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REPORT ON

A COMPREHENSIVE REVIEW OF THE CURRENT STATUS OF FARMERS' KNOWLEDGE & PERCEPTION ON THE USE OF AQUA INPUTS AS WELL AS TRADERS' COMPLIANCE WITH ON CURRENT RULES, REGULATIONS AND GUIDELINES ON AQUA INPUTS AT THE LOCAL LEVEL

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WorldFish

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Study conducted by

Bangladesh Shrimp and Fish Foundation (BSFF)

Supported by

Feed the Future Bangladesh Aquaculture and Nutrition Activity

Submitted by

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Implemented by

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In collaboration with

Department of Fisheries (DoF), Bangladesh

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Study period

October 2019 – January 2020

ACRONYMS

AHCAB	Animal Health Companies Association of Bangladesh
BAPCA	Bangladesh Aqua Product Companies Association
BBS	Bangladesh Bureau of Statistics
BSFF	Bangladesh Shrimp and Fish Foundation
CVM	Center for Veterinary Medicine
DoF	Department of Fisheries
DLS	Department of Livestock Services
FGD	Focused Group Discussion
FtF BANA	Feed the Future Bangladesh Aquaculture and Nutrition Activity
FDA	Food and Drug Administration
FTA	Fisheries Training Academy DoF
GDP	Gross Domestic Products
KII	Key Informant's Interview
NGO	Non-Governmental Organization
NOC	No Objection Certificate
RCM	Regional Consultation Meeting

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Executive Summary

The recent Bangladesh development experience has been remarkable in many ways with important implication for the countries over all growth trends, poverty eradication and significant sectoral transformation of the national economy. There has been major growth gains in the fisheries and aquaculture sector during the last four decades which definitely contributed to the development of Bangladesh. The aquaculture sector in particular experienced major growth and this has happened as a consequence of introduction of modern production methods and increasing use of feed and aqua inputs by the countries fish farmers. A comprehensive study was under taken as part of the project "Work on policy consolidation and improvement in licensing, management process and effective use of aqua inputs." implemented by Bangladesh Shrimp and Fish Foundation (BSFF) with support from WorldFish and Feed the Future Bangladesh Aquaculture and Nutrition Activity to collect primary information and data from six geographical divisions of Bangladesh on how the sample farmers in these areas are using aqua inputs with other relevant issues on the same subject. The study also was so designed to collect information on aqua inputs marketing from dealers in the project area. A key objective of the study was also to collect information on the ground reality on compliance with rules and regulations in the sector. The findings of the study are reflected in the present report.

Information collected from 4,576 sample farmers and 245 sample dealers indicate that most sample farmers extensively use aqua inputs other than feed for multiple purposes and the use of aqua inputs increases with the incremental intensification of the production process. This is true, according to the information collected from the field, both for fin fish and shrimp. Most sample farmers have to supplement their own resources with loans and credits from variety of sources to pay for the aqua inputs used by them. The sample farmers interviewed for the purpose of the study also shared how they came to know about the aqua inputs to be used and their perception about benefits from the use there of. They are on the whole positive about the outcome of the use of aqua inputs. Most of the sample farmers aren't aware of any rules and regulations about the desired use of and types of permissible aqua inputs.

Information collected from local level dealers on such issues as ground reality on testing, storage facilities used by them, their mode of information sharing with farmers, knowledge about rules and regulations and payment mode used by them to sell their products. The most important information obtained from the dealers/ retailers and sellers the latter are not obliged in any way

to submit the list of products marketed by them to the DoF officials, they are barely aware of rules and regulations governing the sector and most of them do not have good storage facilities. All these findings have important policy implications for future enforcement purposes. The dealers and sellers, though they impart some training for appropriate use of aqua inputs marketed by them, can do much more to meet demand from the actual users of aqua inputs.

Both the sample farmers and dealers interviewed during the study work were of the view that they will continue to use and sell aqua inputs as the case may be and particularly sample dealers noted that they are expecting the markets for aqua inputs in Bangladesh increasing further in the future. Both sample farmers and the dealers are not averse to the idea of implantations of rules and regulations which will help the sector. However the sample dealers were of the view that no rules or regulations should be enacted or implemented which stands in the way of hassle free introduction and marketing of their products. The sample farmers, on their part, called for relevant rules and regulations for the introduction and marketing of quality aqua inputs, a system of testing of such aqua inputs, prohibition/destruction of harmful aqua inputs, need for more training and making dealers/sellers more responsive to farmers' demands for detailed information on products being marketed and their application and permissible doses.

