



Report

on

Offal Utilization Component

under

Agribusiness Trade Competitiveness Project (ATC-P)

of Ministry of Commerce

implemented by BSFF with support from SwissContact (Katalyst)

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**Prepared
by**

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Contents

1	Foreword from Chairperson of Bangladesh Shrimp and Fish Foundation	3
2	Introduction	4-5
3	Key questions addressed in the present report	5-16
4	Annexures	17-27



Foreword

Fisheries and aquaculture sector is potentially one of the most important sectors in the economy of Bangladesh with its contribution to national GDP, country wide income and employment generation which consistently have been remarkable during the recent years. The sector is still, however, not operating to its maximum potential and Bangladesh may significantly gain in terms of added growth momentum if the sector becomes the focus of targeted enhanced investment, introduction of new technologies and production methods and bio-security measures to ward off risk to the sector due to diseases. The Govt. of Bangladesh has prioritized the development of the sector and wide ranging initiatives are being contemplated to impart new dynamism to the sector. Recently, attention has also been drawn to important contribution which the development of fisheries' and aquaculture sector may make to the achievement of the SDGs.

Bangladesh Shrimp and Fish Foundation (BSFF) have been working very closely with the Govt. of Bangladesh to accelerate growth in the fisheries and aquaculture sector. The various initiatives of the Foundation have covered traditional areas of growth acceleration, namely, through introduction of Good Aquaculture Practices (GAP), making available good seeds and feeds and introduction of compliant best practices both at the farm and processing plant level. The Foundation has also initiated important work with the Ministry of Commerce, Department of Fisheries and Katalyst to realize the hitherto unexploited potential of 'crating value for the wastes' by introducing value added products from the fisheries and aquaculture sector and utilization of offal. It is possible that by a better management and utilization of offal for commercial purposes as well as introducing value added products, the contribution of fisheries and aquaculture sector in Bangladesh can be enhanced significantly.

The present report on a first initiative of its type on offal utilization in Bangladesh-present reality, challenges and prospects shed light on how Bangladesh can benefit from targeted future initiatives to utilize offal and introduce value added products. The output from the work reflected in the report merits to be given due consideration. BSFF undertook the just concluded phase of its work on offal utilization with very limited resources and within a very short time frame. It would be important to carry forward the important work in this area with greater investment, resources and initiatives. BSFF is especially grateful to Ministry of Commerce, Business Promotion Council (BPC), Department of Fisheries and Katalyst for their valuable assistance and support that made the present study on offal possible.

We hope, our effort on the present work on offal would be of use for all our policy makers, private sector stakeholders and other important partners working to increase growth and development in the Bangladesh fisheries and aquaculture sector.

Syed Mahmudul Huq

Chairman,

Bangladesh Shrimp and Fish Foundation



Report on Offal Utilization Component of

Introduction

Fisheries play a significant role in Bangladesh in providing 63% of the animal protein and direct or indirect employment for 15 million people. Out of total fish production of 3.26 MMT, about 2.2 MMT fishes (70%) are used for human consumption and rest 1 million metric tons (30%) are being discarded every year as Offal in terms of fins, scale, tails, guts, shell, bones, skull, viscera, etc. The shrimp export from Bangladesh amounts to about 55,000 tons; but the heads and/or shells are currently discarded or sold at a low value (UNU-FTP, 2013). Currently, the aquacultured fish products are exported as gutted, headless or whole fishes. In 2010-11 about 1.5 million MT fish came from aquaculture origin where 2 Million MT fish feeds were used. About 300 thousand MT fish meals (20% of total ingredients) being used to produce 2 Million MT fish feeds that cost TK 16.50 billion. Survey reveals that proper initiative can help to produce 200 thousand MT fish meals by using 1 million MT discarded raw materials and can earn TK 11.00 billion/year. That will help to reduce import pressure of TK 18.00-20.00 billion that have to be spent to import meat & bone meal.

Present fish production of Bangladesh is more than 3.26 million metric tons (DoF 2013), of which 1.73 million metric tons (DoF, 2013) fish comes from aquaculture sources. But the problem is, the production cost is too high to survive in this business due to low quality of fish feed that have feed the fish. Farmers reported that the 2 kg Pangus fish feed were required to produce 1 Kg marketable Pangus only and its production cost was 80-85 tk. Whereas, the farm gate price of Pangus is highest at 80tk ($\pm$). It is quite absurd to sustain this business if the fish feed cost is not reduced. There should be some value added activities for Pangus and Tilapia which contribute about 60% of total fin fish aquaculture production. It has been recognized that proper use of offal can increase the competitiveness and growth of aquaculture sector in Bangladesh. There must be an outlet for the by-products thus created, such as heads, frames, skin and viscera and studies should be carried out on the by-product utilization and marketability of the products (UNU-FTP 2013). Offal is a suitable source of fish meal and fish



oil which are used in fish feed industry to produce quality fish feed. Several studies proved that quality fish feed (fish meal based 35% protein enriched feed) can reduce Food Conversion Ratio (FCR) from 2:1 to 1.2 :1 which in its turn helps to reduce production cost, e.g., Pangus from TK 80 to TK 60/kg. Same theory is applicable to Tilapia, Koi and other aquaculture species. When FCR is reduced, the production cost is automatically reduced and the farmers will regain their confidence to produce more fishes, thus also helping to increase profit margin.

There are, it has been observed, opportunities to increase the value of the export by further diversification and the production of higher priced fillets or fillet portions (UNU-FTP 2013). An expert team of UNU-FTP of Iceland, after conducting a fact-finding mission, recommended to conduct **a comprehensive study of the supply of offal – where does it originate, how it is handled, what does it consist of and what is the quantity and how much does it fluctuate over time?** It also recommended **to organize training programs for the Bangladeshi fish/shrimp exporting industry on better utilization of by-products and value addition.** The training programs, it was recommended, should be designed to demonstrate the concept and potential in value addition within the fish processing and utilization of waste products for production of by-products. They also recommended **to conduct a study on the investment potential within the fisheries and aquaculture sector** with the aim to improve the competitiveness of the export industry. Subsequently, the program should include some pilot project demonstrating on the production of fish meal and fish oil, using offal and link these facilities with Fish Feed Producing industry, should be conducted. To ensure the quality of the fish meal & fish oil, lab testing facilities should also be introduced.

Key questions addressed in the present report

Under the present ATC-P project, BSFF commissioned a study pursuant to the first recommendation mentioned above and in this study the following 5 research questions (RQs) were posed with special reference to the shrimp production in Bangladesh:

RQ.1. Where does the raw material originate and its amount?

