Final Report

Common services/activities, Technological Intervention and Environmental Interventions required for Dry Fish Processing

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EXECUTIVE SUMMARY

The present study was conducted to assess the existing dried fish processing practices and value chains of dried fishery products in Cox's Bazar, Patuakhali, Barguna and Kishorganj regions of Bangladesh for identifying existing constraints including both revenue and non-revenue generating activities and exploring environment-friendly technologies for branding strategies to access in premium market. The existing methods of producing dried fish and the value chains of dried fishery products such as freshwater and marine dry fish, organic dry fish, semi-fermented chepa were assessed in Cox's Bazar, Patuakhali, Barguna and Kishorganj of Bangladesh to (i) identify constraints such as both revenue and non-revenue generating activities, (ii) determine eco-friendly technologies for branding strategies to access in the premium market for the microenterprise (iii) assess the role of value chain actors and their existing problem in this sector (iv) to assess existing value chain constraints and (v) suggest certification and branding of dry fish product through traceability, eco-labelling and cluster management in each value chain. Team-visits were made in four study areas to collect data on six value chains. Four study areas were (i) Cox's Bazar (ii) Patuakhali (iii) Barguna and (iv) Kishoreganj. Questionnaire based interviews of different stakeholders (fishermen, commission agents-fresh fish, dry fish processor, commission agents-dry fish, aratders and retailers) were conducted using the field-tested questionnaires. Dried fish value chain actors were selected randomly and interviewed using a semi-structured questionnaire including focus group discussion.

Marine fish are processed in Cox's Bazar, Patuakhali and Barguna and freshwater fish in Kishorgonj. Total six value chains viz. (i) Fishermen, (ii) Foria/ aratdar/Commission agent (Fresh fish); iii. Dry fish processor; iv. Commission agent (Dry fish); v. Aratdar; vi. (Retailer/ Vendor) were found. Among them, all value chains were found in Cox's Bazar. Value chains five and six were absent in Barguna and value chain five in Patuakhali. In the first value chain (VC01), fishermen are the key actors. Among four regions, lack of ice causes quality deterioration of 83% raw fish in Barguna and Patuakhali, 90% in Cox's Bazar and 87% in Kishorganj. Overall, quality deterioration of 86% raw fish occurred due to lack of ice. Plastic crater (22 %) and plastic drum (29 %) are mostly used transport materials among the four regions. Among four regions, loan is required for about 83% of fishermen in Barguna and Patuakhali, 80% in Cox's Bazar and 53% in Kishorganj. Overall, loan is required for about 74% of fishermen in VC01. Overall, about 43% of fishermen reported lack of transportation facility as the main constraint. Among four regions, transportation and road facility is very poor in Barguna (100%) and Patuakhali (67%). ***In summary, fish cold storage, ice factory, insulated ice box, and training on fish preservation technique are required in VC01***. In the second value chain (VC02), the key actor is commission agent of fresh fish. In VC02, commission agent uses 82% open plastic and bamboo basket to transport fish without ice. As a result, quality deterioration of 75% raw fish occurred due to lack of ice prior to selling the fish to dried fish processor. Among four regions, lack of ice causes quality deterioration of 90% raw fish in Barguna and Patuakhali, 50% in Cox's Bazar and 69% in Kishorganj. About 66% of dried fish processor buy fish from commission agent. This indicates that dried fish processor gets low quality fish from commission agent. Consequently, VC02 is susceptible chain which has a great constraint to produce quality dried fish. In addition, the actor of VC02 gets 75% simple rate of return and 24 % market margin among the actors of six value chains. Therefore, the involvement of fresh fish commission agents (VC02) can be reduced from the marketing chain so that the dried fish producers (VC03) get more benefit buying raw fish directly from fishermen. About 16% of commission agent require loan to run their business smoothly. ***In brief, ice, fish cold storage, loan and training on fish preservation technique are required in VC02***.

In the third value chain (VC03), dried fish processors are the key actors who have play very important role to produce good quality dried fish. Poa (9.1%), Loittya (11%), churi (15%), puti (5.5%), boiragi (5.5%), faissa (5.5%) and chingri (9%) were the mostly dried fish among the four regions. About 87% of raw fish is dried unhygienically (use open bamboo floor or macha), while 13% of fish are dried hygienically (mechanical dryer). Basudin, DDT and Endrin (80%) are mostly used chemicals to produce unsafe dried fish. Overall, about 69% of dry fish processor use ice to produce dried fish products. Overall, about 73% of dry fish processor use brine to produce dried fish products. Overall, salt and turmeric are used by about 49 and 9% of dry fish processor to produce dried fish products, respectively. Dry fish processor mostly uses polypropylene bag (47%) and jute bag (31%) to store dried fish. Dried 8 fish product is mostly deteriorated owing to moisture uptake (42%) and rainy weather (27%). Guinna and loda (63%) and flies (27%) mostly infest dried fish products. Technological interventions such as mechanical dryer (31%), ring tunnel (43%) and good packaging system (26%) are required to produce safe dried fish. Dry fish processor disposes 71% of waste into river and sea during drying and thus pollute the environment. About 38% dry fish processor require loan. Among four regions, higher percentage of loan require in Patuakhali, followed by Kishorganj and Cox's Bazar. About 35% of dried fish processors have trade license. If dried fish processors maintain community ownership, community partnership and cluster management, it will be easier for them to get certification or licence. Use of all sorts of insecticide/pesticide during dry fish production, warehousing and trading should be prohibited. Toxic chemicals such as formalin, Basudin, DDT and Endrin etc. should be traced in dried fish products on regular basis by Fish inspection and quality control department of Department of Fisheries or Bangladesh Council of Scientific & Industrial Research (BCSIR). ***In summary, dried fish processors require healthy waste disposal system; mechanical, ring tunnel and solar powered fish dryer for producing hygienic and safe dried fish; fish silage production system from fish by-products; and advance dried-fish packaging system to avoid moisture uptake and insect infestation in VC03***.

