sapling/seed and service providers; facilitate them in providing embedded services • Facilitate training/ capacity development of producers on modern production practices and technologies • Facilitate linkage with extension service providers (DAE); DAE can be also linked with input companies during capacity development or promotional activities • Form producers group and promote collective production of more high value plant • Facilitate access to multiple large buyers or processors (e.g., pharmaceutical or cosmetics companies) • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers requirement
	• Lack of knowledge on demand and quality production	• Training on modern production technologies is not available • Collective production unable to ensure better return. For example, by producing Basak leave collectively one can earn BDT 40-60 in two months, which make them reluctant in this approach	
	• Current production practice does not ensure around the year income rather producers get two times production in a year; therefore producers have low priority for this value chain sub-sector	• Medicinal plant culture is comparatively new to farmers and lack of knowledge on integrated farming with other crop or take it as an alternative income generation opportunity	
	• Lack of capacity to meet pharmaceutical companies increasing demand results presence of monopoly buyer and less competitive market	• Poor or marginal farmers have limited land and can't compromise basic food security item rice or potato cultivation for comparatively high value item medicinal plant	

3.9 WARM CLOTH/HOSIERY VALUE CHAIN ANALYSIS

3.9.1 Background

It is widely recognized that small and cottage or informal industries play important roles in creating employment opportunities and promoting the sustainable growth of the

economy. In the small and cottage industry sector of Bangladesh, hosiery or warm cloth weaving is an important part. According to local entrepreneurs, setting up hosiery factories at Kochashohor in Gobindaganj upazila started in the early seventies of last century with the initiative of a few local entrepreneurs. In course of time, the industry area expanded rapidly at the surrounding areas and worth BDT 200 crore.[4] Nearly 30 types of products like scarves, sweaters, cardigans, caps, socks etc. are made in these small factories. During the winter season worm clothes produced by them were highly demandable not only in local market but also by the rest of the country. Noyarhaat market at Kochashahar in Gobindaganj union is the main trading place for these warm clothes.

3.9.2 Product Analysis

In the study area at Kochashohor union of Gobindaganj upazila in Gaibandha, the study team found it is not even few years back when there were around 2,000 small and medium cottage industries spread in 50 villages of Gobindaganj upazila as locals set up factories at their respective houses. But for last two years they have been facing grave crisis due to lack of access to financial service, fall of price because of competition and import from India and China and incapability to fulfill the demand of latest fashion and improved quality. Another main setback of this industry is seasonality of the product, the market of warm clothes lasts only for four months during winter so the factories remain almost idle for the rest of the year. According to local entrepreneurs demand has fallen in previous two years as winter season lasts for very short period and huge products left unsold. However still 600-800 small and medium industries have been operating and a good number of people are employed in this sector as skilled or semi-skilled labor, technician, trader and entrepreneur. In terms of the number of workers maximum firms are small but there are many medium and some big factories like which has a setup of six hundred sweater making machines.

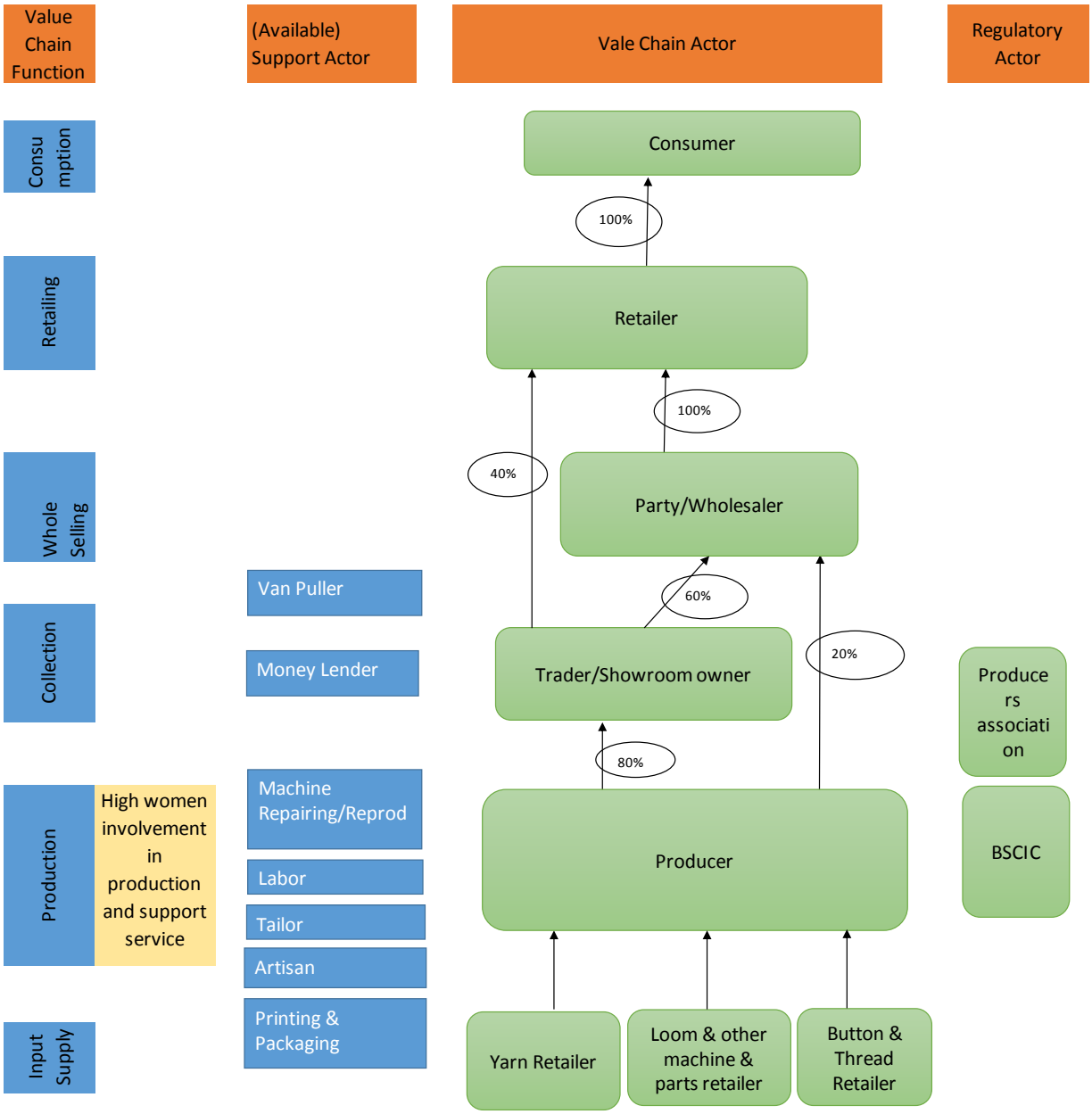
Small entrepreneurs mostly produce their products using unpaid family labor. Hosiery or warm cloth weaving requires many ancillary work like yarn preparation or conning by manual or electric spinning wheel, sewing the edge of scarves, caps, button hole making in sweater or cardigan, calendaring, labeling and packaging etc. There are some other value addition tasks like bid work, hand embroidery, lace or flower making and pasting on cardigans etc. In the peak season a worker can earn BDT 300-400 per day by knitting 6-8 dozen scarves or 20 dozens cap. Entrepreneurs pay BDT 8-12 /dozen for sewing cap and BDT 15/kg for conning yarn.

Participation Status of Women in the Value Chain

[4] http://archive.thedailystar.net/newDesign/print_news.php?nid=123315

Women involvement is comparatively high in warm cloth sector at Kochashohor. Knitting machine or loom operation which need technical skill is mostly dominated by male employment. In other roles where skills increase with experiences like sewing, embroidery, conning yarn, finishing works show more women participation. In the study area society is liberal to women involvement in hosiery or warm cloth production sector. But women employment is mostly unpaid in own house based small factories where they are actually supporting their male members in the work. The study team didn't find any women involvement in input market and forward market activities.

3.9.3 Warm Cloth/ Hosiery Value Chain Map



3.9.4 Input and Service Market Analysis

Inputs: The main input of worm cloths or hosiery production is various types of yarn. According to an input market entrepreneur they collect yarn lot (mostly acrylic and nylon) from different garments and textile industries of Gazipur and Narayanganj and sell to the producers in their desired quantity (kg). Few traders import yarn from India for warm cloth like sweater or cardigan producers. Sometimes trader collect white yarn and dye them from different dying factories of Narayanganj. Other important inputs for this sector are the sewing thread, buttons, labels, poly bags and paper packets. All these inputs are available in Nayarhat.

Major Service Providers in Warm Cloth/Hosiery Value Chain

Major Service Provider	Service Provided
Trader	Supply yarn
Knitting machine and parts seller	Sell machine and parts
Repairing/Reproducing Technician	Repair and reproduce machine
Labors	Production, sewing, finishing, labeling, packaging, sales
Artisan	Making flower, embroidery, bids work
Printers	Printing labels and packaging

Local service providers: There are some service providers such as- Knitting machine and parts seller, repairing/Reproducing Technician, labors, artisan, printers who provide different types of services like- sell machine and parts, repair and reproduce machine, production, sewing, finishing, labeling, packaging, sales, making flower, embroidery, bids work, printing labels and packaging. Some medium entrepreneurs use German, Korean or Indian reconditioned machines and second-hand machines bought from Dhaka or Narayanganj based large factories. Producers can use the facilities of the engineering industry and iron casting facilities in a nearby district, Bogra, local knitting machine repairers can repair and reproduce machines as per the requirements of entrepreneurs. Such types of machines cost around BDT 6,000-30,000 while an imported power-operated machine costs around BDT 1,00,000. Small entrepreneurs need financial service to develop their units like change or improvise their machines or looms with new pattern or design according to the market demand.

Financial Service: Producers do have need of taking loan for their business development. Although loan is available in the NGOs but this type of business need large amount of loan. Poor women and disadvantage people face problem to enter in this business as it is a large business compare to their financial condition. However, entrepreneurs often lend money from an informal money lender in high interest as they have lack of access to specific financial services of bank or MFIs.

3.9.5 Output Market Analysis

The initiation of the specialized market at Nayarhat in the late nineties attracted traders to the cluster which solved the problems of product marketing. Interestingly few producers started to maintain their showrooms in the market, where they met the outside traders to collect orders. Small and medium producers sell their products to traders at Nayarhat market. During the winter season a lot of wholesalers from different areas of the country come to Kochashohor and buy warm clothes.

Market Channels: Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Market Channel – I	Producer – Party/ Whole Seller – Retailer – Consumer
Market Channel – II	Producer – Showroom Owner/Trader – Party/ Whole Seller – Retailer – Consumer
Market Channel –III	Producer – Retailer – Consumer

Demand of warm clothes has been falling down in last two years because of the short winter season. There is an export potential of hosiery product like socks, hand gloves, scarves etc. to other countries. Producers or producer groups can be linked with such export market through development interventions.

3.9.6 Enabling Environment

Infrastructure: Kochashohor is a remote union of Govindaganj upazila in Gaibandha district. According to the local entrepreneurs, there is a link road that connects Kochasohor union with Dhaka-Gobindaganj highway has contributed to the expansion of this cottage industry in that area. Such good communication network reduced the cost of transportation of raw materials and finished products.

Public Body: BSCIC (Bangladesh Small and Cottage Industries Corporation) is a government body to look after small and cottage industries. Unfortunately, they have no specific service to warm cloth/hosiery production cluster in Gaibandha. The government body can patronize the cottage industry by providing training to the owners and workers in modern technology and helping them in linkage establishment with exporters.

3.9.7 SWOT Analysis

Strength	Weakness
• Home/cottage based industry so comparatively low cost of production • Availability and easy access to input material • Local improvisation of costly foreign machinery • High engagement of women and family labor	• Seasonal demand of warm cloth • Fund crisis due to unavailability of proper financial service or product. • Sudden fall of demand and price due to shortening of winter season • Not followed the modern fashion trend

Opportunity	Threat
• Good national market demand • Quality improvement by training and technical support • Product diversification and export potential	• Competition with imported product • Interruption of electricity supply

3.9.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that worm clothes producers face/have, underlying causes of those problems/constraints, existing service weaknesses, and also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- lack of access to appropriate financial product/services, lack of access to high-end round the year market demand this will not be a potential value chain for Gaibandha district. Suggested interventions for developing hand stich value chain include- facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producer's requirement, facilitate in developing service groups like pre-production (yarn conning) and post-production (sewing, calendaring) and facilitate linkage with high-value product and export market. However suggested interventions can be undertaken by the project; this value chain cannot change the status of women or disadvantaged people.

Problems	Constraints	Underlying Causes	Intervention Needed
• Low profitability	• Lack of knowledge on latest fashion/ trends; lack of product diversification	• Lack of training and support service by government and private sector	• Facilitate training service provisions through public and private sector on product development and diversification • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers requirement • Facilitate in developing service groups like pre-production (yarn
	• Lack of access to appropriate financial product/services • Lack of access of modern sewing technologies, techniques and services	• Bank/MFI/Public sector (BSCIC) support service is not available based on particular value chain production demand	

	• Lack of access to high-end round the year market demand • Interruption in power supply	• Lack linkage with high-end and export market channel	conning) and post-production (sewing, calendaring) • Facilitate linkage with high-value product and export market

3.10 BAMBOO MANUFACTURED PRODUCT VALUE CHAIN ANALYSIS

3.10.1 Background

Bamboo is one of the most important non-timber forest products in Bangladesh. Bamboo is popularly known as the "Wood for Poor". Bamboo is also used for scaffolding and roof shuttering during building construction. Bamboo based craft production is a major off-farm sector which plays an important role in the rural economy of the country. This study was aimed to identify the employment opportunity on bamboo based commodity production, variability of products and market system. The study areas included Domar and Syedpur upazila in Nilphamari and Polashbari in Gaibandha. A huge number of people are involved in bamboo crafts production and most of them are women while some are from *dalit* community like '*Dome*' or '*Rishi*'. There are also another large number of people depend on bamboo crafts trading for their livelihood.

3.10.2 Product Analysis

In the country, bamboo is available both from forest and non-forest areas and can be categorized into forest bamboos and village bamboos based on their primary collection source. Bamboo and bamboo product play an important role in employment for low-skilled rural workers and generating income for bamboo artisans or producers. Bamboo craft production is a cent percent labor or artisan oriented sector. There is a long tradition of bamboo craft production in many areas of Bangladesh and the production pattern varies upon different products and producer community. The prevalent bamboo manufactured products found in the study areas are as follows:

- *Bera*/Fence
- *Chatai*/*Dhara*/Mat
- Bamboo Strip for betel nut plantation

- *Jhuri*/Basket for mango, *lichi* and vermicelli packaging
- *Chaluni*/Screener
- *Tukri*/*Daali*/Basket
- *Duli*/*Dol*/ Grain storage
- *Dala*, *Kula*/winnowing fan
- *Dhakna*/lid
- *Mathal*/Cap
- *Khacha* for chicken transportation etc.