RQ.2. How the raw materials are currently handled?

RQ.3. what constitutes the raw material?

RQ.4. How does the supply of raw material and offal fluctuate over time?

RQ.5. Conduct the lab tests for knowing its quality and contaminants, if there any

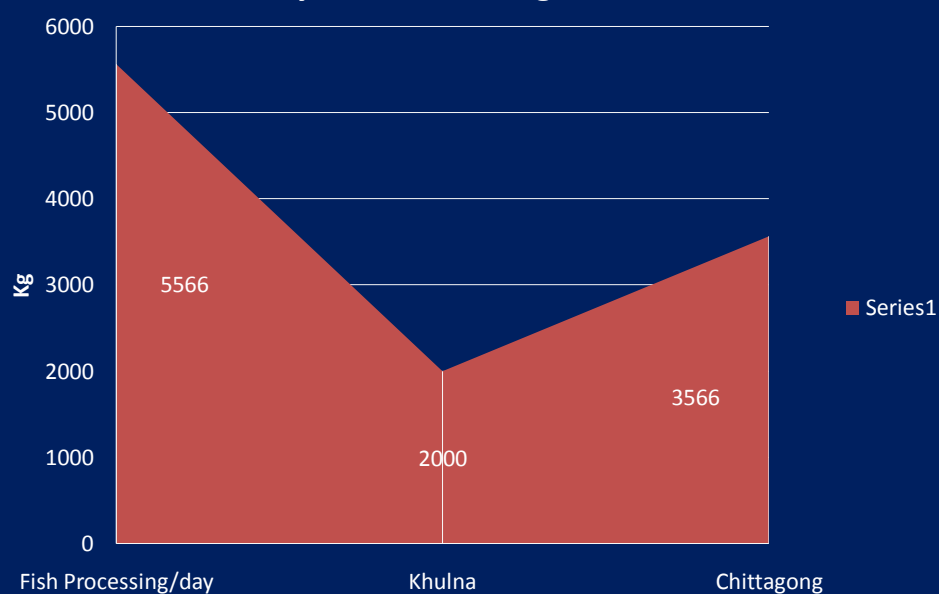


Preparatory work on the study consisted of collection of quantitative and qualitative data from processing plants in Khulna and Chittagong region. The study has been completed and it provides a rich insight into the present state of use of offal in the shrimp industry which are summarized below:

Findings: General

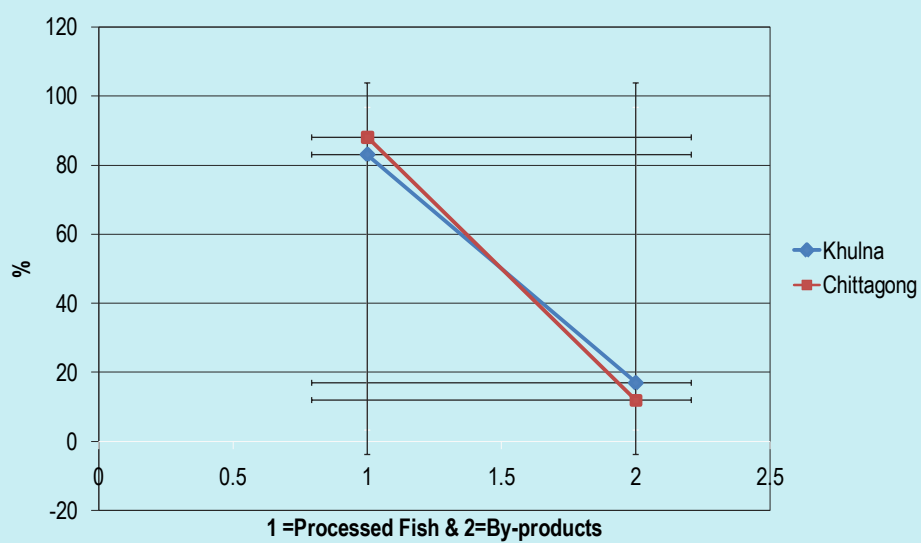
- ❑ Currently 78 processing plants are under operation
- ❑ 41 in Khulna and 32 in Chittagong region
- ❑ Average Fish processing/day/factory: 2000kg in Khulna of which, 75% Fish slice/block/steak and 25% whole frozen/degutted, etc.
- ❑ 3566 kg/day/factory in Chittagong of which, 30% Fish slice/block/steak and 70% whole frozen/degutted/de-scaled
- ❑ By-products produced 16.67% in Khulna and 12.49% in Chittagong
- ❑ Average production of by-products /day from 41 PP in Khulna is 16.4 MT
- ❑ Average production of by-products /day from 32 PP in Chittagong is 16.3 MT