Introduction

The Bangladesh Shrimp and Fish Foundation (BSFF) has been implementing the project entitled 'Work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' with support from Feed the Future Bangladesh Aquaculture and Nutrition Activity.As part of the project three important activities have been carried out so far involving 1) A review of the relevant Acts, Rules, Regulations and Guidelines in Bangladesh governing the fisheries and aquaculture sector with special reference to their coverage of aqua inputs, 2) the preparation of an inventory of aqua inputs other than feed being used by the fish farmers in the country and 3) a stock taking of the select testing facilities to assess their present capacity to carry out testing of aqua inputs. To supplement the findings from these main components of the project, a comprehensive study has also been conducted on the present status of a) farmers' knowledge & perception on the use of aqua inputs, b) traders' compliance with current rules, regulations and guidelines on aqua inputs at local level. The study was carried out over a period of four months from October 2019 to January 2020. The present report highlights the main findings obtained in course of the study based on extensive field level questionnaires-based survey and collection of data from the main fish producing regions in Bangladesh.

Objectives of the study

During the recent years there has been a remarkable growth in the fisheries and aquaculture sector in Bangladesh. This growth has enabled the fisheries and aquaculture sector to contribute significantly to the country's GDP, employment generation, poverty eradication and meeting the nutritional needs of the growing population of Bangladesh. The growth in the sector has been accompanied in many cases by transformative changes in the production methods used by the farmers, increasing use of feed and particularly importantly the use of aqua inputs other than feed. A main purpose of the present study has been to collect detailed information on different aspects of use of aqua inputs from actual farmers and the dealers who market these aqua inputs. Such information, it was felt, would be helpful to supplement the information independently collected on the use of aqua inputs separately undertaken under the present project while an inventory of the same was prepared. The study has also been planned to gather information from actual users of aqua inputs on how they assess the usefulness of aqua inputs and their future plans about using such inputs. At the same time, the study approach has been so designed as to facilitate collection of information of types of farmers using aqua inputs, their source of funds and similar other relevant farmers specific information which may be of interest for policy makers. Collection of detailed information on the marketing aspects, dissemination on knowledge on use of aqua inputs, training on their appropriate uses and state of awareness about rules and regulations and compliance with those was also an important objective of the present exercise.

Methodology followed during the study

The methodology followed during the present study has been a combination of preparatory desktop research on recent trends in the development of the fisheries and aquaculture sector in Bangladesh with special focus on the types of fish species produced, their relative shares in the country's overall fish production, the types of production methods being used by Bangladeshi fish farmers, regional concentration of production of particular fish species, the evolving pattern of use of inputs of various types used by the farmers in aquaculture as well as a field level comprehensive survey conducted for the purpose. The desktop research preparatory to the study was carried out from 01 October to 15 October 2019.

A comprehensive exercise was carried out, as agreed with the Feed the Future Bangladesh Aquaculture and Nutrition Activity Team during the project formulation phase, to determine the sample population for the survey. Fish production data for Bangladesh by districts are available in DoF publication (Fisheries Statistical Year Book). Appropriate sampling techniques were followed to determine sample size, distribution and selection of samples. Divisions, districts and upazillas in Bangladesh known as fish producing hubs/areas were chosen for conducting the study. Samples were drawn in consultation with Divisional Deputy Director (DD), District Fisheries Official (DFO) and Upazilla Fisheries Officials (UFO) from 6 administrative divisions of Bangladesh (Dhaka, Barishal, Khulna, Rajshahi, Mymensingh and Chattogram) and 11 districts therein (Faridpur, Mymensingh, Barishal, Bagerhat, Khulna, Satkhira, Jashore, Rajshahi, Natore, Cox's Bazar and Cumilla). As agreed with the WorldFish team approximately 95% of the samples were farmers and 5% were traders. A total number of samples of 4,821 were drawn comprising 4,576 fish farmers and 245 aqua inputs dealers.