Dhara or *chatai* is the most dominant and regular product as it has higher demand in rural area. Besides *jhuri* or basket for fruit or vermicelli packaging is a seasonal item require during fruit harvesting period and holly Ramadan. *Tukri* or *daali* or basket used for various purposes from agricultural need to carrying soil/sand by labors. *Duli* or grain storage is another seasonal item. The profit Tribal or Dalit people used to make *dala*, *kula* and *chaluni* and muslim community doesn't make these thing because of socio-cultural practice. The profit of bamboo manufactured products depends upon the experience and skill of producer or artisan. For example, as many '*Bata*' or slip one can extract from a single bamboo, would decide more production of *dhara* or chatai, basket and so on which in return bring higher amount of sales revenue. Betel nut plantation needs huge amount of bamboo strip mostly supplied from Polashbari upazila of Gaibandha. This product require very low skill to split bamboo logs into strips and often family members mostly women and children do this work.

Cost Benefit of Producer:

Product: Bamboo manufactured 'Daali', Manufacturing time: 2 days

Items	Cost (BDT)	Remarks
Makla Bamboo	200	Standard size single piece
Binding Wire/Nail	20	Use to fasten
Labor		Self and family labor
Total production cost (around)	**220**	

Sales and profit

Average production	Average Price of per KG	Total sells
15 Daalis	30	450

Total Sells = BDT 450

Total Production Cost= BDT 220

Total Benefit= 450-220 = BDT 230

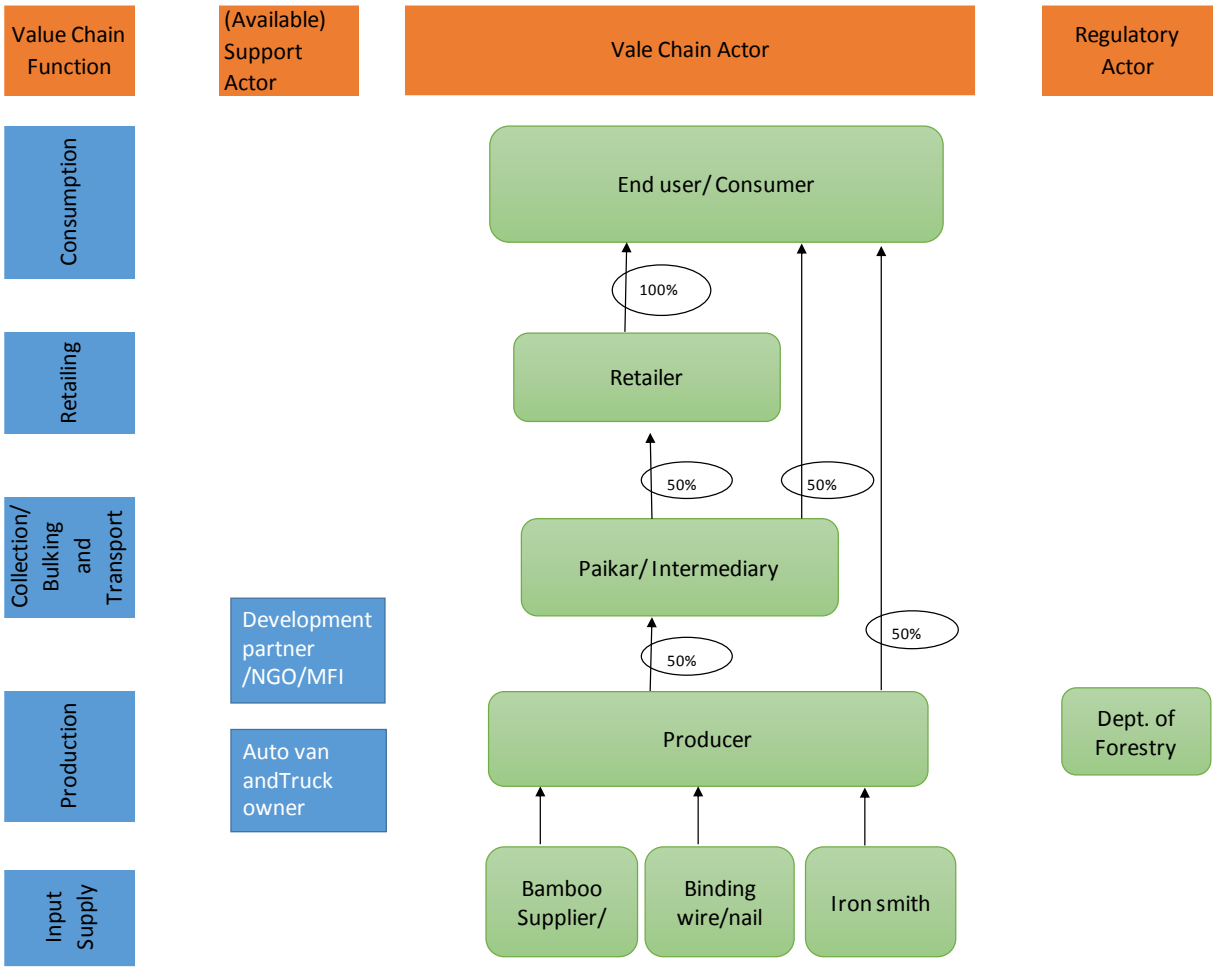
Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 230/220= 1.05

Constraint: There is no adequate training facility for artisans working in the industry regarding product development and diversification. Further, producers have been doing this work for several generations and they have lack of entrepreneurship attitude.

Participation Status of Women and Disadvantage group in the Value Chain

Gender plays a key role in the bamboo-based cottage industry in Bangladesh. In the study areas it is mostly household approach and female involvement is significantly high. The responsibility of women in rural Bangladesh includes looking after the household and children, tending poultry and cattle, collecting fuel wood and cow-dung and maintaining home gardens. Besides these tasks, the women of bamboo artisan families contribute in bamboo craft production like making basket, *dhara* and splitting bamboo logs into strips etc. Raw material collection is mostly done by male members along with bamboo slip/*bata* extraction, producing goods and selling goods in market or from home. However, there is an opportunity of inclusion of disadvantage group in this value chain.

3.10.3 Bamboo Craft Value Chain Map



3.10.4 Input and Service Market Analysis

Inputs (bamboo and cutting tools): There are varieties of bamboo plant in Bangladesh. Bamboo craft producers mostly prefer *Makla* and *Tallao* bamboo to manufacture finished products. In the study area, we found that most of the bamboo was collected from local hats through intermediaries, brought from char areas of Lalmonirhat and Gaibandha. A good portion of bamboo as a raw material was found to be collected directly from local homesteads and village bamboo groves. The main problem is the scarcity of raw material during the rainy season when the prices are two to three times higher.

Producers use traditional '*Katari*', iron made chopper or machete as their sole tool to make bamboo crafts.

Labor: Producers are mostly using own or family labor. There is a health issue of bamboo made product labor like back pain as this work require long time sitting activity.

Financial Service: Producers do not take any credit support from any bank or MFIs, although NGOs are available. However, NGOs has been a major actor in providing the loan, but their products have weekly installment system and do not consider particular bamboo product making season or producer demand.

Transportation: Auto van and truck used to transport products to local or distant markets. There is no problem regarding transportation of products from one place to another.

3.10.5 Output Market Analysis

In the study areas at Domar and Syedpur upazila in Nilphamari and Polashbari in Gaibandha, We identified three different marketing channels for selling of bamboo manufactured finished products. Producers mostly sell their products in the local market to end user. Often *paikar* buy the products from producers' house or rural market and sell them at other upazila or district market to retailer or end user. *Paikars* who sell *dhara/chatai* or mat might have fixed shed in the local market where he procure products from producers and sells mostly to end consumer and retailer of another market. Bamboo strip *paikars* transport their products by truck to Rajshahi and sell their product to retailer whom they used to call *paikar*.

Market Channels:

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Market Channel – I	Producer – End-user/ Consumer
Market Channel – II	Producer – Paikar/Intermediary – Retailer – End-user/Consumer
Market Channel –III	Producer – Paikar/Intermediary –End-user/Consumer

3.10.6 Enabling Environment

Public Body: The government initiatives are rather limited in bamboo craft sector. The Government has been promoting bamboo plantation in many areas of Bangladesh. Department of forestry provide permission to collect bamboo from natural forests and '*Bash Mohal'* or Bamboo groves but there is no direct incentive or program for bamboo craft producers' livelihood development.

Presence of Development Actors: In the study there are several NGOs made some effort to promote bamboo craft production through incentives and making the market linkage.

Environment Impacts: Bamboo made products are eco-friendly but the unplanned collection of bamboo from natural sources may risk this resource over-exploited.

3.10.7 SWOT Analysis

Strength	Weakness
• Low cost of production and comparable better price • Traditional practice and skill • Better price comparable to many agricultural products • Favorable ecological condition • High engagement of women and family labor • Diversified use of bamboo product	• Totally manual system of production and takes comparatively long time • Input is not available all the time
Opportunity	**Threat**
• Product development and diversification • Export potentiality as eco-friendly product • Opportunity to include disadvantaged group in this value chain	• Intrusion and popularity of synthetic substitutes • Health issue of workers like back pain as this work require continuous sitting position. • Excessive extraction of forest bamboo can make negative impact on environment

3.10.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that bamboo product producers face/have, underlying causes of those problems/constraints, existing service weaknesses, and also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like-lack of attitude, interest and knowledge on producing high value or diversified product, unavailability of raw material and lack of access to appropriate financial product/services this can be a high potential value chain for Nilphamari and Gaibandah which would increase income of the poor,

especially of women and disadvantaged people. Suggested interventions for developing bamboo value chain include- facilitate training service provisions through public and private sector on product development and diversification, ensure availability of raw material from planted and natural resources and facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers requirement. If suggested interventions can be undertaken by the project, this value chain can improve the condition of women and disadvantaged groups as well as enhance household income to a good extent.

Problems	Constraints	Underlying Causes	Intervention
• **Low profitability** • **Return on investment is low compared to the amount of time**	• Lack of attitude, interest and knowledge on producing high-value or diversified product • Lack of bamboo product trade entrepreneurship attitude among the community people	• Lack of training and support service by government and private sector	• Facilitate training service provisions through public and private sector on product development and diversification • Ensure availability of raw material from planted and natural resources • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers requirement • Facilitate entrepreneurship to producer community • Linkage with high value product and export market
	• Unavailability of raw material	• production and supply crisis during monsoon • Dependent on natural input	
	• Lack of access to appropriate financial product/services	• Bank/MFI/Public sector (BSCIC) support service is not available based on particular value chain production demand	

3.11 AROMATIC RICE VALUE CHAIN ANALYSIS

3.11.1 Background

Bangladesh is the world's fourth highest rice-producer and one of the highest per capita consumers of rice. Rice is deeply rooted in Bangladeshi culture and way of life. It is the staple food of about 160 million people in Bangladesh. In the financial year 2013-14, rice production

reached 34.449 million tons.[5] For last few years there has been a bright prospect of boosting aromatic rice production in the northern region of Bangladesh which have enormous demand at home and abroad. According to local farmers, agriculturists, traders and millers the area comprising Dinajpur, Natore, Chapainawabganj and Naogaon is traditionally familiar to producing aromatic rice. High price and increased demand of aromatic rice have made farmers interested about paddy cultivation. Farmers mostly cultivate Chinigura, Kataribhog, Zirakatari/ Phillipine Katari/ BR 38, Basmati/ BR 50/ Banglamoti, BR 34/Zira and some other varieties aromatic rice among which local variety Chinigura and high yield variety BR 34/ Zira are most popular.

Rice production currently accounts for 77% of agriculture land use maintained by some 13 million farm families. Such magnitude of concentration and involvement for a single crop is quite rare in the world.[6] Farmers grow different types of rice in different seasons throughout the year. In Dinajpur region, farmers grow Chinigura, Kataribhog and BR 34 or Zira *dhan* during the Aman season and BR 50 or Banglamati or Basmati during the Rabi season. According to DAE officials of Phulbari upazilla, Dinajpur, there are around 17,260 hectares of land under rice cultivation in Dinajpur district and 75% of the land have been using for aromatic rice cultivation in the current Aman season in the year 2016. Farmers sow seed on seed bed by the mid of Bengali month Shrabon (last of July) and transplant them into field after 30 days. In a bigha (33 decimal) aromatic rice require 15 kg Urea, 15 kg TSP, 10 kg MoP, 8 kg Gypsum, 500gm zinc and 500gm boron. Farmers use their inherited rice cultivation knowledge rather than any suggestion by DAE officials. For aromatic rice farmers take special care on weeding, supplementary irrigation and diseases like *blast* and *tungro*. Aromatic rice life cycle is relatively high than the regular variety and they take 135-150 days for getting harvested, so farmers get the paddy by the mid of Agrahayan (late November).

3.11.2 Product Analysis

Bangladesh produces many aromatic rice varieties for regular consumption as steamed rice as well as for pulao, biryani, jorda, payesh preparation. Kalijira, Chinigura, BR 34, BR 38 and BR 50 or Banglamoti have attractive qualities like small to medium sized grains, fine aroma, and soft considered for dishes like pulao or biryani. There are other verities with such desirable qualities those are grown in various area of Bangladesh but no well-known beyond those area. Besides the growing domestic market, in western and middle eastern countries where Bangladeshi communities constitute a major export market that can be successfully capitalized with proper promotion and marketing incentives. According to millers and DAE officials, with proper promotional support Bangladeshi fine quality and aromatic rice could find significant markets both at home and abroad.

Participation Status of Women in the Value Chain

[5] http://www.knowledgebankbrri.org/riceinban.php
[6] http://en.banglapedia.org/index.php?title=Rice

Usually, women participation or involvement in rice value chain as compared to other agricultural products is comparatively negligible or. The limited participation they have is mostly in post-harvest stages (threshing; boiling; drying; etc.) as unpaid family labor. The study revealed low involvement of women in input purchase, product sales or in any other cultivation related activities. Women presence in transportation, and other relevant service areas was also found to be small.