Per day Fish Processing in KLN, CTG

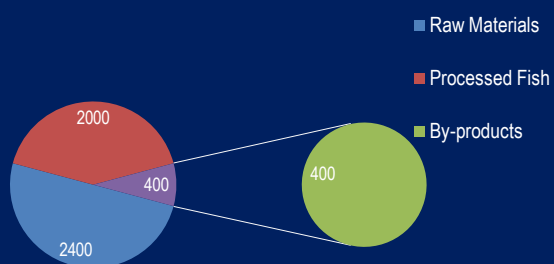




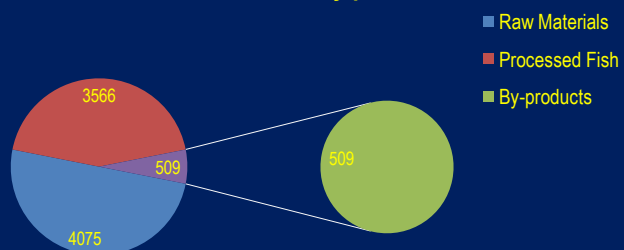
Processed Fish vs By-products

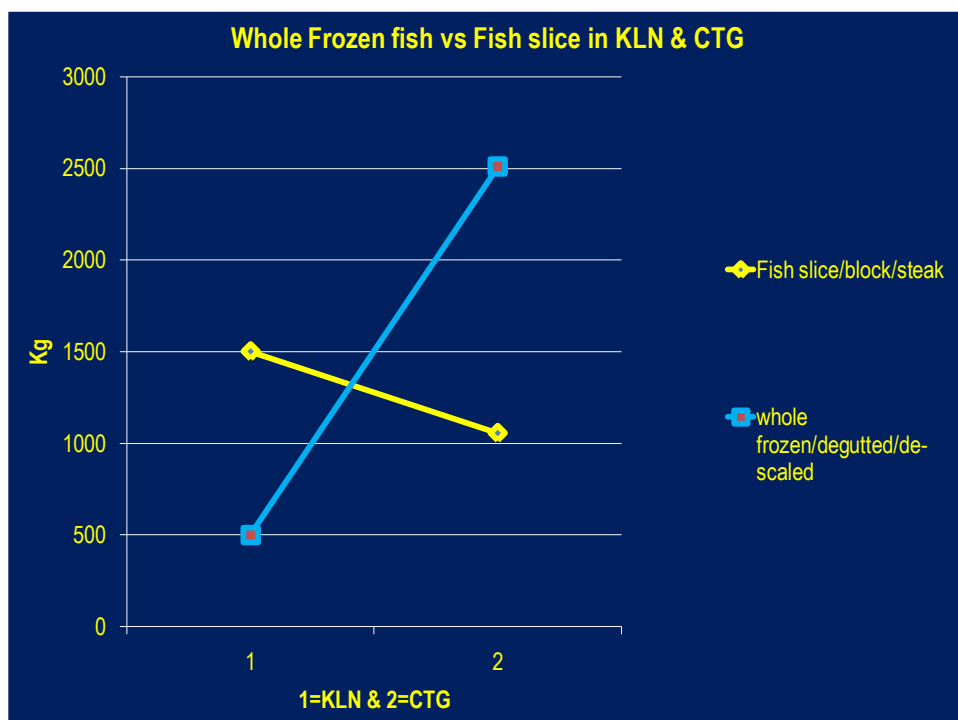


Raw Materials to By-products ,KLN



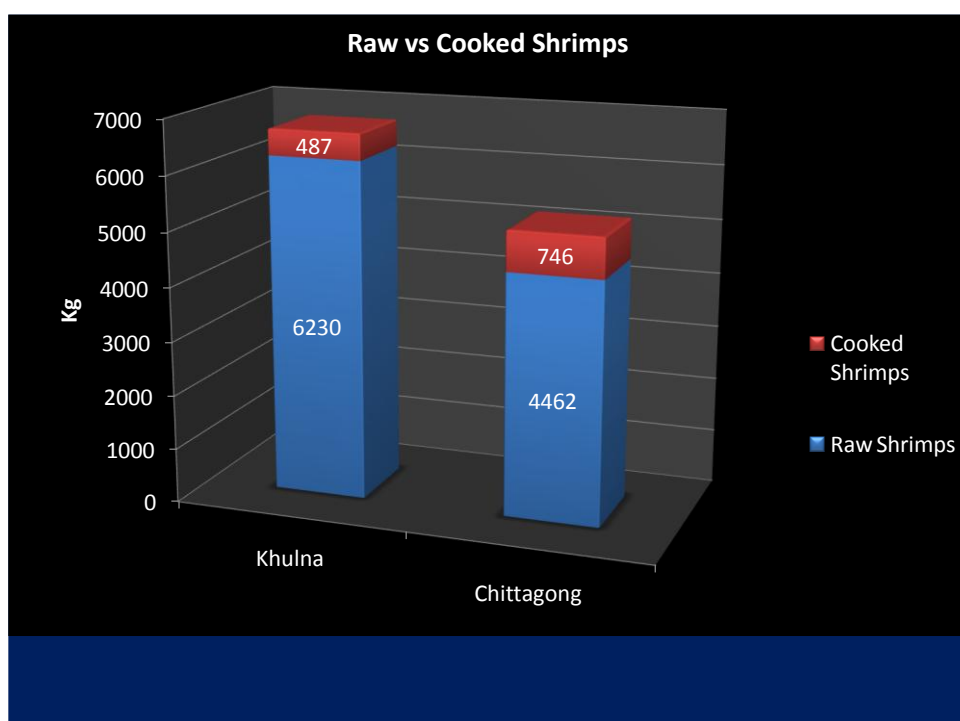
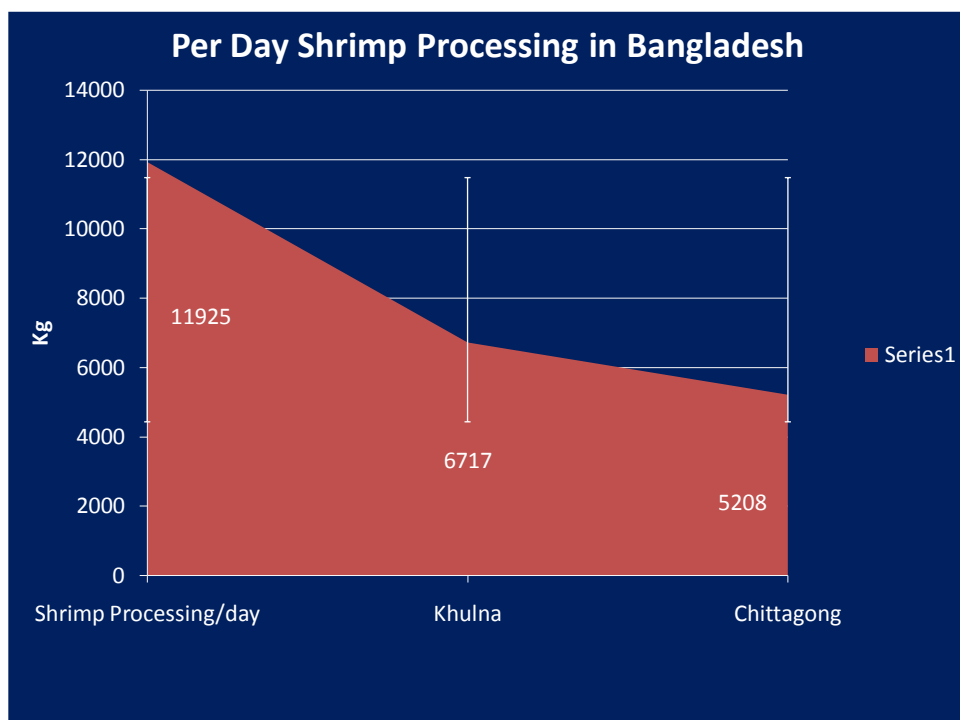
Raw Materials to By-products, CTG