The allocation of samples for the study by geographic divisions of Bangladesh has been as follows:

Table 1: Allocation of sample by Division

Division	No of district	No of sample upazillas	No of sample aqua farmers			No of traders (dealer/retailer)	Total Samples
			Carp farmer	Shrimp farmer	total		
Dhaka	1	3	162	-	162	9	171
Mymensingh	1	5	806	-	806	44	850
Barishal	1	3	233	-	233	12	245
Khulna	4	16	1746	793	2539	134	2673
Rajshahi	2	6	271	-	271	15	286

Division	No of district	No of sample upazillas	No of sample aqua farmers			No of traders (dealer/retailer)	Total Samples
			Carp farmer	Shrimp farmer	total		
Chattogram	2	6	505	60	565	31	596
Total	**11**	**39**	**3,723**	**853**	**4,576**	**245**	**4,821**

The details of district and Upazilla wise samples used for the study have been the following

Table-2: Samples used for comprehensive study of farmer's perception on the use of aqua inputs

Sl. No.	District	Upazila	Upazilla wise Samples (nos.)	Carp Farmer (#)	Shrimp Farmer (#)	Total Farmer / users	Dealer/ Retailers
01	Faridpur	Faridpur Sadar	55	52	0	**52**	**3**
		Modhukhali	69	63	0	**66**	**3**
		Boyalmari	52	49	0	**49**	**3**
02	Mymensingh	Mymensingh Sadar	281	263	0	**263**	**18**
		Trishal	72	68	0	**72**	**4**
		Fulbaria	222	211	0	**211**	**11**
		Muktagacha	214	203	0	**203**	**11**
03	Barishal	BarishalSadar	89	85	0	**85**	**4**
		Gournodi	78	74	0	**74**	**4**
		Uzirpur	89	85	0	**85**	**4**
04	Bagerhat	Bagerhat Sadar	111	52	53	**102**	**6**
		Fokrhat	120	57	57	**114**	**6**
		Mollahat	140	67	66	**140**	**7**
05	Khulna	Dumuria	350	167	166	**333**	**17**
		Batiaghata	39	19	18	**37**	**2**
		Dacope	50	24	24	**48**	**2**
		Paikgacha	10	10	0	**10**	**0**
	Satkhira	Tala	166	78	79	**157**	**9**
		Debhata	106	51	50	**101**	**5**
		Kaligonj	191	90	91	**181**	**10**
		Shyamnagar	229	107	110	**217**	**12**
07	Jashore	JashoreSadar	97	92	0	**97**	**5**
		Obhaynagar	489	465	0	**465**	**24**
		Jhikargacha	76	72	0	**72**	**4**
		Monirampur	326	310	0	**310**	**16**
		Keshobpur	168	81	79	**160**	**8**
08	Rajshahi	Paba	78	74	0	**74**	**4**

Sl. No.	District	Upazila	Upazilla wise Samples (nos.)	Carp Farmer (#)	Shrimp Farmer (#)	Total Farmer / users	Dealer/ Retailers
		Puthia	31	29	0	**29**	**2**
		Durgapur	38	36	0	**36**	**2**
		Baghmara	46	43	0	**43**	**3**
09	Natore	NatoreSadar	40	38	0	**38**	**2**
		Gurudaspur	54	51	0	**51**	**3**
10	Cox's Bazar	Cox's Bazar Sadar	91	60	26	**86**	**5**
		Chakaria	48	31	14	**45**	**3**
		Pekua	70	46	20	**66**	**4**
11	Cumilla	AdashaSadar	92	87	0	**87**	**5**
		Chandina	225	210	0	**210**	**10**
		Choddagram	77	72	0	**72**	**4**
Total			**4,821**	**3,723**	**853**	**4,576**	**245**

For the purpose of the survey two questionnaires were prepared- one for the farmers and another one for the dealers. They were field tested before the actual commencement of the survey work which was conducted between 16 October 2019 and 15 January 2020. The finalized questionnaires are at Annexe-1 and Annexe-2. The data collectors for the survey went through a two days (13-14 October, 2019) training workshop at Fisheries Training Academy, Savar, Dhaka prior to the actual commencement of the survey on 16 October 2019. The training program was facilitated by retired senior officials of BBS &DoF, FTA.