Cost Benefit of Farmer

Crop: BR 34/Jira Dhan, land size-33 decimal, crop period: 135-150 days

Items	Cost (BDT)	Remarks
Irrigation	300	Aman variety aromatic rice require supplementary irrigation only.
Tilling	1200-1500	
Seed	400	It requires 3-4 kg seed for 33 decimal
Fertilizer	1000	Use 2-3 times
Pesticide	350-400	Use 2 times
Labor	2500-3000	Require 3 times during sowing, weeding and harvesting along with self-labor
Post harvesting		Mainly own and family labor
Total production cost	**6600**	

Sales and profit

Average aromatic rice production in one season	Average Price of aromatic per Mound	Total sells
9 Mound	1,200	10,800

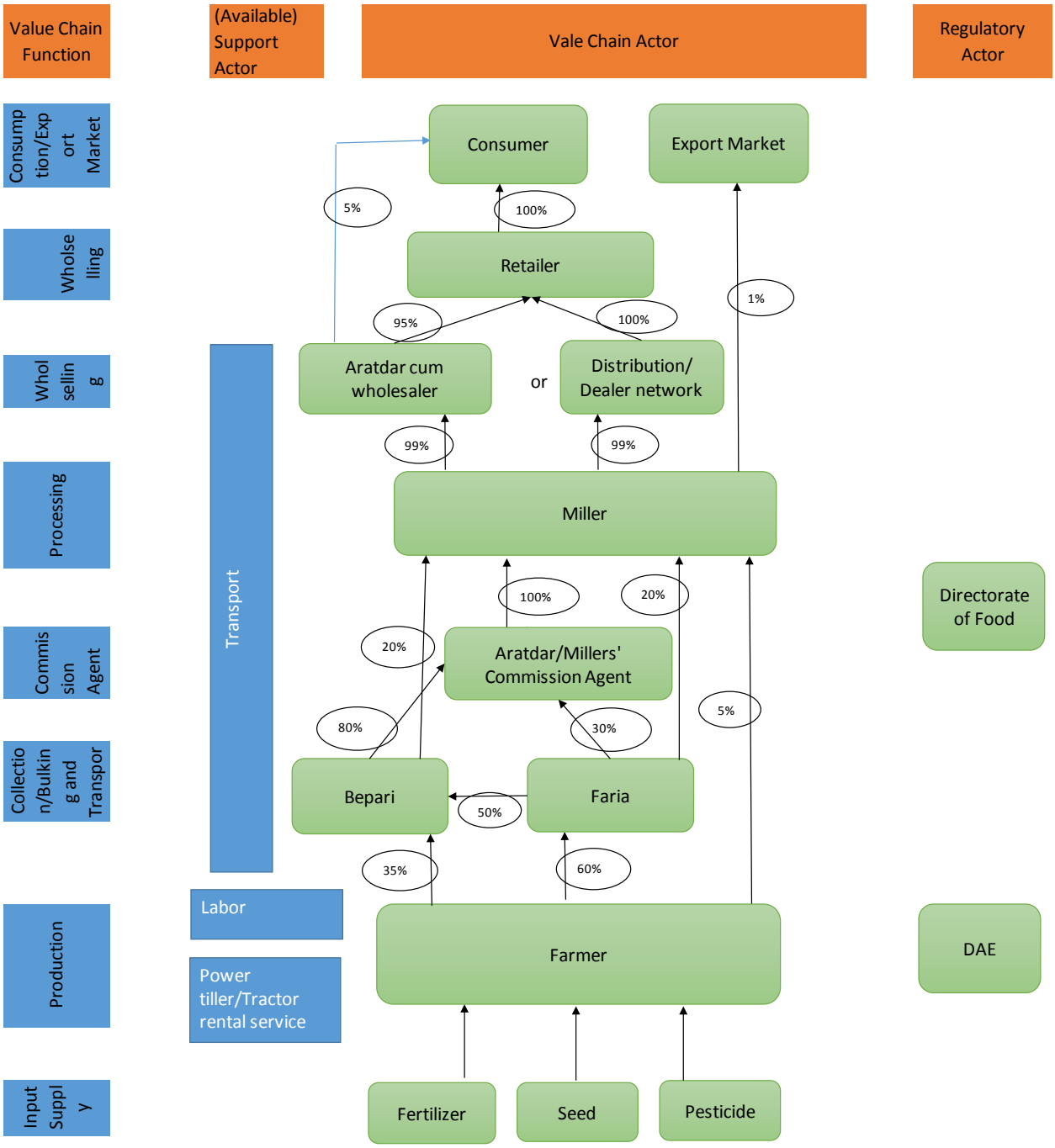
Total Sells = BDT 10,800

Total Production Cost= BDT 6,600

Total Benefit= 10,800-6,600 = BDT 4,200

Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 4,200/6,600= 0.64

3.11.3 Aromatic Rice Value Chain Map



The first three market channels are most prominent in Bangladesh

3.11.4 Input and Service Market Analysis

Inputs (Seeds; fertilizers; pest): Inputs used in vegetable production can be distinguished into two broader groups – seeds and agrochemicals (like fertilizers, pesticides and micronutrients). Among those, seed is the most important one as there are unavailability of reliable and quality seed of aromatic rice. Aromatic rice seed is not available from BADC or private sectors. So farmers depend on open seed retained by few famers in previous season. In our study area at Khoyerbari union of Phulbari, Dinajpur farmers collect farmers grown seed from retailers of Aambari and Chirirbondor which are famous aromatic rice growing area for long ago.

In Bangladesh paddy growers mostly relies on chemical fertilizer like Urea, MoP, DAP and TSP. This fertilizer market is dominated by the Bangladesh Chemical Industries Corporation (BCIC) and Bangladesh Agricultural Development Corporation (BADC). Aromatic rice grower also use micro nutrients like boron, zinc, etc. Private companies operate distribution network throughout the country to sell seed, fertilizer, micro nutrients, hormone and pesticide. According to the farmers, pest attacks are common in aromatic rice. So pesticides are being used vastly in rice production. In our study area we found that farmers use pesticide for green leaf hoppers and fungicide. For fertilizer and pesticide selling, revenue generation depends on the personal skills of the seller, including technical knowledge, linkage with customers, market expansion capacity, communication skills etc.

Labor: Labor requires least skills among all the services and hence generates the lowest amount of revenue. But in rice cultivation especially during harvesting it requires more labor which significantly increase the cost of goods sold. It can be minimized by popularizing cost effective collective reaping machine.

3.11.5 Output Market Analysis

Usually in Bangladesh farmers grow rice for their own consumption and sell the rest of the amount. But aromatic rice is kind of cash crop, cultivated mainly for selling. From the field visits, we found that paddy traders collect paddy from local farmers and supplied it to the rice millers mostly in Chapainawabganj and Natore area. Major part of paddy is assembled for selling in local markets such as phulbari, kaharol, parvatipur, ambari etc. On top of that some large food producer companies like Pran, Square and some others large buyer collect paddy through agents, process to rice and sell through their distribution network. There is a huge unmet demand of aromatic rice which currently met through import from india and Pakistan (especially basmati).

The characters of various output market actors of aromatic rice in Dinajpur are explained briefly.

Farmers: Farmers often sell their paddy to farias from their home, to beparis at the local markets. Small and marginal farmers often suffer from cash constraints and lack sufficient storage capacities which make them sell the maximum or entire amount of sellable products and pay the dues of production and harvesting cost. They can have competitively good price if they can store the paddy for additional 2-3 months. For example in last year a unit of 75 kg Chinigura paddy

sold at BDT 2200-2400 at the peak time after harvesting and the same unit sold at BDT 2800 after 1-2 months of peak selling time.

Farias: They are small and seasonal traders who handle small volume of aromatic paddy. They purchase from the farmers house directly and sell to both the aratdar or commission agent and the millers.

Beparis: They are the traditional rice traders or local parboil rice husking miller who handle comparatively large volume of aromatic paddy. Beparis generally purchase paddy from the farmers and from the farias. Beparis sell paddy to the aratdar or commission agent and directly to the millers.

Aratdar/Millers' Commission agent: Aratdars are larger volume traders who have their own storage facility or arat. They purchase paddy from Farias and Beparis. They are usually commission agents. They charge a fixed rate of commission for providing facilities to other middleman. They supply paddy in a large volume to the millers in exchange of commission.

Miller: Millers purchase paddy from farmers, farias, beparis and often through their commission agents who contacted with the farias and beparis on behalf of the miler. It was found that private companies like Pran has set some commission agents in different market area and collect rice through them. The private companies closely monitor the market and price and place their demand to their collection agents. According to a high official of Pran "from next harvesting season some private companies like Square along with Pran will directly purchase from farmers in local market and from mill premises at competitive price". Millers process paddy into rice and sell to aratdar cum wholesaler. But food processing companies like Pran add some more value like color sorting, grading and packaging aromatic rice as Fast Moving Consumer Goods (FMCG) and sell to domestic and international market through their marketing channels.

Aratdar cum wholesaler: Aratdar cum wholesalers are commission agents having strong business establishment with comparatively high financial capacity and storage facility. Along with millers they are the key player of the rice market value chain. The millers sell their commodity to them on reception of fixed commission like BDT 150-200 per ton. Aratdar cum wholesaler act as wholesaler to sale rice to local retailers and to the wholesalers of different districts.

Retailer: Retailers are the end point of the chain who purchase aromatic rice mostly from local aratdars and sell the entire volume to the consumers.

Major Market Channels

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers

Domestic Market (Non-branded)

Market Channel – I	Farmer – Faria – Aratdar/Commission Agent – Miller – Aratdar cum Wholesaler – Retailer – Consumer
Market Channel – II	Farmer – Bepari – Aratdar/Commission Agent – Miller – Aratdar cum Wholesaler – Retailer – Consumer
Market Channel – III	Farmer – Faria – Bepari – Aratdar/Commission Agent – Miller – Aratdar cum Wholesaler – Retailer – Consumer
Market Channel – IV	Farmer – Bepari – Miller – Aratdar cum Wholesaler – Retailer – Consumer
Market Channel – V	Farmer – Miller – Aratdar cum Wholesaler – Retailer – Consumer
Domestic Market (Branded like Pran/Radhuni)	
Market Channel – VI	Farmer – Faria – Aratdar/Commission Agent – Miller – Distributor/Depot/Dealer – Retailer – Consumer
Market Channel – VII	Farmer – Bepari – Aratdar/Commission Agent – Miller – Distributor/Depot/Dealer – Retailer – Consumer
Market Channel – VIII	Farmer – Faria – Bepari – Aratdar/Commission Agent – Miller – Distributor/Depot/Dealer – Retailer – Consumer
Market Channel – IX	Farmer – Bepari – Miller – Distributor/Depot/Dealer – Retailer – Consumer
Market Channel – X	Farmer – Miller – Distributor/Depot/Dealer – Retailer – Consumer
Export Market	
Market Channel – XI	Farmer – Faria – Aratdar/Commission Agent – Miller – Export Market
Market Channel – XII	Farmer – Bepari – Aratdar/Commission Agent – Miller – Export Market
Market Channel – XIII	Farmer – Faria – Bepari – Aratdar/Commission Agent – Miller – Export Market
Market Channel – XIV	Farmer – Bepari – Miller – Export Market
Market Channel – XVI	Farmer – Faria – Aratdar/Commission Agent – Miller – Exporter – Export Market
Market Channel – XVII	Farmer – Bepari – Aratdar/Commission Agent – Miller– Exporter – Export Market

Market Channel – XVIII	Farmer – Faria – Bepari – Aratdar/Commission Agent – Miller –– Exporter Export Market

3.11.6 Enabling Environment

Infrastructure: Overall road and communications system in the project area was found comparatively better. Paddy or rice transport from farmers' end to rice mills and from rice mills to national market is mostly done by truck. This service is available but the transportation cost by truck is high during the peak season.

Public Body: Upazila DAE office rarely provides training to lead farmers on aromatic rice cultivation but their field officials like SAAO provide necessary suggestion regarding seed management, rice cultivation and pest control. Local DAE office had previously facilitated some demonstration of high yielding aromatic rice of BRRI dhan 34 to promote the aromatic rice cultivation.

Presence of development actors: The study team found currently no NGO is working in aromatic rice value chain in the study area but there were some initiatives by RDRS in northern region of Bangladesh regarding aromatic rice.

3.11.7 SWOT Analysis

Strength	Weakness
• Inherited knowledge and practice of rice cultivation • Favorable climatic and soil condition for cultivation	• Lack of financial capability of growers • Lack of knowledge on post-harvest processing for quality (desired moisture and crack or broken free) rice • Unavailability of seed • Limited scope of value addition at farmer/producer level • Limited women inclusion scope
Opportunity	**Threat**
• High and increasing domestic and international market demand • Potentiality of linkage with private sector	• Environmental risks like drought, fall of ground water level (which already happened in the Barendra region) • Lack of information on market demand and supply situation make growers vulnerable to price fluctuation

3.11.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that aromatic rice farmers face/have, underlying causes of those problems/ constraints, existing service weaknesses, and

also the possible interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints like- unavailability of improved quality seed, lack of proper information on market demand and supply situation and product prices, lack of proper information on market demand and supply situation and product price, this can be a highly potential value chain for Dinajpur District which would increase income of the poor and ensure high profit. Suggested interventions for developing aromatic rice value chain include- facilitate linkage with improved quality seed input suppliers; facilitate them in providing embedded services, facilitate linkage with millers or miller commission agent to ensure highest competitive price and information of demand and market price. If suggested interventions can be undertaken by the project, this value chain can enhance household income, bring foreign money and improve condition of women and disadvantaged groups.

Problems	Constraints	Underline Causes	Interventions
• Low yield • Low profitability	• Unavailability of improved quality seed	• Nationwide aromatic rice production is low so private sector is not concerned about aromatic rice seed marketing	• Facilitate linkage with improved quality seed input suppliers; facilitate them in providing embedded services • Facilitate linkage with extension service providers DAE and BRRI • Facilitate access to efficient post-harvest technologies (e.g., threshing; etc.) • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with farmers' demand • Facilitate linkage with millers or miller commission agent to ensure highest competitive price and information of demand and market price.
	• Lack of proper information on market demand and supply situation and product prices • Too many intermediaries reduce farmers' profit margin	• There is lack of information about domestic and international aromatic rice market size, demand and gap which bares public, private and development sectors' collective action to properly promote this value chain sub sector and guide farmers	
	• Lack of knowledge on improved production practices	• Limited coverage of extension services (DAE) • Lack of access to extension services (DAE) • Absence of development actor/NGO led capacity development/ support activities	
	• Lack of access to labor cost reducing modern agro equipment/ services (e.g., for threshing) • Lack of storage facilities	• Lack of access to appropriate financial product/ services that match particular value chain production cycle demands	

3.12 JUJUBE VALUE CHAIN ANALYSIS

3.12.1 Background

Jujube is a sour-sweet tasted fruit in terms of taste that is also very beneficial to health. It contains different minerals, and vitamins A and C. It is cultivated in almost every district of Bangladesh, but the best varieties are found in Rajshahi, Comilla, Khulna, Barisal, and Mymenshing districts. The total amount of production of jujube in Bangladesh is 72,000 tons per year. This fruit is eaten in the fresh condition or used as main ingredient in pickles.