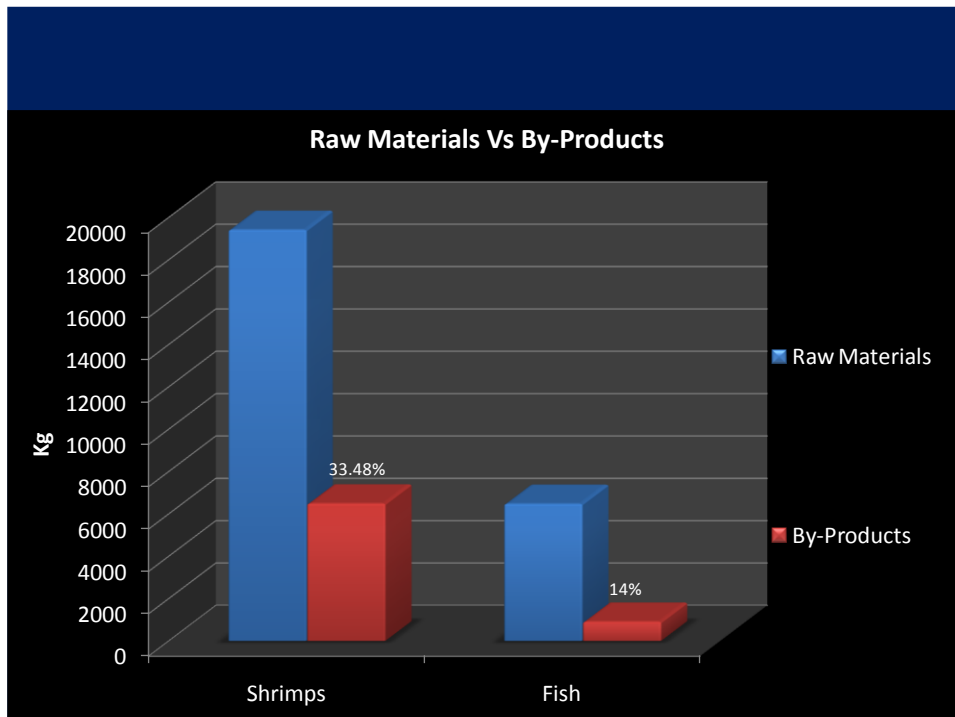




Findings: specific to shrimp processing

- ❑ Average Shrimp processing/day/factory: 6717 kg in Khulna of which, 93% Ready to Cook and 7% Ready to Eat products
- ❑ 5208 kg/day/factory in Chittagong of which, 86% Ready to Cook and 13% Ready to Eat products
- ❑ 34% or 4053 kg/day by-products produced in Khulna region
- ❑ 33% or 2437 kg/day by-products produced in Chittagong region
- ❑ Average production of by-products /day from 41 PP in Khulna is 166 MT
- ❑ Average production of by-products/day from 32 PP in Chittagong is 78 MT





What constitutes the raw material from the sector?

Fish raw materials constitute

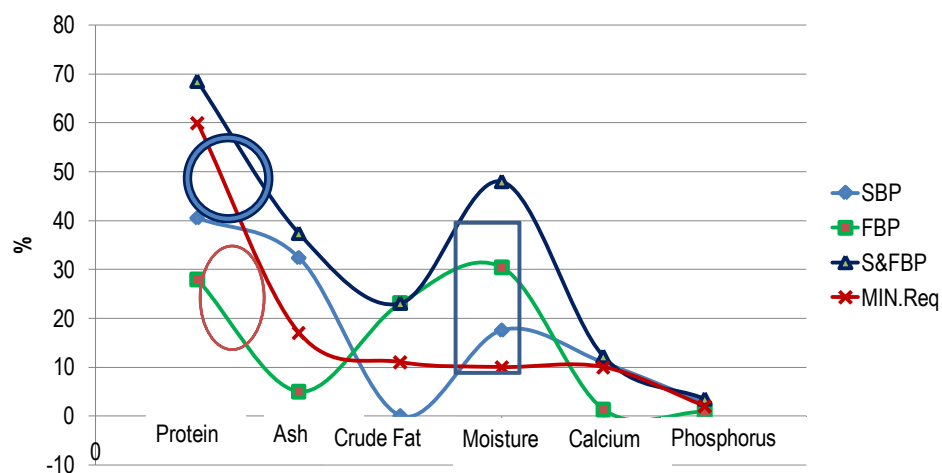
- Skin/Viscera/Scale/fins, liver, etc. contains 57 % of total by-products,
- Head contains 28 %
- Roe contains 15 % respectively

Shrimp raw materials constitute

- Shrimp head parts contain 90%
- Shells & legs part contains 10 %



Composition of Fish Meal with Min. Requirement of Quality Fish Meal



How does the supply of raw material and offal fluctuate over time

- Raw shrimps/fish comes to the processing plant from fragmented supply chain from long way by insulated van/box, etc. one/two day before processing
- After receiving keep the raw fish/shrimp into chill room, temperature is 5°C
- Processing room temperature is 20°C
- Raw materials temperature into basket/chill room is 5°C
- After processing by-products store at basket without ice for 3-4 hours at room temperature
- By-products store at garbage store up-to 8 hours where temperature is 30°C



Details on the quality of offal in the sector found in the lab tests carried to know the quality and presence of contaminants, if there is any

- Heavy metals of tested samples were under Maximum Limit
- Three derivatives of Nitrofurans antibiotic were under MRPL (1.00 ppb) except
- Semicarbazide (SEM) was positive into four shrimp samples out of 18 samples in Khulna region because by-products collected from Fresh Water Prawn
- Results showed that the Chloramphenicol was negative

How is the wastes/ raw materials currently handled

- Fish/shrimp processors treat the raw materials as wastes
- Eager to discard quickly without investing any cost
- According to FIQC Regulations, wastes should not store into processing areas, store outside the processing factory and discarded as earliest as possible.
- Raw materials being collected by plastic basket without putting ice. Together with packing wastes, paper, etc.
- Sometime keep into floor of garbage store
- Carry the by-products within 18-20 KM radius by human driven try cycle/ Van putting into plastic drum/covered by plastic sheet Without Ice



Present Attitudes of Processors

- Owners are reluctant to maintain quality of byproducts because of low price, no demand, no value, no space at factory, FIQC regulations, lack of technical knowhow on byproducts
- Presently byproducts sale to local entrepreneur/cat fish farms with TK 2 & tk. 1.33/ kg in KLN & CTG
- Few years ago: shrimp head and shell sold to china after drying, crashing and making powder by local entrepreneurs
- China stopped to buy from Bangladesh because Vietnam is near to china for having the byproducts easily cheaply.
- If the processors get good price like Tk 10-12/kg of byproducts, they are willing to maintain quality as food graded products
- To maintain quality, it involves money for space, ice, manpower, logistics, etc.