Fin fish farmer	2984
Shrimp farmer	778
Polyculture farmer	814
Total farmers	4576
Dealers/Retailers	245
Total sample	4821

The data collected and processed were cleaned up by the Data Management Expert working with BSFF for the project and entire project team analyzed the same for the preparation of the present report and its main findings.

Findings of the study

The field level survey helped the BSFF study team to collect a wealth of information on the ground level realities about use of aqua inputs other than feed in the fisheries and aquaculture sector of Bangladesh. The main findings in this regard are presented in the following section of the report.

Numbers and types of farmers using aqua inputs

A major findings of the present study has been that almost the quasi-totality all the respondent sample farmers interviewed use aqua inputs. According to the survey carried out and as is indicated in the table-3 below 98.8% of the interviewed sample farmers use aqua inputs other than feed.

Table-3: Number & types of farmers used aqua inputs

Types	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Use aqua inputs other than feed	2,936 (98.39%)	776 (99.74%)	810 (99.51%)	4,522 (98.82%)

The survey carried out for the present study indicates that use of aqua inputs other than feed has become a defining characteristics of the fish farming practices in Bangladesh with nearly 84.75% of the sample interviewed farmers practicing improved tradition and semi-intensive production method are using aqua inputs. As is seen in table-4 below even traditional farmers to some extent also use aqua inputs. About 15% of the sample traditional farmers interviewed during the survey also use aqua inputs. The use of aqua inputs were relatively higher for fin fish farmers (90.99%) compared to shrimp farmer (80.46%) when responses from the improved traditional/ semi intensive farmers were taken into account. The percentage was relatively lower (65.97%) for farmers practicing poly culture. Traditional shrimp farmers used relatively more aqua inputs (19.54%) compare to farmers producing fin fish using traditional methods.

Tbale-4: Information on the use of aqua inputs by types of farming

Types of farmers	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Improved traditional and Semi intensive	2,715 (90.99%)	626 (80.46%)	537(65.97%)	3,878(84.75%)
Traditional	258 (8.65%)	152 (19.54%)	276(33.91%)	686(14.99%)
Intensive	11 (0.37%)	0 (0.00%)	1(0.12%)	12(0.26%)

Years for which aqua inputs are being used

The present study findings indicate that the use of aqua inputs by farmers of all types has become a normal practice for most of the sample farmers for a considerable number of years. 39.42% of the sample farmers interviewed during the survey stated that they have been using aqua inputs for more than 8 years or above. As is seen in table-5 below almost 58% of the rest of the sample farmers interviewed during the survey have been using aqua inputs for a period between 2 to 7 years generally indicating that most of the farmers interviewed have been using aqua inputs for quite sometimes.

Table-5: Duration of use of aqua inputs by the respondent farmers

Years	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
1	80 (2.68%)	0 (0.00%)	4 (0.49%)	84 (1.84%)
2-3	604 (20.24%)	117 (15.04%)	60 (7.37%)	781(17.07%)
4-5	784 (26.27%)	231(29.69%)	125 (15.36%)	1,140 (24.91%)
6-7	433 (14.51%)	133 (17.10%)	201 (24.69%)	767 (16.76%)
8 and above	1,083 (36.29%)	297 (38.17%)	424 (52.09%)	1,804 (39.42%)

Educational status of aqua inputs users

Production practices of farmers using aqua inputs benefit from knowledge of users of such inputs and in that regards education is certainly an asset for the farmers. In the present study the respondent farmers were thus asked a specific question about their level of education. Interestingly 55% of them have education from secondary to higher secondary level or above. About 33% of rest of them have primary level of education and only 11% of them reportedly have only had non-formal education. The details in this regards in table-6 below.

Table-6: Educational status of farmers

Types of education	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Primary	944 (31.64%)	323 (41.52%)	256 (31.45%)	1,523 (33.28%)
Secondary	1,007 (33.75%)	231(29.69%)	274 (33.66%)	1,512 (33.04%)

Higher secondary and above	740 (24.80%)	114 (14.65%)	170 (20.88%)	1,024 (22.38%)
Non formal education	293 (9.82%)	110 (14.14%)	114 (14.00%)	517 (11.30%)

Source of fund of aqua inputs users

Most of the respondent farmers interviewed during the present survey use their own funds to procure aqua inputs used by them (57.08%). However, a substantial number of them use resources from a combination of multiple sources (42.18%). Details in this regard may be seen in table-7 below. Most significantly the farmers using resources exclusively from NGOs, Banks, Relatives, Money lenders, Aqua input sellers are very insignificant.