3.12.2 Product Analysis

BAU, Thai- 2, and Apple kul are some of the varieties of jujubes that are farmed in the Sholua, Charghat, and Rajshahi areas. It is noteworthy that the farmers can earn less from jujube cultivation than from popular crop cultivation like mango, guava, and so on. The overall situation of jujube cultivation depends on different variables, such as profit, market demand, yield time, durability, production cycle, inputs, and so forth.

Production

Jujube is an annual fruit. Usually, the sapling is planted during Bengali month '*Chaitro*' (November-December). It takes one year or a jujube tree to bear fruits. Fruits are harvested during the months of *Magh, Falgun,* and *Chaitro* (November-December).

Production Steps:

- Land preparation: Farmer prepares the land for sapling plantation. They dig 10-12 inch deep holes after every 4 feet.
- Fertilizer application: Then he fills the holes with fertilizer (both chemical and compost), used tea leaves and keep them as it is for few days.
- Plantation: Farmers usually plant 200 saplings in one *bigha*. Apple kul sapling is pricier than BAU kul sapling comparatively.
- Weeding: He also are clears unnecessary plants and weeds from the garden.
- Fertilizers, pesticides, and hormone application: Then he applies fertilizer for the second time. When buds start to bloom, the farmer applies insecticides, fungicides, vitamins, hormone, and so forth.
- Harvesting: Then he hires outside labor to harvest fruits. Daily wage for labor is BDT 150. For plucking the Apple Kul variety, labor is difficult to find due to excessive thorn on the plants.
- Post-harvest activities: After the farmer brings the produces to his house, the female members and children help him in sorting and grading them. In some cases, he finds outside labor to do the tasks.
- Packaging: Female members help in packaging. Farmers uses plastic crates of capacity of holding 20-25 kgs. He then sends the crates filled with jujubes to local market or

local *arotdaars*. When he sends them to the national markets, he uses paper cartons of capacity of holding 1-1.5 kgs.

- Marketing: The farmer usually sells 70-80% of his total production to national markets. And 20% of total production goes to local markets.
- Home consumption & damage: 5-10% of total production is kept for home consumption. Almost 5 mound jujubes per *bigha* gets spoiled during harvesting activities and transportation.

Usually, he cultivates additional one or two products with jujube such as Moshuri, Mungh, Kalai, and so on.

Farmers have the traditional knowledge of Jujube cultivation. They have accessibility on input market, where required inputs are available. Famers are mostly satisfied with quality and price of required inputs.

They usually sell their fruits to *aratdars*. They grade the jujubes according to quality (good, medium and low), and take the damaged and bad fruits. With the help of family members or outside labor, the fruits are packed. To send the fruits to national markets like Dhaka, Naraynganj, Karwanbazar, Bogra, etc. they use paper made cartons. Plastic crates are used when farmers take the produces to local market or *arot* to sell. Jujube farmers sell their 10-20% of total production to local markets and 80-90% to national markets through *arotder*.

Work Allocation

Actors involved	Activities
Farmer and male members	Land preparation, buying inputs, plantation, fertilizing, applying pesticides and hormone, weeding, harvesting, sorting, packaging, bargaining about price, carrying goods to market, selling, collecting money
Female member	Preparing compost fertilizer, sorting, grading, packaging, cooking for laborers, in rare cases taking care of the garden (in case it can't be avoided)
Children	Sorting, packaging, taking foods to field

Levels at VC	Activities	Actors involved
Pre-production	Purchasing the inputs like fertilizer, insecticides, pesticides, fungicides, hormone, sapling, etc.	Farmer himself, male members of HH
	Land preparation	
	Digging hole and preparing for plantation	
Production		
	Fertilizing the land	

Levels at VC	Activities	Actors involved
	Planting saplings	Usually farmer himself or male members of HH.
	Taking care of plants, weeding	
	Irrigation	Farmer himself, male members of HH
	Applying pesticides, fungicides, fertilizer and hormone	
	Harvesting	Usually farmers hire outside labor for harvesting but he himself and male members of his HH also get involved.
Post production	Post-harvest activities like sorting, grading, packaging etc.	Female and children give support under the supervision of Farmers. However, farmers involve additional labor, if necessary.
Market	Selling	Farmer himself, male members of HH
	Bargaining with buyers	
	Setting price	
	Collecting money	

Cost and Benefit Analysis:

Expenditure for Production for one year per Bigah

Items	Explanations	Price	Unit	Cost
Sapling		15	200	3000
Labor	Labor for sapling plantation			3000
Labor	labor for Spraying			1000
Fertilizer	TSP	1350	4 Sacks	5400
	Potash	750	1.5 Sacks	1125
	Urea	800	2 Sacks	1600
	Boron	130	3 Kg	390
	Gipsam	100	2 Sacks	200
	Salphar	200	3 kg	600
	Dosta	130	3 kg	390
	Magnisium	20	5 kg	100
	Organic Fertilizer (ACI)		80 kg	1000
	Organic Fertilizer Compost		1000 mound	1400
Pesticide	Amistratop	320	4 Bottle	1280
	carbendazim	1200	2 kg	2400
	General Pesticide	2000	4 Liter	8000
	Vitamin Flora	200	6 Bottle	1200
	Emida Clorofil	940	2 Bottle	1880

Items	Explanations	Price	Unit	Cost
Bamboo log				2000
Net/Fencing				1500
Wire				500
Labor	Labor for fencing and wiring			1500
Irrigation		150	40 hours	6000
Labor	Labor for Irrigation			600
Power Tiller				3600
Jujube Plucking				4500
Arotder commission				5000
Total				**59,165**

Sales and profit

Average Jujube production in one year	Average Price of Jujube per Mound	Total sells
200 Mound	500	1,00,000

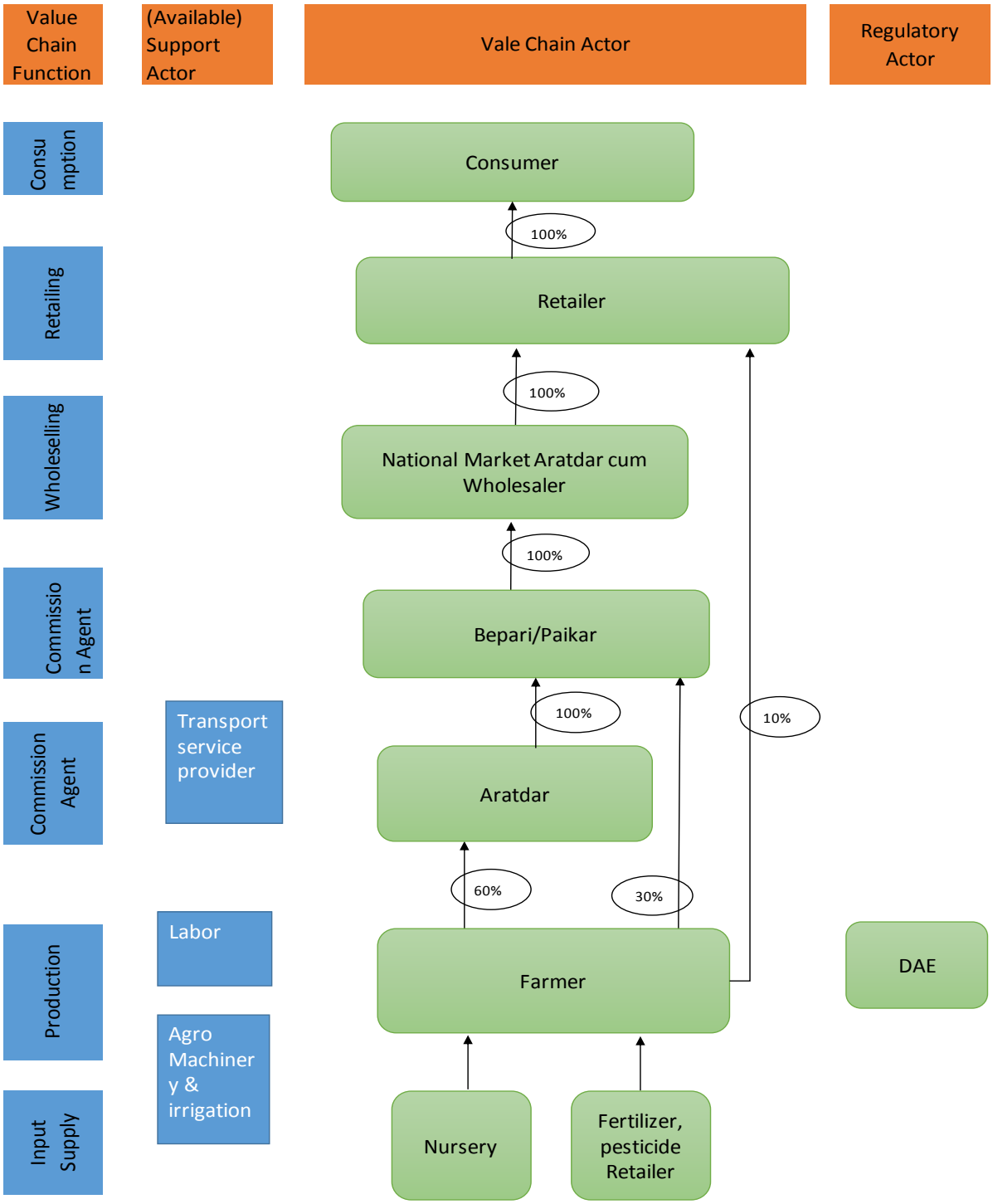
Total Sells = BDT 1,00,000

Total Production Cost= BDT 59,165

Total Benefit= 1,00,000-59,165 = BDT 40,835

Cost benefit Ratio= Present Value of Benefit/Present Value of Cost= 40,835/59,165= 0.69

3.12.3 Jujube Value Chain Map



Value Chain Map of Jujube

3.12.4 Input and Service Market Analysis

Inputs (saplings, pesticides and fertilizers): Inputs used in jujube production can be classified into three boarder groups- saplings, pesticides, and fertilizers. Jujube saplings (other than retained saplings) are supplied by various actors like Nursery (Natore, Puthia, and Bogra), Rajshahi Fruit Research Institute, and a local NGO. However, high yield variety is not cultivated in this area due to its lack of availability there.

Branded pesticides were found to be marketed by the permanent input retailers of the market. Syngenta, ACI, Agro, Square, and Auto Crop are some of the leading pesticide brands in the district.

Fertilizer is supplied by the private sector and the government. However, some of the farmers use organic fertilizer (compost) from their own livestock. Input seller sells fertilizer, pesticide, vitamins, hormones and other relevant agricultural inputs. The demand for fertilizer is high in the Bengali month of *Falgun-Chaitro*. The pesticides demand stays stable throughout the year. The main problems regarding the input market of jujube fruit are improper use of fertilizers and lack of pest/disease management. Local input retailers usually make 10-15% profit and the dealers make 20-25% profit on their businesses. Following tables shows general information of required inputs for jujube cultivation.

Input Retailers Product and Price list

Type	Name	Unit	Price
Fertilizer	DAP	1 sack (50 kg)	1250
	TSP	1 sack (50 kg)	1100
	Urea	1 sack (50 kg)	800
	MOP	1 sack (50 kg)	750
	Compost (ACI)	1 sack (50 kg)	600
	Magnesium (Mac Plus)	1 kg	50
	Magnesium (ACI-Plain)	1 kg	20
Vitamin	Zinc (ACI)	1 kg	80
	Zinc (Muktaplus)	1 kg	130
	Boron	1 kg	170
	Sulphar	1 kg	160
	Flora	100 ml	70
	Gypsum	1 sack (20 kg)	100

Type	Name	Unit	Price
Pesticide	Amistertop	100 ml	320
	Noin (carbides)	100 gm	120
	Nitro	100 ml	105
	Emitap	100 ml	180
	Asatap	100 gm	110-115
	Vatimeg	100 ml	150
	Topten	100 ml	80
	Licar	100 ml	90
	Carbondasim	100 ml	140
	Popiconajol	100 ml	170
	Syphermethin/Florophyphos	100 ml	140
	Indofil M 45	100 gm	70
	Zaj	100 gm	80
Hormone	Surprise	100 ml	110
	Planofix	25 ml	35

Labor: Big farmers hire labor for cultivation support especially in times of plucking jujube. There is a labor shortage for jujube cultivation process. Labor is even harder to find for plucking the apple kul variety due to its thorny features.

Finance: Although MFI is available, the jujube farmers do not receive any credit support from them. Additionally, banks do not provide them any support. Sometimes they take loan from the *Arotders*. However, farmers are not interested to take loan to cultivate Jujube by and large.

Irrigation: There is no problem of irrigation in the particular area. The irrigation services are sufficient and always available.

Power Tiller: There is no problem of tillage in that area and the service is available.

3.12.5 Output Market Analysis

Regional *arotdars* purchase jujubes from farmers (20%) and *beparies* (80%) in cash. He has relation with 100 farmers and 8-9 *baparies*. *Beparies* make profit of BDT 150 per mound. Regional *arotdar*

sells his good to national *arotdar* on 10% profit. His transaction modalities are on 50% credit and 50% cash. *Arotder* sells 80% of his fruits in Dhaka (Beribandh, Kawranbazar, Wasghat, and Lalkuthi) and 20% in Narayangonj. To send the product in Narayangonj, they incur additional transport cost. Regional *arotder* Mr. Lalon said that they face main problem of traffic jam in the high way while transporting Jujubes to national markets. He also mentioned excessive rain, spot marks, flower shedding as other problems of jujube cultivation. His suggestion was to develop a jujube variety that produces high yield. He also recommends to develop new technologies that would aid to scientific production of this fruit.

Local Arotdar Product and Price List

Name	Unit	Price (BDT)
BAU	1 mound	600-1000
Thai- 2	1 mound	1500
Apple	1 mound	2200

Major Market Channels

Producers use different output market channels to sell their produce, and here are some major/more prominent market channels used by producers.