Some Insights into Fish Feed production

- ❑ According to the present practice of Masud Fish, 4/5 kg by-products is required to produce 1 kg fish meal
- ❑ Presently only 73 PP producing 278 MT by-products/day
- ❑ 62 MT Fish Meal/day can be produced by this amount of by- products
- ❑ Fish Oil (no information available)
- ❑ Cost would be 53 lakhs/day (Fish Meal @ Tk 85/kg); of 8MT fish meal is 6.8 Lakh/day, 158 Crore/year



Major Challenges standing in the way of utilization of Offal

- ☐ Problem in ensuring steady supply of by-products stands in the way of reaping the benefit from economies of scale needed for cost reduction and profitability
- ☐ Maintaining quality involves high cost
- ☐ Technical Expertise is lacking
- ☐ Mentality or mind set needs to be changed
- ☐ At the moment , 4 processing plants are in the pipeline which will be generating and in a position to significantly utilize offal for commercial purposes. They need to be encouraged.
- ☐ Bangladesh will also have to explore the possibility of utilizing offal generated in the non-informal market segments where major part of the country's offal is generated

Suggested Recommendations from the study

- ☐ Public Private Partnership Initiative to popularize use of offal for commercial purposes should be encouraged
- ☐ Introduction of needed Technology and technical know how through industry associations and government collaboration will be helpful
- ☐ Further in-depth research on quality control, low cost production and business feasibility should be undertaken

Details of the above findings may be seen in the enclosed report on the findings on the 5 (Five) research questions (RQs) at **Annexure-A**.



As part of the same component of the ATC-P project, a 5 (five) day workshop was conducted on the theme “***Quality Management and Value Addition in Fish and Shrimp Processing in Bangladesh***” from **May 08-12, 2016** at Chittagong, Bangladesh. Ms. Mary Frances Davidson (UNU-FTP) and Dr. Gudmundur Stefansson (Matis) from the UN University–Fisheries Training Program (UNU-FTP), Iceland participated in the workshop as resource persons in pursuance of the MoU of cooperation between BSFF and UNU-FTP. The workshop was attended by participants from Department of Fisheries, academia, the industry and BSFF. The program of the workshop and the list of participants are enclosed at **Annexure-B**.

During the workshop, rich interactive learning exercises on the following broad topics:

- Lessons learned, the example of Iceland
- Food not waste mentality
- Processing and value addition in Bangladesh
- Value chains and value addition
- Economic opportunities (making the most of what is available)
- Markets: foreign and domestic – buyers’ requirements
- International food laws and regulations
- Fish meal, oil, silage and other opportunities for Bangladesh
- Fish spoilage – indicators of quality / spoilage
- Fish and shellfish handling in Bangladesh

It was an important first occasion in Bangladesh when the possibility of using offal for commercial purposes was discussed in the presence of all the stakeholders in Chittagong. The workshop also provided the opportunity to discuss threadbare the various concrete interventions and incentives which would be needed to fully exploit the potentials of commercial utilization of offal in Bangladesh.

The Chittagong workshop was preceded by a high-level policy dialogue on May 07, 2016 on the possibility of creating scope for and production of value added products in the fisheries sector. Dr. Hossain Zillur Rahman, Advisor to the former Caretaker Government attended the policy dialogue as the Chief Guest while it was chaired by Syed Arif Azad, Director General,



DOF and moderated by Syed Mahmudul Huq, Chairman, BSFF. It was participated, among others, by French Ambassador to Bangladesh H.E. Ms. Sophie Aubert, former Director General of Asian Development Bank and Executive Director BRAC Institute of Governance and Development Dr. Sultan Hafeez Rahman, Eminent Economist Prof. Dr. Mohammad Ali Taslim, former Health Secretary to the Government of Bangladesh Mr. AKM Zafar Ullah Khan, former Agriculture Secretary Mr. CQK Mustaq Ahemd, Additional Secretary of Ministry of Fisheries and Livestock Mr. Anisur Rahman, Senior Vice President of Bangladesh Frozen Foods Exporters' Association Mr. Md. Golam Mostafa, SwissContact Katalyst's Head of Sectors Mr. GB Banjara, UN FAO Food Safety's International Food Analysis Expert Dr. Sridhar Dharmapuri, former trade adviser of Delegation to the European Union to Bangladesh Mr. Zillur Hye Razi and representatives from DOF, UN FAO, WorldFish, Katalyst, DFID. In this well attended policy dialogue, the above high officials of the relevant sectoral Ministries, representatives of Department of Fisheries, industry and economists discussed about the prospects of promoting production and marketing of value added products in the fisheries sector and increasing the diversity of products from the sector including the products produced using offal. The dialogue enabled participants to share their ideas on how progress in this regard can be made in Bangladesh. Ms. Mary Frances Davidson (UNU-FTP) and Dr. Gudmundur Stefansson (Matis) from the UN University–Fisheries Training Program (UNU-FTP), Iceland was also participated in the discussions on the occasion. A press release on the policy dialogue shared with the media by BSFF is enclosed at **Annexure-C**.



Annexure-A

The Findings on the study on opportunities related to Fish Wastes in Bangladesh

Conducted by Mr. Syed Istiak
BSFF consultant under ATC-P Project

Research Questions (RQs)

RQ.1. Where does the raw material originate and its amount?

There are three places in Bangladesh to process fish/shrimp for export, of which two are major region like Khulna and Chittagong. About 95% processing plants are located in these regions. Thirty-two fish/shrimp processing plants are in under operation in Chittagong region and about 41 in Khulna region. Altogether 78 Fish processing plants are in under operation either process for export (packers) or process for non-packers (3rd part involving in white fish export to Bangladeshi community abroad). Survey reveals that about 2000 kg fish being processed by a factory per day in Khulna region, of which 1500 kg are Fish slice/block/steak, etc and 500 kg are whole frozen/degutted/de-scaled, etc. In Chittagong region survey showed that about 3566 kg fishes being processed per day per processing plant, of which 1056 kg are Fish slice/block/steak, etc and 2510 kg are whole frozen/degutted/de-scaled, etc. About 400 kg by-products (raw materials) being produced every day from a processing plant in Khulna region, of which Skin/Viscera/Scale/fins, liver are 352 kg and head is 48 kg. In Chittagong region about 509 kg of which Skin/Viscera/Scale/fins, liver are 292 kg, head is 143 kg and roe is 76 kg respectively. Chittagong region is producing 21% more fish by products everyday than Khulna region.