In the fourth value chain (VC04), commission agent (dry fish) is the key actor. About 74% of dry fish commission agent did not get any training on how to handle and preserve dried fish hygienically. About 79% of dry fish commission agent requires loans while 21% requires washroom. Overall, commission agent mostly uses polypropylene bag (79%) and jute bag (21%). ***In summary, commission agent (dry fish) requires loan, advance dried-fish packaging system and training on preservation of dried fish hygienically in VC04***. In the fifth value chain (VC05) the key actor was aratder of dried fish. Among the study areas, dried fish aratders only found in Chittagong district. They collect fish from dry fish processor from Cox's Bazar and sell them to small dry fish trader/retailer. They offer 20-30% lower price to dry fish processor due to damage dry fish. Most of the dry fish aratder takes around 20% commission from dry fish commission agent. Some aratder takes 25% commission from dry fish commission agent. ***In summary, infrastructural particularly storage facilities at market need to be strengthened.*** In the sixth value chain (VC06), the key actor is retailer or vendor. About 39 % of retailers and fish vendors require loan for expanding their business. Retailer requires about 18, 80 and 25% of loans in Kishorganj, Patuakhali and Cox's Bazar district for expanding their business, respectively. About 58% of dried fish product is affected by insect infestation. Protection from insect infestation (33%) and proper sun drying (46%) are required to produce safe dried fish in four regions. Polypropylene (34%) and jute bag (30%) are mostly used to store dried fish by retailer. About 67% of unsold dried fish are sold to fish or poultry feed company. Retailer throw all the wastes into river (9%), dustbin (49%) and sea (42%) and pollute the environment***. In summary, retailer requires loan, healthy waste disposal system and training on preservation of dried fish hygienically in VC06***. The simple rate of return gives a quick, easy, and usually reasonably accurate

assessment of whether a particular investment would likely be worth it in the long run. Simple rate of return was 65% in VC02, followed by 39% in VC03, 28% in VC04, 74% in VC05 (only present in Cox's Bazar) and 21% in VC06. Simple rate of return is 54% in Cox's Bazar, followed by 49% in Patuakhali, 30% in Kishorganj and 24% in Barguna (VC05 and VC06 are absent). Marketing margin is a way of figuring profitability. A high marketing margin of dried fishes was 48% for Gonia, 44% for Tular dandi, 41% for Chepa, 38% for Gozar, 34% for Loittya, 30% for Poa and 33% for Bashpata. Higher marketing margin was 38% in Patuakhali, followed by 33% in Barguna, 25% in Kishorganj and 23% in Cox's Bazar. High marketing margin was 57% in VC03, followed by 24% in VC02, 23% in VC06, 22% in VC04 (only present in Cox's Bazar) and 4% in VC05. In VC02, higher market margin found in Chingri (13%), Poa (9.4%), Loittya (9.4%), and Churi (9.4%). Higher market margin found in Churi (15%), Poa (9.1%), Loittya (10.9%), and Chingri (9.1%) in VC03. In VC04, higher market margin found in Faissa (11%), Poa (8.3%), Loittya (8.3%) and Chingri (8.3%). In contrast, higher market margin found in Churi (7%), Churi (7%), Loittya (7%) and Faissa (7%) in VC06. A high marketing margin reflects a high level of profitability. Some dry fish processors in Cox's Bazar used eco-labelling for organic dry fish packaging. Ecolabelling was not found in the remaining three regions. Some eco-labelled dried fish products processed and packaged by different companies were found in super shops such as Agora, Swapno and Meena bazar in Dhaka city. For the production of safe dry fish, technological interventions are required in four regions. Safe dry fish production technology is not available in Kishorganj, Barguna and Patuakhali. Only few mechanical and solar fish dryers are used in Cox's Bazar to produce safe dry fish. To get certification and branding of the safe dried fish product for accessing in premium market, technological and environmental interventions, traceability, cluster management, microfinancing and ecolabelling are the prior prerequisites