Market Channels	
Channel – I	Farmer –Bepari – Large/National Aratdar – Retailer – Consumer
Channel - II	Farmer– Local Aratdar – Bepari – Large/National Aratdar – Retailer – Consumer
Channel - III	Farmer – Local Retailer

3.12.6 Enabling Environment

Infrastructure: Overall road and communication system is good. They can send their product to the national market. The only problem is traffic jam. As Jujube is a perishable product, smooth transportation system is very necessary in order to contain its freshness.

Public Body: Some of the farmers received training from Upazila Agriculture office. Farmers can get support ffrom the DAE office as necessary. Interestingly, SAAO is the local body of that area and therefore the farmers get instant support from him. Government officials of that area were

mentioning that Mango and Guava are the dominant product of that area. So, jujube cultivation faces difficulty to compete with mango and guava cultivation.

Presence of development actors: Currently no NGO is working in the jujube value chain development. Only one NGO is producing sapling with the help of disadvantaged groups.

3.12.7 SWOT Analysis

Strength	Weakness
• Jujube can be cultivated in integrated farming approach with other crops • Easy availability of inputs	• Low market price • Shortage of labor • Lack of storage facility • Lack of knowledge of proper use of fertilizer and disease management
Opportunity	**Threat**
• Opportunity for women involvement • Maximization of production with higher land utilization • Introduction of high yield variety • Setting of success stories of Jujube farmers to attract others to involve in cultivation	• Farmers (as well as other stakeholders) are becoming less interested in Jujube cultivation • Heavy rain causes spot on fruit. Therefore, the gets less price in the market • Society does not accept the involvement of women in this value chain

3.12.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that fishermen currently face/have. The problems extends out to the respective underlying causes and existing service weaknesses. Lastly, the fourth column suggests some promising interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, if relevant interventions can be taken against constraints mentioned in the table below, Jujube will struggle to become a potential value chain for Rajshahi district. The problems include low profitability, low yield, and lack of knowledge. Suggested number of interventions for developing jujube value chain include- introduction of high yield variety and proper integrated cultivation techniques, facilitation of training on scientific cultivation and post harvesting procedure, facilitation linkages with high end forward markets, dissemination of knowledge, creation of awareness in balanced use of fertilizer and pest/disease management, facilitation of linkages with extension service providers (DAE), ensuring efficient transportation and linkage with storage facilities. If suggested interventions can be undertaken by the project, then there is a probability to make an impact to the beneficiaries.

Problems	Constrains	Underlying Causes	Interventions
• Low profitability; therefore, producers have low priority for jujube value chain • Low yield	• Lack of knowledge on improved production practices (use of high yield variety, fertilizer and pest, disease management)	• No proper training on proper use of fertilizer and pest/disease management as it is not available to them • Jujube is not the prominent product of that area; stakeholders are concern about jujube • Lack of access to soil testing service	• Introduction of high yield variety which ensures profit • Disseminating knowledge and development of attitude of balance use of fertilizer and pest/disease management • Introduction of proper integrated cultivation technique • Ensure linkage with storage facilities • Facilitate training or capacity development on scientific cultivation and post harvesting procedure • Facilitate linkage with extension service providers (DAE) • Facilitate linkage with high end forward market • Ensuring transportation of Jujube in fresh condition with in very short time
	• Less profitable cultivation compare to mango and guava • Lack of storage and processing facility • Lack of access to forward market channels; and this results in low product price and low producer incentive or investment amount	• Jujube is a perishable product • Hybrid variety is not process able • Supply is greater than demand during the season	

3.13 TAILORING VALUE CHAIN ANALYSIS

3.13.1 Background

Tailoring is an off-farm activity which came before handloom. In search for an avenue for financial solvency and empowerment, women and adolescent girls adopted this profession. In Sirajgonj, major issues related with tailoring are skill and required training. In addition to this, business and financial management of tailoring business is also important. As a result, increasing demand, availability of skill, and capacity open up a possibility for women and adolescent girl to set up "home-based" tailoring business.

3.13.2 Product Analysis

Participants of the study mentioned that they have basic knowledge for this profession. They are currently running order-based business to meet the local demand (neighbors). Usually, they produce Fatua, blouse, petticoat, and three-pieces (salwar, shirt, and dupatta). They also make

dresses for kids like pants, skirt, onesies, shirt, three pieces, and so forth. The skills of local tailors are satisfactory, but they do not have knowledge of modern fashion trend, style and embroidery. Only the government organizations (such as Department of Women and Children and Department of Youth) are the main source of their training. They cannot afford to learn tailoring from other private sources because it is not available. But, in the poor household the adolescent girls are now interested in learning tailoring and becoming entrepreneurs. Although the training period is not sufficient, one can become an expert by working at local tailoring stores.

Work Allocation

This activity needs a good amount of time and concentration. Average working hours in this activity should be 6-8 hours per day. So, ultimately it gives women less opportunity than other members to take care of home. From FGD it was found, that on average a woman can work 3-4 hours per day. It takes 2 hours to sew an attire for kids. They follow all the steps such as cutting, sewing, stitching, attaching buttons, ironing, and delivering to customers.
In general, female do most (75–80%) of the work. Male members and adolescent girls help them in stitching buttons, hemming, ironing clothes, folding, and delivering.

Participation Status of Women

Home based tailoring is almost fully employed by women except for the input supply. Taking work order and selling to customers are entirely done by women. Male members of the family often support women by assisting in purchasing inputs, stitching buttons, ironing clothes, packaging, taking broken machine to repairman, and so on. Nevertheless, tailoring paves the way of self-dependency for a large number of rural and urban poor housewives, divorcees, unemployed young girls, adolescents, students, widows and disadvantaged groups of people.

Actors involved	Activities
Male member	Purchasing inputs, assisting in button stitching, ironing clothes, packaging, taking broken machine to repairman etc.
Female member	Sewing, stitching, ironing, packaging, sometimes purchasing clothes
Adolescent girls	Assisting in button stitching, ironing clothes, packaging etc.

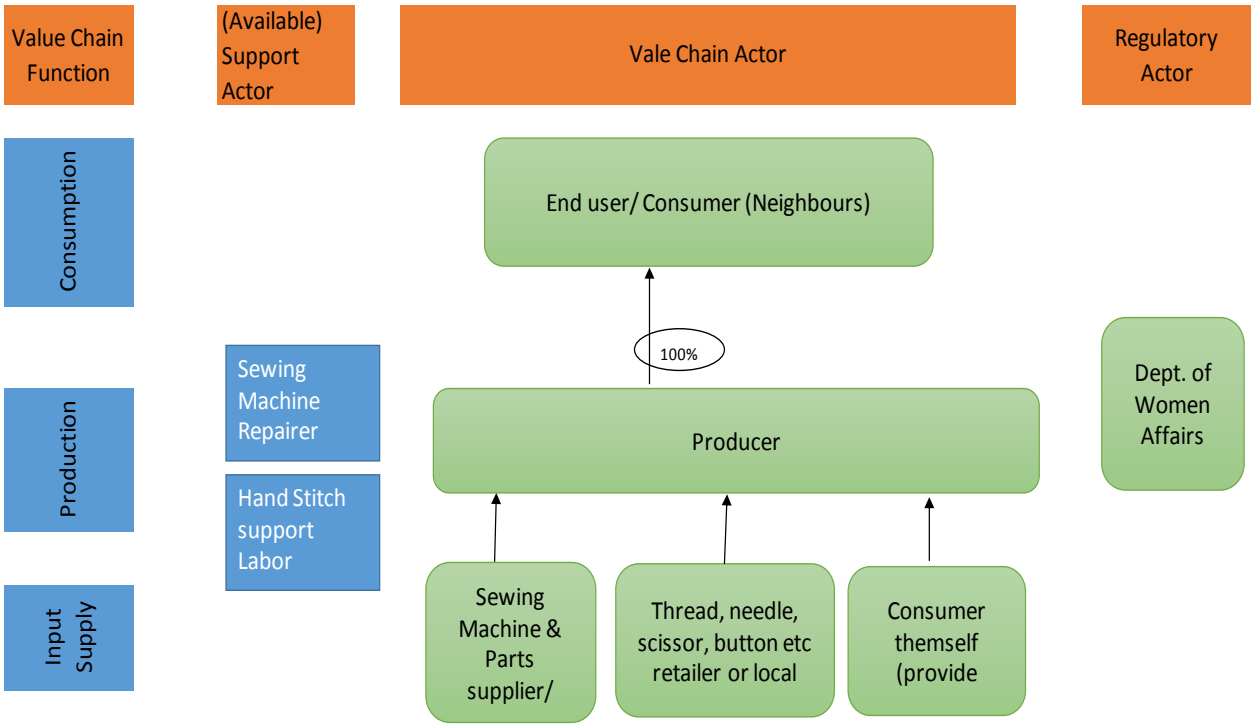
Activities	Actors involved
Purchasing the inputs like fabric, machine parts, machine oil, button, thread, needle, scissors, tape etc. from local market	Male members of HH, rarely female producer herself
Purchasing the inputs like button, thread, needle, scissors, tape etc. from neighboring market/ grocery shop	Producer herself
Purchasing sewing machine	Male HH head
Taking broken machine to repairman	Male member of HH
Receiving order and taking measurement	Producer

Activities	Actors involved
Selling	Producer
Bargaining with buyers	Producer
Setting price	Producer
Collecting money	Producer

Cost and Benefit Analysis:

Women can start their tailoring business by getting trained and purchasing sewing machines. On average, although a tailoring shop earns about BDT 3,000 to 5,000 per month in normal season after deducting all costs, they expect to increase it to BDT 6,500 per month. Their income increases up to BDT 10,000 during occasions like Eid and Puja. On average, they receive 90-100 orders per months.

3.13.3 Tailoring Value Chain Map



Value Chain Map of Tailoring

3.13.4 Input and Service Market Analysis

Inputs: There are various types of tailoring inputs like yarn, bokhrom, scale, scissors, marker, sewing machines, and so on. Apart from sewing machine, the other inputs are available in local market. The distance of these markets is within 2-3 kilometers. The inputs are available all the time and are not refundable. They have to sell 5% of their total purchased products at low price due to low quality. They purchase inputs in a big lot from big market which is 8-10 kilometers far from their locality.

Overview of Output Market

Item/ Service	Input supplier
Button, fabric, needle, thread, oil, chain, chalk, scissor	Local market & neighboring market/ grocery shop
Sewing machine	Local & city market

Sewing parts	Local market
Machine repair service	Local market actor
Sewing knowledge	Local tailors
Finance	NGOs (ASA, Grameen bank), Department of youth development

Labor: There is a shortage for labor in this sector as people are interested to work in factory. In a factory, workers have to work in a fixed time of the day and gets secured monthly payment.

Financial Service: Tailors do not get any credit support from any bank or MFIs, although NGOs (ASA, Grameen bank and BRAC) are available. However, NGOs have been a major actor in providing loan, but their products have weekly installment system and do not consider particular tailoring season or producer demand such as sewing machine.

Machine Serviceman: Access to the repair services was also found limited. At present, this service is provided by two local service providers. Producers reported it as a complex and time consuming service and the price is high. For this circumstance, it leads to a frequent interruption in production.

3.13.5 Output Market Analysis

Only neighbors and local people become the end customer for this value chain. During festivals like Eid and puja, the work load increases. They do not get any large purchase order. Local retailers do not have faith on their (traditional tailors) skill. Retailers think locally tailored clothes are of low quality and that cannot meet the demand of customers. Therefore, the local retailers buy clothes from large city markets. Another problem for local retailers is the lack of credit. They have to deal with the transactions with the traditional tailors by cash.

On the other hand, producers have lack of access to large buyers/ high end forward market channels. This has implications in production, product specifications and sales price because producers cannot produce according to large buyer/ high end buyer demand specifications. So they end up selling their products to local people in lower price.

3.13.6 Enabling Environment

Public Body: Department of Women Affairs and Youth development centers provide training to women and adolescent girls for free. Department of youth development arranges three to four training sessions in a year. Each session is consists of 21 days.

Presence of development actors: Currently no NGO is working in tailoring value chain development. Only one NGO was involved to train up female tailors, but they are not active anymore.

3.13.7 SWOT Analysis

Strength	Weakness
• Basic knowledge on traditional tailoring • Off-farm activity and potential of involvement of women and adolescent girls	• Low market demand • Lack of knowledge of modern fashion trend, style and embroidery • No forward market linkage • Lack of business planning and management • Standard of the product is not up to the mark
Opportunity	**Threat**
• Women, poor and disadvantage can start this business after getting training from govt. or a local trainer • Potential for additional income • No NGO is currently working to develop tailoring value chain	• Ready-made garments product is dominating the market in terms of availability, quality and price • No guaranty of regular purchase order from client • Lack of availability of labor as people is interested in working in factory

3.13.8 Constraints and Interventions Suggested

The table below describes the major problems and constraints that fishermen currently face/have. The problems extend out to the respective underlying causes and existing service weaknesses. Lastly, the fourth column suggests some promising interventions that the project should undertake against those constraints and service weaknesses.

As our findings suggest, relevant interventions can be taken against constraints like lack of knowledge in high-end/large buyer demand, lack of access to forward market channels, unavailability of local mechanical/ technical service providers, lack of business planning, lack of collective production or sells. However, it is hard to make tailoring value chain as a potential one for Sirajgonj district. Suggested number of interventions for developing tailoring value chain include promotion of training service provisions through public and private sector, improvement of knowledge and skills of entrepreneurs, promotion of awareness and linkage activities in forward market, ensuring consistent or regular demand of tailoring product throughout the year, and identification and development of linkage with potential large enterprises. If suggested interventions can be undertaken by the project, then there is a probability to make an impact to the women for their income generation.