Table-7: Source of funds of farmers

Sources	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Own	1,957 (65.58%)	405 (52.06%)	250 (30.71%)	2,612 (57.08%)
NGOs	2 (0.07%)	4 (0.51%)	11(1.35%)	17 (0.37%)
Banks	5 (0.17%)	3 (0.39%)	5 (0.61%)	13 (0.28%)
Relatives	2 (0.07%)	0 (0.00%)	0 (0.00%)	2 (0.04%)
Money lenders	0 (0.00%)	1(0.13%)	0 (0.00%)	1(0.02%)
Aqua input sellers	1(0.03%)	0 (0.00%)	0 (0.00%)	1(0.02%)
Multiple Sources*	1,017(34.08%)	365 (46.92%)	548 (67.32%)	1,930 (42.18%)

***Multiple sources: Own, NGO's, Banks, Relatives, Money lenders, Aqua input sellers**

Knowledge about use of aqua inputs

Table-8 below sums up the finding of the present study on the knowledge of sample farmers on the appropriate use of aqua inputs. Almost 72% of the farmers interviewed stated that they are aware of how the aqua inputs need to be used. Sample fin fish farmers were found to be relatively more knowledgeable than sample shrimp farmers and farmers practicing poly culture. Interestingly enough 27.71% of the sample farmers stated that they are not aware of appropriate application of aqua inputs. Training on appropriate knowledge on use of aqua inputs are required.

Table-8: Farmers Knowledge about use of aqua inputs

State of knowledge	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Knows about use/applications	2,411 (80.80%)	491 (63.11%)	406 (49.88%)	3,308 (72.29%)
Does not know about appropriate application	573 (19.20%)	287 (36.89%)	408 (50.12%)	1,268 (27.71%)

Mode of dissemination knowledge about aqua inputs

The interviewed sample farmers covered under the present study (59.44%) stated that they were helped in getting information on various aspects of use of aqua inputs from DFOs and SUFOs. However it is evident, as is seen from table-9 below, they also acknowledge having being informed about aqua inputs and their usages by details in brochure provider by companies / dealers (24.02%) and practical trainings provided by them (22.49%).

Table-9: Mode of knowledge dissemination on aqua inputs

Status of knowledge dissemination	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
DFOs/SUFOs helped	1,900 (63.67%)	476 (61.18%)	344 (42.26%)	2,720 (59.44%)
Company/Dealers help with brochures	817 (27.38%)	129 (16.58%)	153 (18.80%)	1,099 (24.02%)
Company/Dealers help with training	715 (23.96%)	178 (22.88%)	136 (16.71%)	1,029 (22.49%)

Purposes for which aqua inputs are used

The members of the BSFF study team carrying out the survey at the field level found it extremely difficult to elicit information from the sample farmers interviewed for specific/single purposes for which they use aqua inputs. Most of them stated that they use aqua inputs for multiple purposes (97.74%). This is uniformly the case for fin fish and shrimp farmers as well as farmers practicing poly culture. The details in this regard can be seen in table-10 below.

Table-10: Purpose of use of aqua inputs

Purpose of use	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Pond water and soil preparation	47 (1.60%)	4 (0.52%)	3 (0.37%)	54 (1.19%)
Disease treatment	33 (1.12%)	1 (0.13%)	0	34 (0.75%)
Predator fish control	5 (0.17%)	1 (0.13%)	1 (0.12%)	7 (0.15%)
As insecticides	1 (0.03%)	5 (0.64%)	1 (0.12%)	7 (0.15%)

Growth enhancer	0	0	0	0
Multiple purposes*	2,850 (97.07%)	765 (98.58%)	805 (99.38%)	4,420 (97.74%)

*Multiple purposes: Pond water and soil preparation, Disease treatment, Predator fish control, As insecticides, Growth enhancer.