Survey tells that about 6717 kg Shrimp being processed by a factory per day in Khulna region, of which 6230 kg are in raw frozen (whole, head on, head less, tail on, butterfly, PUD, P&D, etc.) and 487 kg are cooked (shell off), etc. In Chittagong region survey reveals that about 5208 kg Shrimp being processed by a factory per day in Khulna region, of which 4462 kg are in raw frozen (whole, head on, head less, tail on, butterfly, PUD, P&D, etc.) and 746 kg are cooked (shell off), etc. About 4053 kg by-products (raw materials) being produced every day from a processing plant in Khulna region, of which head parts is 3824 kg and shells, legs are 230 kg. In Chittagong region about 2437 kg of which 2061 kg is head parts and shell, legs are 375 kg respectively. Khulna region is producing 40 % more shrimp by products everyday than Chittagong region.

Study showed that about 12033 kg raw shrimps landed every day in every factory of Khulna region of which 10383 kg from aquaculture sources and 1650 kg from wild/captured sources. Simultaneously, in Chittagong region about 7383 kg raw shrimps landed every day in every factory only from aquaculture sources. Study showed that common shrimps being landed from



aquaculture are Black Tiger (*Penaeus monodon*), Fresh water prawn (*Giant Fresh Water Prawn*), Brown/Grey shrimp (*Metapenaeus monoceros*), White prawn (*Penaeus indicus*), etc and from Wild/captured are Ocean Tiger (*Penaeus monodon*), Brown/Grey shrimp (*Metapenaeus monoceros*), White prawn (*Penaeus indicus*), Flower Tiger, Cat tiger, Red shrimps, etc. Apart from this, study reveals that about 2400 kg raw fishes landed every day in every factory of Khulna only from wild/captured sources. Simultaneously, in Chittagong region about 4259 kg raw fishes landed every day in every factory of which 1680 kg from aquaculture and 2579 kg from wild/captured sources.

RQ.2. How the raw materials are currently handled?

Fish/shrimp processing factories are considering the raw materials as wastes that need to discard immediately without investing any cost. According to Fish Inspection and Quality Control Regulations, wastes should not store into processing areas, store outside the processing factory and discarded as earliest as possible. Survey showed that almost 100% cases raw materials being collected by plastic basket without putting ice. Sometime other garbage from floor (packing waste, paper) also keeps the same basket. Carrying it to waste store/garbage store and store it at 29°C temperature (ambient temperature of room) for 1 hour in Khulna and 7 hours in Chittagong region. Survey reveals that the raw materials being transport to 18-20 KM radius by human driven try cycle (called here in Van) putting into plastic drum/covered by plastic sheet Without Ice.

RQ.3. What constitutes the raw material?

Fish raw materials constitute skin, viscera/gut, scales, fins, roe, head, etc. Study reveals that skin/Viscera/Scale/fins, liver, etc. contains 57 % of total by-products, head contains 28 % and Roe contains 15 % respectively in Chittagong region. And in Khulna region skin/Viscera/Scale/fins, liver, roe, etc. 88% and head contains 12 % of total fish by products. On the other hand, in Khulna region Shrimp head parts contain 94% and shells & legs part contains 6 % and in Chittagong region heads parts contain 85% and shell & legs part contains 15% respectively.

Proximate test results of byproducts of Chittagong region showed that the fish by products contains 30.44% moisture, 27.96 % protein, 23.08 % crude fat, 4.97 % ash, 1.29 % calcium and 0.80 % phosphorus and shrimps by products of Chittagong region contains 14.25% moisture, 37.98 % protein, 34.84 % ash, 11.70 % calcium and 3.32 % phosphorus. Simultaneously, shrimps byproducts of Khulna region contains 20.85% moisture, 43.13 % protein, 29.98 % ash, 10.08 % calcium and 2.02 % phosphorus. Chittagong region mainly processing Black tiger and Khulna region processing Black tiger and fresh water prawn. During sampling period, Khulna region processed fresh water prawn and Chittagong region processed Black Tiger as well.



RQ.4. How does the supply of raw material and offal fluctuate over time?

I don't understand the actual meaning of this question. If I understood here raw materials is raw shrimp and fish and offal is byproducts then the answer is:

Usually raw shrimps/fish comes to the processing plant from fragmented supply chain from long way by insulated van/box, etc one/two day before processing. Processors keep the raw fish/shrimp into chill room mixing with flake ice. Survey showed that the processing room temperature is usually 20°C, raw materials temperature into basket/chill room is 5°C and during processing temperature is 10-13°C. After processing the raw materials store at basket without ice for 3-4 hours at room temperature before transport it to garbage store. This time is very notable to get spoil the offal before store because sometime room temperature gone up 20°C if small amount of raw materials being processed.

RQ.5. Conduct the lab tests for knowing its quality and contaminants, if there any

Conducted test into accredited lab of Fish Inspection and Quality Control of Khulna and Chittagong and PSTU, Chittagong and collected the following samples to conduct 18 tests per fish/shrimp processing plant on the following manner

Distribution of samples and collecting procedure

	Processing Plant-1	Sample A	Sample-B	Sample-C	Total Samples
1	Nitrofurantoin and its derivative	4	4	4	
2	Chloramphenicol	1	1	1	
3	Heavy Metal	0	0	0	
	a) Cadmium	1	1	1	
	b) Lead	1	1	1	
	c) Chromium	1	1	1	
4	Proximate Tests	0	0	0	
	a) Protein	1	1	1	



	b) Ash	1	1	1	
	c) Calcium	1	1	1	
	d) Phosphorus	1	1	1	
	e) Moisture	1	1	1	
	f) Crude Fat	1	1	1	
5	Microbial Tests, Normal Temperature	0	0	0	
	a) SPC	1	1	1	
	b) Total Coli	1	1	1	
6	Microbial Tests, below 5 Degree temperature (Control)	0	0	0	
	c) SPC	1	1	1	
	d) Total Coli	1	1	1	
	Total	18	18	18	=56