Problems	Constraints	Underlying Causes	Interventions
• Low productivity • Low profitability • No demand in formal market	• Lack of knowledge on high-end/large buyer demand (desired product quality, modern production technologies, fashion trends and other specification) • Lack of access to appropriate financial product/services that much particular value chain production demand	• Training on modern production technologies and fashion is not available; Department of women affairs and Department of youth development conduct training but it is not sufficient and easily accessible • Absence of development actor/NGO led capacity development/ support service • It is not their main occupation	• Promote training service provisions through public and private sector to improve knowledge and skills of entrepreneurs • Promote awareness and linkage activities in forward market to ensure consistent or regular demand of tailoring product throughout the year • Develop local service provider • Identify and develop linkage potential large enterprise interested in sub-contracting • Facilitate training on entrepreneurship, leadership development, collaborative working and financial management • Facilitate linkage with appropriate financial services; appropriate financial products should be developed that match with producers requirement
	• Lack of access to forward market channels which results producers dealing with neighbors in lower price	• Producers cannot meet the requirement of the forward market actors • Forward market actors are not interested in purchasing traditional products	
	• Unavailability of local mechanical/ technical service providers; this leads to frequent interruption in production	• Volume of the production is not that much for someone to become a full-time service provider; providing service as part time business	
	• Lack of business planning; this leads to poor resource management, increased cost and low profitability • Producers do not practice collective production or sells	• No prior commercial or business orientation • Not aware of the benefits of collective approach	

4. Major Risks, Constraints& Opportunities

Bio-sketch of Value Chains

The table below presents the value chains for which we conducted detailed analysis and also the value chains which have potential in the specific project areas:

Selected Value Chain	Other Potential Value Chains
Sylhet Region	
Vegetable	Poultry, Duck Rearing
Capture Fish	Goat, Sheep Rearing
Lemon/ Pineapple	Bamboo Cane Product
Southern Region	
Hand Stitch (Home cottage based)	Dairy Beef Fattening
Crab Fattening	Honey Collection
Fish Culture	Vegetable Cultivation
Rangpur Region	
Medicinal Plant	Vegetable Cultivation
Woolen Blanket (Home cottage)	Poultry Rearing
Bamboo	Karchupi
Aromatic rice	
Bogra Region	
Jujube	Handloom
Tailoring	Vegetable Cultivation
Fish Culture	Dairy Beef Fattening
	Potato

Major Environmental Risks

Environmental Factors	Affected Region	Impacts

Continuous or Heavy rain	Bogra and Rangpur	Fruits become vulnerable to virus, pest attack, fruit spot
Hailstorm	Bogra and Rangpur	Buds and fruits get destroyed
Sudden flood	Sylhet	Total destruction of plants
Cyclone	Southern	Sudden destruction of production
Cold Wave	Bogra and Rangpur	Hampering the plant growth, Production decreases
Excessive Fogs	Bogra and Rangpur	Leaves get curly, Production decreases

Major Systemic Constraints and Opportunities:

Some major constraints and opportunities found in some value chains ae briefly presented below:

Dairy

Systemic Constraints	Opportunities
• Feeding practices of livestock is extremely poor. Farmers derive feeds primarily from crop residues and cereal by-products such as green grasses, and tree foliage and leaves supports bulk of the diets of animals being raised by smallholders. • Rice straw is the only dry roughage that is regularly being fed by the farmers • The farmers neither have scientific knowledge nor are following any feeding standard to satisfy the nutrient requirements of the cows. • Due to lack of available grazing lands, stall-feeding is practiced and sometimes cattle are tethered on the roadsides and fallow land. • Lack of access to appropriate financial products (that match with their production cycle and other terms) leads to poor feeding and disease management and low dairy productivity • Lack of access to appropriate sales market (high end buyers who provide better price according to fat content) generates a negative feedback to farmers to invest more on AI, vaccination, feed and disease prevention services. • Lack of access to different services including AI (artificial insemination), feed (green grass and	• High Market demand for milk with high fat content • High growth potential as it has been a widely popular and socially accepted income generating source • Milk production amount, lactation period, fat amount can be significantly improved/ increased • Opportunity of gender inclusion • As middle class families has demand of good amount of milk so different companies are coming with packet milk and they are collecting milk with fat volume and giving standard price

concentrated), shed management and disease management (vaccination; deworming; preventive measures; medication)	

Medicinal Plant

Systemic Constraints	Opportunities
• Medicinal plant is a seasonal product which might not ensure round the year income generation • Lack of access to forward market channels; and this results in low producer incentive or investment amount • Low availability of fallow land of small producers (producers usually cultivate medicinal plants in fallow land as it is their secondary source of income) • Lack of access to knowledge on improved production processes, cost-effective technologies and management techniques • Producers do not practice collective production management system	• High market demand for medicinal plants; at present most of the national demand is met by imports from different countries • Environmentally sustainable • Opportunity of gender inclusion

Beef Fattening

Systemic Constraints	Opportunities
• Feeding practices of livestock is extremely poor. Farmers neither have scientific knowledge nor are following any feeding standard to satisfy the nutrient requirements of cattle for optimum fattening. • Low year round productivity; beef fattening is primarily focused on occasions (especially Eid ul Azha) which ensures seasonal income but not year round profit • Lack of access to appropriate financial products (that match with their production cycle and other terms) leads to poor feeding and disease management and low beef productivity • Lack of access to different services including AI (artificial insemination), feed (green grass and	• High market demand for meat all round the year • High growth potential as it has been a widely popular and socially accepted income generating source • 3 to 4 production cycle in a year can be introduced • Opportunity of gender inclusion • Now a days large companies are started business of ready processed meat who purchase bull in good price

concentrated), shed management and disease management (vaccination; deworming; preventive measures; medication)	

Fruit

Systemic Constraints	Opportunities
• Disease and pest attack leads fruit damage and losses; this results in low productivity and price • Lack of access to knowledge on improved production processes, cost-effective technologies and management techniques • Lack of access to forward market channels; and this results in low product price and low producer incentive or investment amount • Lack of access to high yield variety saplings which results in low production and low quality fruits • Lack of access to storage and processing related knowledge and services	• Increasing market demand in urban and suburban areas • Female and youth can be included in this value chain

Vegetables

Systemic Constraints	Opportunities
• Lack of access to knowledge on improved production processes (improved seeds; soil quality; use of inorganic and organic fertilizers; natural pest management techniques, post-harvest technologies; other cost-effective technologies and services) • Lack of access to different services including improved seeds, soil testing, natural/ improves pest management services, etc. • Lack of access to high end forward market channels (that pay better price); and this results in low product price and low producer incentive or investment amount	• Nationwide year round high demand of different vegetables • High end buyers like Agora and Shopno are purchasing fresh and good quality vegetables from farm-gate at better market price • Opportunity of gender inclusion • Potential to improve income

Cottage

Systemic Constraints	Opportunities
• Lack of access to knowledge on modern production technologies and fashion trends; producers are not producing according to market demand • Lack of access to forward market channels • Unavailability of local mechanical/ technical service providers; this leads to frequent interruption in production • Lack of business planning; this leads to poor resource management, increased cost and low profitability • Producers do not practice collective production or sales	• Increasing market demand of fashion products in urban and sub-urban areas • Opportunity of gender inclusion • Women already have basic/ natural skills on stitching, sewing and embroideries

Duck

Systemic Constraints	Opportunities
• Feeding practices of duck is extremely poor. Farmers neither have scientific knowledge nor are following any standard to satisfy the nutrient requirements for high duck productivity (meat and eggs). • Lack of access to knowledge on improved production practices (duck feed; cage management; hatching; disease management; etc.) • Lack of access to different services including local hatcheries (for duckling), duck feed and disease management services like paravets/ vetenarians/ DLS (for vaccination; other preventive measures; medication) • Limited access to financial support to afford quality inputs (ducklings, ready feed, shed/coop etc.)	• High market demand as a special dish • Opportunity of gender inclusion • Potential to improve HH income

Fish

Systemic Constraints	Opportunities
• Lack of scientific knowledge of fish farmer leads them to use improper inputs and to poor pond management practice	• High market demand of fish round the year

• Unavailability of quality inputs at each production level results in low productivity • Lack of finance causing the household farmers demotivated and reluctant for fish cultivation • Lack of linkage of both in backward (nursery and hatchery) resulting farmers poor production and less profit •	• High end buyers and super shops like Agora and Shopno are purchasing fresh and good quality fishes from fisheries at better market price • Opportunity of gender inclusion

Crab

Systemic Constraints	Opportunities
• Dependency on nature for inputs leading overfishing of crablets • Increased risks (tiger, pirates, and so on) associated with crab catching making the collectors vulnerable • Lack of access to water bodies is one of the major constraint for poor or marginal farmers • Lack of access to knowledge on farm management improved production processes, cost-effective technologies and management techniques	• High Market demand of crab • High growth potential and it's increasing day by day • Opportunity of gender inclusion • Climate resilient value chain

Shrimp

Systemic Constraints	Opportunities
• Lack of access to water bodies like gher is one of the major constraint for poor or marginal farmers • Shrimp cultivation requires comparative high investment for extensive care and feeding management which is difficult for marginal farmers to manage • Lack of knowledge on proper cultivation practice and disease (specially virus) leads to sudden mortality resulting low production and price • Price of quality post larva (PL) is high resulting high production cost	• High market demand of shrimp specially in international market • High growth potential • Opportunity of gender inclusion • Climate resilient

Potato

Systemic Constraints	Opportunities
• Disease resulting low production • Inefficient Post-harvest handling resulting wastage • Lack of quality seed resulting low production • Problems in Marketing and Storage	• High market demand for potato all-round the year as it is one of our main food • Introduction of different variety • Opportunity of gender inclusion • Opportunity of storage and processing

Poultry

Constrain	Opportunity
• Lack of access to different services including local hatcheries (for duckling), duck feed and disease management services like paravets/ vetenarians/ DLS (for vaccination; other preventive measures; medication) • Low volume production does not attract outside buyers for business • Lack of access to knowledge on improved production practices (duck feed; cage management; hatching; disease management; etc.)	• High market demand round the year • Opportunity of gender inclusion • Potential to Improve HH Income

5. Recommendations for the analyzed Value Chains for Shomoshti Project

Table of Contents

1. Generic Recommendations

1.1 Producer Group Formation and adopting Group based Approach

We strongly recommend to organize community-based producers' groups (PGs) for all the targeted subsectors. Average number of producers in each group should be 40 to 50, to utilize benefits like collective sales and purchase options. Besides poor farmers, membership should also be open to comparatively well off farmers and lead farmers in the community. This design will have potential to result in all-inclusive sectoral development in a specific region. In conventional groups as the non-poor are excluded from membership, these groups lack enough bargaining power to negotiate with the local power-holders and elites. At the same time, as elites are kept outside of the groups, they do not have any avenue for effective engagement with the group for attaining its development objective. But, if Shomushti groups include all willing farmers of the community, there is a very good opportunity for the all community members to contribute to positive sectoral development.

Executive Committee (EC) should be formed with credible, eligible and willing group members following democratic and participatory processes. Women participation should be ensured in these groups, and in respective ECs (Executive Committee). There has been a general perception that different subsectors (like aquaculture) is managed by men farmers. Whereas, women actively participate in different production related activities (like homestead irrigation, weeding, feed preparation, feeding cattle, milking, etc.), they do not participate in decisions regarding supply of inputs and selling of produce in markets. Though the project expects that women's bargaining power will be enhanced by facilitating participation of women in PGs in general and PG-ECs in particular, the project should also take this factor into consideration that a change in bargaining power among women within the context of a traditional society with huge power imbalance is

not an easy task. This is an outcome that may only be practically achieved in the long run. Therefore, women inclusion in the PGs and in the PG-ECs should be balanced and practical.

1.2 Promoting Lead Farmer as Focal point for Knowledge Dissemination and Group Mobilization

Lead farmers (LF) can be tagged with the PGs and promoted as the essential vehicle for attaining the project's objectives of increased productivity and better value chain. They can act as influential catalyst for group mobilization, technology adaptation and resulting behavioral changes. For each PG, one Lead Farmer from the community should be selected and tagged. In the piloting phase (may be in the first two years) project can give them a monthly honorarium. A generic LF selection process is illustrated below.

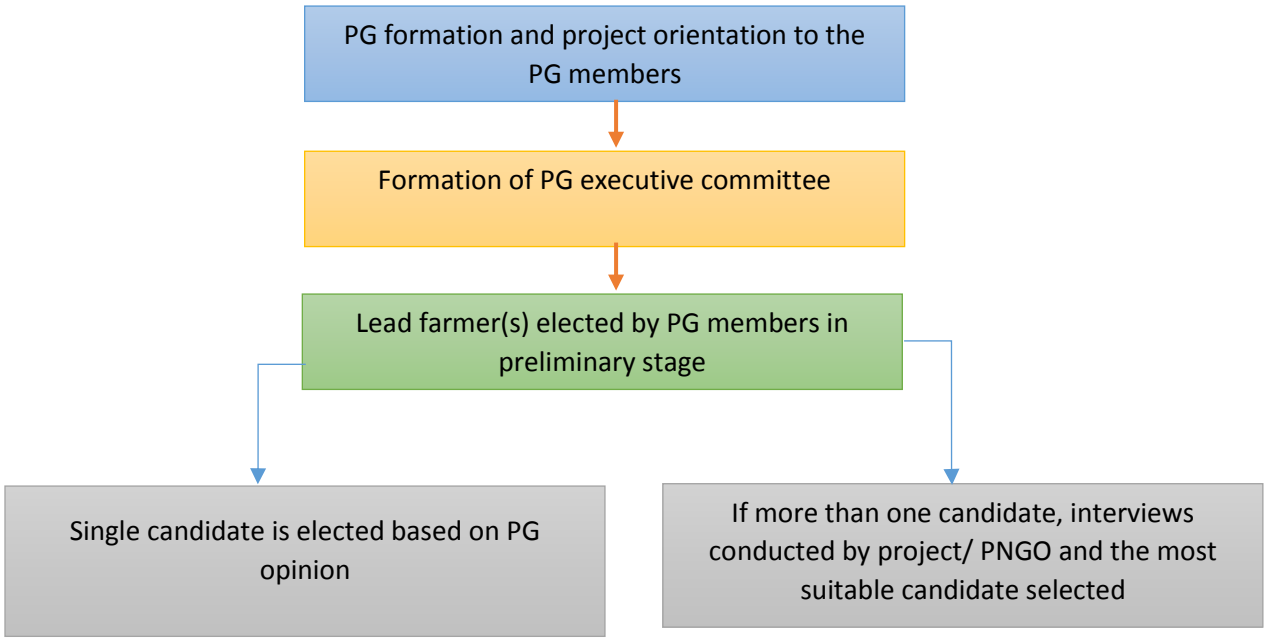


Figure: Selection Process of a Lead Farmer (LF)

The project has to train these lead farmers in entrepreneurship development, business management and business planning. LFs will also receive sub-sector specific extensive training and practical hands-on training through exposure visits /cross visits. Besides, periodic refresher training should also to be facilitated. For subsector related technical training, certified public and private training providers under TVET (Technical & Vocational Education & Training) programme should be used.

Technical skill areas where the project should focus during capacity development are described in the next section.