Control of aquatic insect in aquaculture by insecticides

Around 26.01% of the farmers interviewed during the study stated that they use insecticides to control the aquatic insects i.e. aurgulosis and unwanted crustaceans (Cyclops) in the nursery pond.

Table-11: Control of aquatic insect in aquaculture by insecticides

Use of insecticides	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Does not use	2,120 (71.05%)	654 (84.06%)	612 (75.18%)	3,386 (73.99%)
Does Use	864 (28.95%)	124 (15.94%)	202 (24.82%)	1,190 (26.01%)

Aqua inputs use encouraged by

It appears from the survey carried out in connection with the present study that farmers use of aqua inputs has been facilitated, encouraged and promoted by multiple modes of information dissemination, promotional activities and information gathered by sample farmers themselves from other farmers in the locality and district and Upazilla level fisheries officials. The key findings of the study in this regard can be seen in table 12 below.

Table-12: Use of aqua inputs encouraged by

Person/Entities inspiring aqua inputs use	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Other farmers in locality	456 (15.53%)	56 (7.22%)	53 (6.54%)	565 (12.49%)
Local DFO/SUFO	313 (10.66%)	114 (14.69%)	103 (12.72%)	530 (11.72%)
At own initiative	235 (8.00%)	20 (2.58%)	18 (2.22%)	273 (6.04%)
Aqua inputs dealers/sellers	143 (4.87%)	21(2.71%)	157 (19.38%)	321 (7.10%)
Company representatives	35 (1.19%)	3 (0.39%)	1 (0.12%)	39 (0.86%)
NGOs	22 (0.75%)	0	2 (0.25%)	24 (0.53%)
Advertisement	0	0	0	0
Multiple sources*	1,732 (58.99%)	562 (72.42%)	476 (58.77%)	2,770 (61.26%)

***Multiple sources: Other farmers in locality, Local DFO/SUFO, Own initiative, Aqua inputs dealers/sellers, Company representatives, NGO's, Advertisements.**

Modality for payment of aqua inputs

For all the respondent sample farmers payment for aqua inputs is a major area of concern. They are in most cases obliged to buy their aqua inputs on cash payment basis (63.62%). A certain number of them (29.81%) purchase aqua inputs in a cash cum credit payment arrangement. Unlike as the interviewed dealers stated very few of them noted that they can procure their aqua inputs on credit. Here there is a significant difference in the responses of the sample farmers and dealers interviewed.

Table-13: Purchase modality of aqua inputs

Purchase modality	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Local dealers/retailers through cash	2058 (70.10%)	582 (75.00%)	237 (29.26%)	2877 (63.62%)
Local dealers/retailers through credit	37 (1.26%)	2 (0.26%)	39 (4.81%)	78 (1.72%)
Company representative through cash	80 (2.72%)	0 (0.00%)	0 (0.00%)	80 (1.77%)
Company representative through credit	16 (0.54%)	7 (0.90%)	23 (2.84%)	46 (1.02%)
Local dealers/retailers through cash & credit	679 (23.13%)	172 (22.16%)	497 (61.36%)	1348 (29.81%)
Local dealers/retailers through credit & Company representative through cash	1 (0.03%)	0	0	1 (0.02%)
Local dealers/retailers through cash & Company representative through cash	54 (1.84%)	11 (1.42%)	12 (1.48%)	77 (1.70%)
Local dealers/retailers through cash & Company representative through credit	1 (0.03%)	2 (0.26%)	1 (0.12%)	4 (0.09%)
Local dealers/retailers through credit & Company	1 (0.03%)	0	1 (0.12%)	2 (0.04%)

representative through credit				
Company representative through cash & credit	9 (0.31%)	0		9 (0.20%)

Farmer's perception on impact of use of aqua inputs

On the whole, the sample farmers interviewed noted that they have been helped in their production processes by the use of aqua inputs (97.68%) of them were of this view. Only an insignificant number of sample farmers (2.32%) didn't share this view. Details can be seen in table 14.