Two sets of Microbiological tests were done in every targeted fish/shrimp processing plant. One (Normal) was for 30°C temperature (normal garbage store temperature) and another (Control) was for 5°C below temperature (putting ice immediately after dressing/de-heading/processing). Three unbiased samples were collected from different parts of total byproducts from a fish/shrimp processing plant. Tests of Fish and Shrimp byproducts were separately done for every parameter. Results showed that the Aerobic Plate Count (cfu/g) were 15.45×10^5 and Total Coli. (MPN/g) were 551 at 5°C below temperature of shrimp by-products of Khulna region, Aerobic Plate Count (cfu/g) were 30.11×10^5 and Total Coli. (MPN/g) were 230 at 5°C below temperature of shrimp by-products of Chittagong region. Results showed that the Aerobic Plate Count (cfu/g) were 255.00×10^5 and Total Coli. (MPN/g) were 220 at 30°C temperature of shrimp by-products of Khulna region, Aerobic Plate Count (cfu/g) were 40.30×10^5 and Total Coli. (MPN/g) were 430 at 30°C temperature of shrimp by-products of Chittagong region, regarding microbiological test of fish by products, results showed that the Aerobic Plate Count (cfu/g) were 23.60×10^5 and Total Coli. (MPN/g) were 92 at 5°C below temperature of Fish by-products of Chittagong region and Aerobic Plate Count (cfu/g) were 272.50×10^5 and Total Coli. (MPN/g) were 150 at 30°C temperature of Fish by-products of same region.



Test results reveal that, the heavy metals of tested samples were under Maximum Limit (mentioned into the attached excel sheet). Three derivatives of Nitrofurans antibiotic were under MRPL (1.00 ppb) except Semicarbazide (SEM) was positive into four shrimp samples of 18 samples in Khulna region because Khulna region in that time processed Fresh Water Prawn. Results showed that the Chloramphenicol was negative in every sample of fish and shrimp. Proximate results showed into RQ 3.

RQ.6. Know the business incentive of industry on producing of fish meal

Survey reveals that every processing plant owners/managers are reluctant to maintain the quality of byproducts because of low price, no demand, no value, no space at factory, FIQC regulations and lack of technical knowhow of importance of byproducts. According to the finding of survey presently processors are selling their byproducts to nearest local entrepreneur/cat fish farms with TK 2 per kg in Khulna region and 1.33 per kg in Chittagong region. Few years ago, most of the shrimp head and shell were sold to china after drying, crashing and making powder by local entrepreneurs. China stopped to buying from Bangladesh because Vietnam is near to china for having the byproducts easily cheaply. That's why business to china is reducing. Study showed that if the processors get good price like Tk 18-20 per kg by selling byproducts, they are willing to maintain quality of by products as food graded products. They told that to maintain quality, it involves money to spare space, arrange ice, manpower, logistics, etc.

On the other hand, fish feed manufacturers are interested to buy fish meal made by byproducts, but supply should be steady and should contains 60% protein. Presently one kg fish meal (contain 60% protein) price is TK 85.

To make one kg fish meal, requires four/five kg byproducts. Survey showed that the byproducts (shrimp and fish) contain only 36% protein.



Annexure-B

Workshop Schedule, Topics and Participants

Inaugural Ceremony of the 5 Day Training Workshop

Date: **Sunday, May 08, 2016** Venue: **Marine Fisheries Academy, Chittagong**

Time	Event
09:30 am	Arrival of Guests and Registration
10:00 am	Opening remarks by Syed Mahmudul Huq , Chairman, Bangladesh Shrimp and Fish Foundation
10:05 am	Presentation on the collaboration between UNU-FTP and BSFF by Ms. Mary Frances Davidson , Project Manager, UNU-FTP, Iceland
10:15 am	Key note speech by Syed Arif Azad , Director General, Department of Fisheries on the importance of fisheries and fish farming
10:20 am	Sharing of experience of Bangladeshi trainers at UNU-FTP
	- Mr. Murad Mufti
	- Mr. Depak Kumar Paul
	- Mr. Suman Barua
10:30 am	Main findings from Istiak's research by Mr. SM Istiak
10:35 am	An outline of the 5 day training workshop by Dr. Gudmundur Stefansson
10:40 am	Remarks by Principal, Bangladesh Marine Fisheries Academy Captain Masuq Hassan Ahmed
10:45 am	Remarks by Coordinator, Business Promotion Council Mr. Fakir Feroz Ahmed
10:50 am	Remarks by Vice Chairman, Export Promotion Bureau Ms. Mafruha Sultana
10:55 am	Remarks by the Chief Guest
11:05 am	Concluding remarks by the Chair Syed Mahmudul Huq , Chairman, Bangladesh Shrimp and Fish Foundation
11:10 am	End of the program and Lunch

Course Schedule

Sunday
8 May

Time	Event
09:00	Participants Arrival and Registration
09:30	Participant introductions
10:00	Guests Arrive
10:30	Opening remarks by Syed Mahmudul Huq , Chairman, Bangladesh Shrimp and Fish Foundation
10:35	Presentation on the collaboration between UNU-FTP and BSFF by Ms. Mary Frances Davidson , Project Manager, UNU-FTP, Iceland
11:00	Key note speech by Nasir Uddin Md Humayun , Director , Department of Marine on the importance of fisheries and fish farming in Bangladesh
11:30	Sharing of experience of Bangladeshi trainers at UNU-FTP
	- Mr. Murad Mufti
	- Mr. Depak Kumar Paul
	- Mr. Suman Barua



11:45	Main findings from research on Opportunities related to fish wastes in Bangladesh by Syed Istiak, Principle Investigator, UNU-FTP & BSFF collaboration
11:55	An outline of the 5 day training workshop by Dr. Gudmundur Stefansson
12:00	Remarks by Principal, Bangladesh Marine Fisheries Academy Captain Masuq Hassan Ahmed
12:05	Remarks by Coordinator, Business Promotion Council Mr. Fakir Feroz Ahmed
12:10	Remarks by Vice Chairman, Export Promotion Bureau Ms. Mafruha Sultana
12:15	Remarks by the Chief Guest
12:20	Concluding remarks by the Chair Syed Mahmudul Huq , Chairman, Bangladesh Shrimp and Fish Foundation
12:25	End of the program and Lunch
13:30	Lessons learned, the example of Iceland GS
14:30	Main findings from Istiak's research's in detail
15:30	Processing and Value Addition in Bangladesh: Rafiqul Islam/Kador Ahmed
Monday 9 May	
09:00	Fish spoilage - indicators of quality/spoilage, GS
10:00	Fish and shellfish handling in Bangladesh, Abdur Rashed/Shajahan Ali
11:00	Chilling and fresh fish/shellfish preservation, GS
12:00	Break for lunch
13:00	Upstream control, MM
14:00	Good hygiene practice, GS
15:00	Group Discussion 1 :SI
Tuesday 10 May	
09:00	Processing - salting, drying and smoking, GS
10:00	"Food not waste" mentality, GS
11:00	Visit to processing plant: SI/RI
13:00	Break for lunch
14:00	Discussion
Wednesday 11 May	
09:00	Value Chains and value addition, MF
10:00	Economic opportunities (making the most of what is available), GS
11:00	Markets: foreign and domestic - buyers requirements, GS
12:00	Break for lunch
13:00	International food laws and regulations, GS
14:00	Fish meal, oil, silage, and other opportunities for Bangladesh, GS/SI
15:00	Group Discussion 2 (SI)
Thursday 12 May	
08:30	Workshop: summarizing what was done and seen this week, MF/SI