After receiving different trainings, LFs will then disseminate their learning among group members in multiple group sessions in an organized way. These LFs will be also be part of ECs and will have decisive power over group matters.

Figure: Expected Profile of a Successful Lead Farmer

It should be noted that lead farmers themselves may not be selected from the bottom tire of the society, rather they should be from the educated middle or upper middle strata of the community. Thus, they can effectively become the change-makers in their communities in both adopting and spreading new environment- friendly sustainable farming technologies and practices as well as bargaining with the market to get fair price of the produces.

Trained LFs will be accessible and can provide quality services on production related information, output and input market linkage, etc. From our previous research experience we found that successful LFs have so distinctive qualities or attributes that make them effective and popular. Usually they are socially respected, people's person, knowledgeable on production practices, has business incentives of their services, and have leadership quality. Existence of these qualities make them more credible, approachable and accessible to farmers. The figure above illustrates the expected attributes that a LF should have to become a successful and sustainable actor in the market system.

LFs who can leverage their popularity and access to community farmers in their own business in coming days or have enough incentives to continue their services, would probably be more sustainable actors in the market system.

1.3 Service Provider Development

Promoting and strengthening different service providers can be instrumental in bringing positive changes in farmer behavior, value chains, private sector transactions, business modalities, market governance, and most importantly, spreading or disseminating good practices among the whole community. Our previous research experience suggests that producers who have access to different relevant service providers have better market information, better knowledge about market demand and price, are producing according to market requirements and are getting comparatively better price for their products.

Type of service providers, entrepreneurs and skill laborers might differ from subsector to subsector. These service providers might include vegetables collector/ seller/ commission agent, community veterinary service provider (Dairy, Meat, Poultry), community milk transportation van (Dairy), fish feed processor (Aquaculture), vermin-compost producer (Vegetables, Fruit, Medicinal Plant), Agro-input shops and mobile input seller (Vegetables, Meat, Dairy, Poultry, Medicinal Plants), etc.

Subsector specific service providers that the project should promote are described in next section.

1.4 Output Market Linkage

One of the major systemic constraints that this study identified is lack of access to output market access. In most cases producers do not have the knowledge or access to large traders who have enough demand and will pay better price for their produce. They do not know about buyer's demand specifications and price offering and thus adopted below per production practices.

Therefore, linking PGs with profitable output market actors is a strongly suggested recommendation for the targeted subsectors in this project. Different approach can be adopted in this regard, including establishing collection point or center (vegetables; dairy; fruit), linking PGs with potential distant traders/ buyers (home and cottage; medicinal plant, poultry), etc.

Subsector specific recommendations are presented in the next section.

2. Subsector Specific Recommendations

Subsector specific recommendations have been determined based on our field findings (the constraints and opportunities described in our report), literature review and our consultants' experience in these sectors in the last decade.

2.1 Recommendations for Vegetable Subsector

Products:

South-West Region (Khulna): Tomato, Eggplant, cruciferous vegetables (cabbage; cauliflower; carrot; etc.)

North-East region (Sylhet): Tomato, French bean, Pumpkin and Radish
Northern region (Rangpur): Cabbage, Cauliflower, Brinjal, Arum

North West region (Rajshahi): Cabbage, Cauliflower, Radish, Bitter Gourd

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)
The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive sub-sector specific extensive training and practical hands-on training through exposure visits /cross visits. According to our findings on market constraints, major skill development areas include –

a) Business planning and business management
b) Use of improved seed varieties (HYV and Hybrid varieties); importance of using improved seed varieties, their usage and dosage
c) Use of chemical fertilizers
d) Use of micronutrients (in areas where there is nutrient deficiency in soil)
e) Benefits of using bio-fertilizers (quick compost; vermin-compost)
f) Application of bio-fertilizers; method of producing homemade bio-fertilizers (quick compost; vermin-compost)
g) Benefits of soil-testing
h) Importance and usage of environment friendly pesticide management technologies (e.g., sex pheromone traps, light traps, bio pesticides, etc.)
i) Post-harvest management processes (harvesting, washing, sorting, grading, packaging and transportation)

3.B Capacity Development of Producers
After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening
Different service providers that the project should promote or strengthen for this particular subsector are given below.

a) Vegetables Collector or Seller (commission agent)
   - For PGs/ farmers who live in comparatively remote peripheries and there is no nearby sales outlet, new vegetable collectors or sellers should be developed. These collectors/ sellers can sell those to different distant traders or can link PG members with traders. In both case, they will enjoy a commission from each sale.
   - For PGs/ farmers who have easier access to nearby haats or bazars, capacity of existing vegetable sellers can be enhanced by linking them with large/ distant/ institutional buyers

b) Vermin compost producer
   - This is low cost technology which can significantly increase productivity and decrease chemical fertilizer cost. Vermin compost producer should be developed

who will sell both compost and vermin (to those who are interested to produce this compost at their house) to producers

c) Agro-input shops
   - Small agro input shops can be set up in the communities which will be run by community member(s). Farmers can buy improved seed varieties, bio-fertilizers, micro-nutrients, bio-pesticides like sex pheromone traps, etc from these shops.

d) Local Soil-testing service provider
   - Because soil-testing service by DAE is time consuming and not available in all areas, the project should explore possibilities of introducing local low-cost mobile soil testing facilities. Grameen Intel's '*Mrittika*' can be a potential solution in this regard (http://www.grameen-intel.com/news/grameen-intel-provides-3-mrittika-software-with-soil-testing-kits-at-rangpur-300-farmers-would-be-benefited/).

e) Irrigation Service Provider (only for North-East region)

5. Output Market Linkage

a) Collection points (CP) need to be established in villages/ communities where there is no market to sell output or market is far away from the village. Collection Point (CP) is one type of selling arrangement where different vegetable products produced by the farmers are assembled in a selective place of nearby farm gate on specific day and time and selling their product to different remunerative buyer and price set up with burgeoning. In consultation with sellers (farmers) and buyers (traders), the location of CP should be selected for the convenience of both parties (i.e. reduced logistical and transactional costs etc.). Women, particularly those whose husbands are out of village or are physically impaired, are supposed to be more active in transaction through the CP.

b) Identify and create linkage between PGs or Vegetable Sellers and large/ institutional buyers (like Agora; Shopno; etc.) as they provide better price for horticulture products. This will provide farmers with demand side specifications and requirements and push them to further improve their production practices.

c) Identify and create linkages with potential agro-processing entrepreneurs who would be interested in establishing vegetable processing (frozen and canned) plants to ensure steady market for horticulture products.

2.2 Recommendations for Medicinal Plant Subsector

Region:
Northern region (Rangpur) and
North West region (Rajshahi)

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)

The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive sub-sector specific extensive training and practical hands-on training through exposure visits /cross visits. Government formed a cell for medicinal plant in the 'Ministry of Environment and Forest'. The cell is working in different dimension for developing the medicinal plant sector. Assistance of this cell should be taken for technical training provision.

According to our findings on market constraints, major skill development areas include –

a) Business planning and business management
b) Business potential and viable business model
c) Identification and traditional knowledge of Medicinal plants
d) Production practices of selected medicinal plant
e) Necessary inputs, their dosage and usage
f) Post-harvest management medicinal plants
g) Value addition/semi processing of medicinal plants (For example Preparation of Aloe vera juice, jel & face cream)
h) Quality assurances, distillations & extraction process of aromatic oils.

3.B Capacity Development of Producers

After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Linkage with Local Govt. Body and Mainstreaming Indegenous Practice of MP Cultivation

a) Government formed a cell for medicinal plant in the 'Ministry of Environment and Forest'. The cell is working in different dimension for developing the medicinal plant sector. Support should be taken from this cell regarding capacity development
b) Facilitate linkage with local govt. body or union council to allocate roadside and other fallow land to Medicinal Plant Producer Groups.
c) Prepare local context based database to assess the current quantity of each medicinal plants and identify more kinds of medicinal plants in further areas.

5. Service Provider Development/ Strengthening

Different service providers that the project should promote or strengthen for this particular subsector are given below.

a) Development of medicinal plants (MP) Nursery and input supplier
   - Medicinal plant cutting/sapling are not available in traditional nurseries and govt. nurseries can't reach up to the rural area. Commercial MP cultivation require regular source of input like sapling/seed/ cutting which portrays the demand of development of MP nursery. Farmers can buy compost/ bio-fertilizers from producers developed and promoted by the project among the community members.

b) Medicinal Plant Collector (commission agent)
   - Medicinal Plants are mainly used as raw material of pharmaceutical or cosmetic products and relevant industries require bulk amount which is difficult for a single producer to provide that's why MP collectors should be developed. These collectors can work as company (e.g., Acme, Square, other Ayurvedic companies, etc.) agents or can link PG members with companies. In both case, they will enjoy a commission from each sale.
   - Capacity of existing local medicinal plant traders can be enhanced by linking them with large/ distant/ institutional buyers based in Chowkbazar, Dhaka.

7. Output Market Linkage (e.g., with Ayurvedic companies)

a) PGs/ producers should be linked with Ayurvedic companies or medicinal plant processors and contract farming model can be initiated. Output actors will place order of specific products to growers before the season, specify their required produce features and set price for the product (Helvetas-Acme Pharmaceutical partnership). Buyer can also provide different kinds of technical and financial support to contracted farmers.

b) Identify and create linkage between PGs /growers and medicinal plant traders based on large wholesale markets, like Moulavi-bazar at Chowk bazar

2.3 Recommendations for Hand Stitch Subsector

Region: South-West Region (Jessore)

NB: In general Sylhet region does not have prominent example of hand stitching entrepreneurship or work; rather hand weaving work is done by their indigenous 'Monipuri' community.

1. Producer Group (PG) formation

2. Group Leader (GL) selection

3. Capacity Development of Producers and Group Leader

3.A Product and Skill Development Training

Hand stitch is an off-farm sector and producers require hands on training to make quality products. According to our findings on market constraints, major skill development areas include –

- Embroidery tools & equipment.
- Application of sewing and embroidery machine
- Various stitches of hand embroidery-their techniques and applications.
- Selection of threads & needles according to the texture and fiber of the material
- Latest design collection and tracing technique.

- Uses and application of shade work, applique work, cut work etc.
- Making diversified product like hand bag, cap etc.
- Post production works like ironing, finishing, and framing of the embroidered articles.

3.B Business Improvement and Knowledge Dissemination Training

- The selected group leaders (GLs) have to be trained in entrepreneurship development, social media marketing, business management and business planning. GLs will also receive theoretical and practical hands-on training through exposure visits /cross visits.
- After receiving trainings on the above-mentioned areas, GLs will then disseminate their knowledge among their group members in multiple group sessions in an organized way

4. Service Provider Development/ Strengthening

Different service providers that the project should promote or strengthen for this particular subsector are given below.

- **Low cost input supplier**

- Develop input supplier in the producer community by facilitating linkage with wholesale input supplier especially fabric supplier. Thus producers can buy large quantity quality fabrics in comparatively low cost.

- **Quality Enhancement Service Provider**

- Develop some group members to provide quality enhancement service like over-locking embroidery by automatic machine and ironing.

- **Sales Intermediary Development**

- An intermediary can be developed who will act as the information and sales hub between buyers and hand stitch producers. These intermediaries will provide buyer demand specifications to producers (design specifications), and after production will deliver stitched products to buyers. For each sale, they will enjoy a certain commission for their business viability.

5. Output Market Linkage

- Link PGs/ trained producers with regional hand stitched cloth buyers or fashion houses (like Arong, Probortona etc.) who have a regular large order amount and provide better price for their products.

- Identify and create linkages with potential social media/ online based entrepreneurs

- PGs' own outlet/showroom can be established in cities like Jessore or nearbt divisional hub by facilitating and encourage them to grow as not only producer but also entrepreneur.

2.4 Recommendations for Crab Subsector

Region: South-West Region (Satkhira)

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)
The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive sub-sector specific extensive training and practical hands-on training through exposure visits /cross visits. According to our findings on market constraints, major skill development areas include –

- Introduction of cage cultivation of crab
- Water quality management
- Proper stocking and feed management techniques
- Proper harvesting time and technique
- Importance of market information regarding demand and price situation
- Importance and process of post-harvest management etc.

3.B Capacity Development of Producers
After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Facilitate Linkage with relevant Public sector actors to Ensure Collective Access to Resources

-Facilitate linkage with government bodies like upazila administration to ensure access to open water bodies like Jolmohal, Khas land etc. as and ensure a better synergy with govt. initiative for landless/vulnerable community. (Cage Crab Culture project funded by Prime Minister's Office, implemented by Upazila Administration for poor small indigenous community in Shyamnagar, Shatkhira would be a model)

5. Facilitate Linkage with Private Sector Stakeholder for Capital Input Support

-Facilitate linkage with private sector stakeholder like RFL, Bengal Plastic or so on for ensuring easy access to capital instruments (plastic cage for each crab, GI pipe) which costs major portion of initial investment. Producer group can be benefited by getting these items in EMI or discounted price or under Corporate Social Responsibility (CSR) program of the

partner companies. (Export oriented vegetable producers and traders collaboration with plastic crate producing companies can be an ideal model for this intervention.)

6. Access to Finance

- Facilitate linkage with SME loan service providing financial institutions (Bank/MFI) as crab fattening requires comparatively medium to large initial investment.

7. Service Provider Development / Strengthening

Different service providers that the project should promote or strengthen for this particular subsector are given below.

a) Crab Nursery

- Facilitate linkage with development organizations like PKSF and 'Nowbeki Gonomukhi Foundation' to ensure access to their experience and benefits of action research on crab hatchery establishment. More precisely develop partnership with them for their technology adoption (transfer).

8. Output Market Linkage

a) Collection points (CP) need to be established in villages/ communities where there is no market to sell output or market is far away from the village. Collection Point (CP) is one type of selling arrangement where different vegetable products produced by the farmers are assembled in a selective place of nearby farm gate on specific day and time and selling their product to different remunerative buyer and price set up with burgeoning. In consultation with sellers (crab producers) and buyers (traders), the location of CP should be selected for the convenience of both parties (i.e. reduced logistical and transactional costs etc.).

b) Identify and create direct linkage between PGs/ crab producers and exporters/ processors as they provide better price for horticulture products. This will provide farmers with demand side specifications and requirements and push them to further improve their production practices.

2.5 Recommendations for Hand Weaving Subsector (Satranji)

Region: Northern region (Rangpur)

1. Producer Group (PG) formation

2. Group Leader (GL) selection

3.A 3. A Product and Skill Development Training

Hand weaving is an artisan or producer centric sector where inherited experience is one of the major criteria of engagement as a producer or apprentice. It require hands on training to

make quality products. According to our findings on market constraints, major skill development areas include –

- Hand weaving tools & equipment.
- Application of different patterns and techniques
- Selection of threads according to the texture and fiber of the material
- Latest trend of house decorating items,
- Product diversification like foot mat, decorative wall mat, slipper, bag etc.
- Application of locally available mechanized technology instead of laborious manual technology
- Quality improvement and post production works cleaning.

3.B Business Improvement and Expansion Training

- The selected group leaders (GLs) have to be trained in entrepreneurship development, social media marketing, business management and business planning. GLs will also receive theoretical and practical hands-on training through exposure visits /cross visits.
- After receiving trainings on the above-mentioned areas, GLs will then disseminate their knowledge among their group members in multiple group sessions in an organized way

4. Service Provider Development/ Strengthening

Different service providers that the project should promote or strengthen for this particular subsector are given below.

a) Low cost input supplier

- Develop input supplier in the producer community by facilitating linkage with wholesale input supplier to ensure access to comparatively low cost input item like Shanel (yarn) from domestic sources instead of imported sources.

b) Sales Intermediary Development

- An intermediary can be developed who will act as the information and sales hub between buyers and hand weavers. These intermediaries will provide buyer demand specifications to producers (design specifications), and after production will deliver weaved products to buyers. For each sale, they will enjoy a certain commission for their business viability.

5. Facilitate Access to Finance

- Facilitate linkage with SME loan service providing financial institutions (Bank/MFI) for technological up-gradation like replacement of manual machine with motorized machine and setting up own trade wing or show room.

6. Output Market Linkage

- Identify and create linkage between PGs and high-end national and export markets; promotion of 'hand-woven, indigo colored carpets/rug' should have promising market potential as there is a good overseas demand of these items.

- Identify and create linkages with potential social media/ online based entrepreneurs

- PGs' own outlet/showroom can be established in cities like Jessore or nearbt divisional hub by facilitating and encourage them to grow as not only producer but also entrepreneur.

2.6 Recommendations for Duck Subsector

Region: Sylhet

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)
The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive sub-sector specific extensive training and practical hands-on training through exposure visits /cross visits. According to our analysis on market constraints, major skill development areas include –

j) Business planning and business management
k) Production practice of high yield duck species (Khaki Campbell, Indian Runner, Jinding, Peiking or Beijing and Muscovy); importance of rearing high yield species, comparison of benefit of traditional and high yield species
l) Scientific feeding practice, its importance and nutrient requirement of duck feed
m) Improved production practice (duck feed; cage management; hatching); from traditional to scientific cultivation and its financial value
n) Disease management
o) Sales practices (meat and egg)

3.B Capacity Development of Producers
After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening
Different service providers that the project should promote or strengthen duck subsector are given below.

a) Egg and Live Duck Collector or Seller (commission agent)
   - For PGs/ duck farmers who live in comparatively remote peripheries and there is no nearby sales outlet, new duck and egg collectors or sellers can be developed.

These collectors/ sellers can sell duck and egg to different distant traders or can link PG members with traders. In both case, they will enjoy a commission from each sale. Collectors will go to remote places at least thrice in a week to collect live duck and eggs.

- For PGs/ farmers who have easier access to nearby haats or bazars, capacity of existing duck and egg sellers can be enhanced by linking them with large/ distant/ institutional buyers.

b) Community Livestock and Poultry Service Provider (CLPSP) development
   - Because service by DLS is time consuming and not available in all areas, the project should explore possibilities of develop local paravet. Project can give special training to the already existing local paravets or develop paravets as Community Livestock and Poultry Service Provider (CLPSP) who will provide veterinary services to both cattle and poultry producers. These CLSPSs should receive detailed training from relevant training veterinary training providers like DLS (Department of Livestock), Veterinary Training Institutes, etc.

5. Linkage with Duck Hatcheries

a) Hatcheries have the advanced techniques to hatch eggs in appropriate manner to reduce mortality rates which is more difficult for small farmers to follow in-house due to limited knowledge and equipment. We found that targeted farmers in Sylhet region are mostly dependent on their commonly found low quality duck breeds and traditional in-house hatching techniques with higher mortality rates and lower profit. So project can take initiative to develop hatchery as well as egg, duckling and pullet seller.

6. Output Market Linkage

b) Identify and create linkage between PGs or Duck and Egg Sellers and local hotel and restaurants.

c) Identify and create linkage between PGs or Duck and Egg Sellers and large retail chains like Shopno or Agora.

2.7 Recommendations for Beef Fattening Subsector

Region: Khulna and Rajshahi

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)

The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive beef fattening related extensive training and

practical hands-on training through exposure visits /cross visits. According to our analysis on market constraints, major skill development areas include –

a) Business planning on beef fattening
b) Business cycle and Return on investment calculation
c) Cattle breeds that yield maximum profitability in a shorter business cycle
d) Preparation of improved homemade concentrates
e) Standard feeding practice, nutrient requirement for optimum fattening
f) Improve shed management and husbandry practices
g) Disease management (vaccination; deworming; preventive measures; medication)
h) Disadvantage of using steroid and other unauthorized ingredient for beef fattening
i) Requirements of meat processing companies/ institutional buyers about the quality specifications

3.B Capacity Development of Producers

After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening

Different service providers that the project should promote or strengthen beef fattening subsector are given below.

a) Input Shops
   - Although household are mostly involved in cattle feeding, due their social reasons their mobility is restricted and that's why input/ feed purchase is mostly handled by male members. Besides, it is cost and time consuming to go to distant haats/ bazars for feed purchase. Therefore, input shops can be set up in the communities which will be run by community member(s). Beef fattening farmers can buy improved feeds and deworming capsules and other necessary inputs from these shops. The same shop can also sell agro inputs for enhancing business viability.

c) Community Livestock and Poultry Service Provider (CLPSP) development
   - Because service by DLS is time consuming and not available in all areas, the project should explore possibilities of develop local paravet. Project can give special training to the already existing local paravets or develop paravets as Community Livestock and Poultry Service Provider (CLPSP) who will provide veterinary services to both cattle and poultry producers. These CLSPSs should receive detailed training from relevant training veterinary training providers like DLS (Department of Livestock), Veterinary Training Institutes, etc.

5. Linkage with High yield beef cattle breeds

a) For optimum beef productivity within a smaller business cycle, producers should be linked with improved cattle breeds.

6. Output Market Linkage

a) Identify and create linkage between PGs and institutional buyers like Bengal Meat or Retailers like Shopno and Agora.

2.8 Recommendations for Dairy Subsector in Sylhet area

Regions: Rangpur

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)
The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive dairy related extensive training and practical hands-on training through exposure visits /cross visits. According to our analysis on market constraints, major skill development areas include –

a) Business planning on dairy production
b) Business cycle and Return on investment calculation
c) Dairy cattle breeds (artificially inseminated) that yield maximum milk production and profitability
d) Importance of improved grass feeding (like napier, jumbo varieties)
e) Improved grass production practices
f) Preparation of improved homemade feeds
g) Balanced dietary requirements; standard feeding practice, nutrient requirement for optimum fattening
h) Improve shed management and husbandry practices
i) Disease management (vaccination; deworming; preventive measures; medication)
j) Sales (as per fat content)

3.B Capacity Development of Producers
After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening
Different service providers that the project should promote or strengthen dairy subsector are given below.

a) Input Shops
   - Although household are mostly involved in cattle feeding, due their social reasons their mobility is restricted and that's why input/ feed purchase is mostly handled by male members. Besides, it is cost and time consuming to go to distant haats/ bazars for feed purchase. Therefore, input shops can be set up in the communities which will be run by community member(s). Dairy farmers can buy improved feeds and deworming capsules and other necessary inputs from these shops. The same shop can also sell agro inputs for enhancing business viability.

b) Community Livestock and Poultry Service Provider (CLPSP) development
   - Because service by DLS is time consuming and not available in all areas, the project should explore possibilities of develop local paravet. Project can give

special training to the already existing local paravets or develop paravets as Community Livestock and Poultry Service Provider (CLPSP) who will provide veterinary services to both cattle and poultry producers. These CLSPSs should receive detailed training from relevant training veterinary training providers like DLS (Department of Livestock), Veterinary Training Institutes, etc.

5. Linkage with quality AI (Artificial Insemination Service)

a) Link farmers with AI services from where they will get better and trusted insemination service.

6. Output Market Linkage

a) Linking farmers with milk chilling centers/ collection points that are linked with chilling centers. Because chilling centers pay according to fat content and milk amount, this will push farmers to achieve higher milk production and fat content and therefore, to improve their production practices accordingly.

2.9 Recommendations for Tailoring Subsector

Region: Rajshahi

1. Producer Group (PG) formation

2. Lead Tailor (LF) selection

3.A Capacity Development of Lead Tailor

The selected Lead Tailors have to be trained in entrepreneurship development, business management and business planning. LFs will also receive tailoring related extensive training and practical hands-on training through different training providing agencies both government and private. Develop linkage with Department of Women Affairs and Department of Youth Development for tailoring related specific courses can make a special impact on this subsector. According to our findings on market constraints, major skill development areas include –

a) Business planning and business management
b) Modern tailoring technique
c) Latest fashion trend
d) Entrepreneurship development
e) Output market actors and channels

3.B Capacity Development of other beneficiaries/ producers

After receiving trainings on the above-mentioned areas, Lead Tailors will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening

a) Machine Repairer Development

- Access to the repair services was also found limited. At present, this service is provided by very few local level service providers who do not have expertise on tailoring machines. Local level machine repairer can be developed. Lead Tailor can also be trained on machine repairing who will sell this this service in the community.

b) Sales Intermediary Development
   - An intermediary can be developed who will act as the information and sales hub between buyers and tailors. These intermediaries will provide buyer demand specifications to tailors (design specifications), and after production will deliver tailored clothes to buyers. For each sale, they will enjoy a certain commission for their business viability.

5. Output Market Linkage

a) Link PGs/ trained tailors with regional large tailored cloth buyers or fashion houses who have a regular large order amount and provide better price for their products.

Based on our observation and findings, with all kinds of suggested intervention, tailoring product cannot compete with ready-made garments product especially in terms of price. So we do not recommend to consider this as a potential value chain for implementation.

2.10 Recommendations for Fruit Subsector (Lemon and Pineapple)

Region: Sylhet

1. Producer Group (PG) formation

2. Lead Farmer (LF) selection

3.A Capacity Development of Lead Farmers (LFs)

The selected LFs have to be trained in entrepreneurship development, business management and business planning. LFs will also receive fruit specific extensive training and practical hands-on training through exposure visits /cross visits. According to our findings on market constraints, major skill development areas include –

u) Business planning and business management
v) Use of improved fruit seed varieties (HYV and Hybrid varieties); importance of using improved seed varieties, their usage and dosage
w) Use of chemical fertilizers
x) Application and benefits of using bio-fertilizers
y) Benefits of soil-testing
z) Disadvantage of excessive use of hormone in pineapple production
aa) Fruit damage protection technique
bb) Importance and usage of environment friendly pest management technologies

cc) Post-harvest management processes (harvesting, washing, sorting, grading, packaging and transportation)
dd) Return on Investment calculation

3.B Capacity Development of Producers

After receiving trainings on the above-mentioned areas, LFs will then disseminate their knowledge among their group members in multiple group sessions in an organized way.

4. Service Provider Development/ Strengthening

Different service providers that the project should promote or strengthen for this particular subsector are given below.

g) Fruit Collector or Seller (commission agent)
   - For PGs/ farmers who live in hilly remote places and there is no nearby sales outlet, new fruit collectors or sellers should be developed. These collectors/ sellers can sell those to different distant traders or can link PG members with traders. In both case, they will enjoy a commission from each sale.
   - For PGs/ farmers who have easier access to nearby haats or bazars, capacity of existing fruit sellers can be enhanced by linking them with large/ distant/ institutional buyers

h) Agro-input shops
   - Small agro input shops can be set up in the communities which will be run by community member(s). Farmers can buy improved seed varieties, sapling, organic fertilizers, compost, medicine, hormone, spraying machine, etc. from these shops.

i) Irrigation Service Provider
   - Big farmers cultivate fruit through the irrigation process. Getting water through pumping is very expensive small farmer does not use the irrigation facility and depend on rainwater. So project can take initiative to develop irrigation service provider by providing pumps, pipes and other logistical support.

5. Output Market Linkage

i) Facilitate linkage with high-end and general forward market. Project can emphasize on direct sale in Dhaka through existing Dhaka Party or formalization of existing trader.

j) Collection points (CP) need to be established in villages/ communities where there is no market to sell output or market is far away from the paras. Collection Point (CP) is one type of selling arrangement where different fruit products produced by the farmers are assembled in a selective place of nearby farm gate on specific day and time and selling their product to different remunerative buyer and price set up with burgeoning. In consultation with sellers (farmers) and buyers (traders), the location of CP should be selected for the convenience of both parties (i.e. reduced logistical and transactional costs etc.).

k) Identify and create linkage between PGs or fruit Sellers and large/ institutional buyers as they provide better price for fruit products. This will provide farmers with demand side specifications and requirements and push them to further improve their production practices.

l) Identify and create linkages with potential agro-processing entrepreneurs who would be interested in establishing pineapple processing (juice, frozen or canned) plants to ensure steady market for pineapple products.

6. Recommended Region wise List for Shomoshti Sub-Sectors

Rangpur	Bogra/ Rajshahi	Khulna	Sylhet
Cotton crafts (karchupi)	Cotton craft (Tailoring, hand stitch)	Cotton craft: (hand stitch, dyeing, block print)	Handicraft: (hand loom)
Vegetable	Vegetable	Vegetable	Vegetable
Dairy	Medicinal plant	Crab Fattening	Lemon/Pineapple
Poultry	Beef / Goat Fattening	Dairy	Duck/poultry
Medicinal plant	Dairy	Beef Fattening	Fish
	Handicraft (bamboo & cane)	Handicraft (bamboo & cane)	

Selected Value chain

1. Cotton crafts: (hand Stitch, embroidery, tailoring, Dyeing, Karchupi, block print etc)
2. Handicrafts, (bamboo & cane, hand loom)
3. Vegetable
4. Lemon & Pineapple
5. Crab Fattening
6. Duck /poultry
7. Medicinal plant
8. Dairy
9. Beef / Goat Fattening
10. Rice
11. Jute
12. Fish