09:30	Presentations and wrap up
11:00	Evaluation
11:45	Closing ceremony and course conclusion
13:00	Lunch and end of training

Observers and Trainers

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List of Participants for Offal Management Training

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Annexure-C

Press Release

Proper utilization of fish and shrimp wastes likely to bring in fortune to Bangladesh fishery

Dhaka, May 8, 2016: The domestic fish production in Bangladesh has been steadily growing during the recent years with significant impact on GDP growth and ability of Bangladesh to meet the nutritional needs of her hundred and fifty million plus population. The country is however yet to start reaping the benefits from economically utilizing the fish wastes for producing an important range of by products which can be produced using fish wastes as raw materials. The prospects in this regard are formidable with the country presently annually generating almost a million tons of fish wastes which are hardly used systematically for further possible processing. Bangladesh can and should seriously start working to better utilize her fish wastes which may help her earn several million taka of additional income from the sector. This was the point specially highlighted by the specialists and experts attending a policy dialogue in the city recently.

The policy dialogue on “Creating value for waste: How to Reduce and Utilize Fish/Shrimp Wastes” was organized by Bangladesh Shrimp and Fish Foundation (BSFF) in collaboration with Department of Fisheries (DOF), UN University–Fisheries Training Program (UNU-FTP)/ Matis, Iceland, Bangladesh Marine Fisheries Academy and Bangladesh Frozen Foods Exporters’ Association under Agri-business Trade Competitiveness Project (ATC-P) of Business Promotion Council, Ministry of Commerce supported by SwissContact.



Picture shows Senior Project Manager of UNU-FTP, Iceland Ms. Mary Frances Davidson (1st left), Advisor to the former Caretaker Government Dr. Hossain Zillur Rahman (2nd left), Director General of Department of Fisheries Syed Arif Azad (3rd left), Chairman of Bangladesh Shrimp and Fish Foundation Syed Mahmudul Huq (4th left), French Ambassador to Bangladesh H.E. Ms. Sophie Aubert (4th right), former Director General of Asian Development Bank and Executive Director BRAC Institute of Governance and Development Dr. Sultan Hafeez Rahman (3rd right), former Health Secretary to the Government of Bangladesh Mr. AKM Zafar Ullah Khan (2nd right) and Research Group Leader of Matis, Iceland Dr. Stefansson Gudmundur (1st right)

The dialogue was organized by BSFF as a part of a pilot project under a Memorandum of Understanding signed between UNU-FTP and BSFF. The pilot project is aimed to explore the possibilities of utilizing fish and shrimp wastes initially for using as raw materials for fish meal and fish oil in Bangladesh. The project is being implemented by BSFF under Agri-business Trade Competitiveness Project (ATC-P) of Business Promotion Council, Ministry of Commerce supported by SwissContact. BSFF already conducted a quantitative survey of fish and shrimp wastes available in Bangladesh processing plants



and a qualitative survey to ascertain different elements in the wastes including protein and contaminants, if any, for possible utilization for production of different fishery by-products.

Dr. Hossain Zillur Rahman, Advisor to the former Caretaker Government attended the dialogue as the Chief Guest and it was chaired by Syed Arif Azad, Director General, DOF and moderated by Syed Mahmudul Huq, Chairman, BSFF. It was participated by French Ambassador to Bangladesh H.E. Ms. Sophie Aubert, former Director General of Asian Development Bank and Executive Director BRAC Institute of Governance and Development Dr. Sultan Hafeez Rahman, Eminent Economist Prof. Dr. Mohammad Ali Taslim, Additional Secretary of Ministry of Fisheries and Livestock Mr. Anisur Rahman, Senior Vice President of Bangladesh Frozen Foods Exporters' Association Mr. Md. Golam Mostafa, SwissContact Katalyst's Head of Sectors Mr. GB Banjara, UN FAO Food Safety's International Food Analysis Expert Dr. Sridhar Dharmapuri, former Health Secretary to the Government of Bangladesh Mr. AKM Zafar Ullah Khan, former Agriculture Secretary Mr. CQK Mustaq Ahemd, former trade adviser of Delegation to the European Union to Bangladesh Mr. Zillur Hye Razi and representatives from DOF, UN FAO, WorldFish, Katalyst, DFID.

The speakers at the dialogue told that instead of discarding the heads, frames, skin, scales, fins, liver, viscera, tails, guts, shells, legs etc. of fish and shrimp as wastes, these should be handled as food grades for use as raw materials for different by-products like fish meal, fish oil, pet feed, cytosine, chitosan or chitin etc.

The Chairman, BSFF in his opening remarks mentioned that they have taken the initiative to launch a campaign to create value for the shrimp and fish wastes in order to harness its potential to create job and generate additional income for the stakeholders in the value chain.

Dr. Hossain Zillur Rahman congratulated BSFF for taking this timely initiative in collaboration with DOF and industry stakeholders with technical support from UNU-FTP. He told that the biggest challenge is the mentality or mindset and efforts should continue to create awareness among all that there is a value in the wastes that can bring in benefits not only to the stakeholders involved; but also, the country at large.

Additional Secretary of Ministry of Fisheries and Livestock Mr. Anisur Rahman and Director General of Department of Fisheries Syed Arif Azad assured their fullest support to this initiative.

Earlier, Ms. Mary Frances Davidson, Senior Project Manager, UNU-FTP, Iceland briefed the dialogue about the ongoing collaboration between UNU-FTP and BSFF and Dr. Stefansson Gudmundur, Research Group Leader, Matis, Iceland gave a brief outline of the 5 day Train the Trainers program on offal management being held in Chittagong with participation from DOF, BFEFA, Marine Fisheries Academy, BSFF and Universities of Dhaka, Chittagong, Jagannath and Chittagong Veterinary and Animal Science University.