Table-14: Information on impact of use of aqua inputs as shared by respondents

Result	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Use of aqua inputs helpful	2,877 (97.99%)	750 (96.65%)	790 (97.53%)	4,417 (97.68%)
Use of aqua inputs not helpful	59 (2.01%)	26 (3.35%)	20 (2.47%)	105 (2.32%)

Farmer's perception shared on level of satisfaction

As regards their level of satisfaction about use of aqua inputs, the sample farmers interviewed noted that their use of aqua inputs has been helpful and consequentially they are satisfied about the use of aqua inputs. An overwhelming majority was of this view (93.48%) as opposed to an insignificant number of them (6.52%) differing with that view. The percentage of farmers in this last category was higher for farmers practicing poly culture.

Table-15: Information on level of satisfaction as shared by respondents

Level of satisfaction	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Satisfied	2,824 (96.19%)	715 (92.14%)	688 (84.94%)	4,227 (93.48%)
Not satisfied	112 (96.19%)	61 (7.86%)	122 (15.06%)	295 (6.52%)

Information on trend of sales of aqua inputs being marketed by dealers

As part of the present study 245 dealers were asked questions about different aspects of their marketing of aqua inputs. One of the questions asked in this regards was with regards to of the trend in use of aqua inputs in Bangladesh. Almost all of the sample dealers (76.73%) noted

that their market for aqua inputs has been increasing all over Bangladesh. Only an insignificant number of them (23.27%) respondent that their market was not experiencing any increase.

Table 16: Information on trend of sale of aqua input being marketed as shared by dealers

Trend of sale	No of dealers (% of total)
Increasing	188 (76.73%)
Not increasing	57 (23.27%)

Information on types of farmers using aqua inputs as shared by dealers

According to information obtained from the sample dealers the improved extensive and semi intensive farmers are the most numerous group of farmers (78.78%) using aqua inputs. Traditional farmers (6.94%) also use aqua inputs but not as numerous as the improved extensive and semi intensive farmers. The details in this regards can be seen in table-17.

Table-17: Information on types of farmers using aqua inputs as shared by dealers

Types of farmers	No. of dealers (% of total)
Semi intensive	193 (78.78%)
Improved traditional	22 (8.98%)
Traditional	17 (6.94%)
Intensive	13 (5.30%)

Dealer's knowledge on rules and regulations regarding the aqua inputs' trade

This is one area where the information collected by the BSFF study team are quite disappointing. A majority of dealers (61.22%) have no knowledge about relevant fisheries and aquaculture rules and regulations. The same disappointing picture emerges with regard to knowledge about Fish Feed and Animal Feed Act 2010 and Fish Hatchery Act 2010. Table-18 below has the relevant factual position in this regard.

Table-18: Dealers' Knowledge of rules & regulations

Knowledge about rules & regulations	No of dealers (% of total)
Have knowledge about Rules & Regulations	95 (38.78%)
Have no knowledge about Rules & Regulations	150 (61.22%)
Have knowledge about Feed Act 2010	87 (35.51%)
Have no knowledge about Feed Act 2010	158 (64.49%)
Have knowledge about Hatchery Act 2010	72 (29.39%)
Have no knowledge about Hatchery Act 2010	173 (70.61%)

Information on the status of license being needed

Most dealers (45.31%) stated during their interactions with BSFF survey team that they needed any type of licenses for selling aqua inputs indicating that no effective monitoring in this regard. Half of the sample dealers (54.96%) noted that they obtain licenses from DoF and DLS.

Table-19: Information on status of license being needed

Source of license	No of dealers (% of total)
No license needed for selling aqua inputs	111 (45.31%)
DoF (Feed Rules-2011)	91 (37.14%)
DLS (Feed Rules-2011)	43 (17.55%)
DGDA	0
BSTI	0

Status of submission of product information to DoF

This is another area where there still is scope for serious compliance requirement in future. Most aqua input dealers (67.76%) don't submit their product details to the competent local authorities except only an insignificant parentage of them (32.24%).

Table 20: Status of submission of product information to DoF

Status of submission of information	No of dealers (% of total)
Not submitted	166 (67.76%)
Submitted	79 (32.24%)

Ground reality on testing requirements shared by dealers/retailers

A similar disappointing picture emerges with regards to testing requirement for aqua inputs. For most of them (91.84%) told no such test were required.The picture obtained from sample dealers in this regard is presented in the table-21 below.

Table-21: Ground reality on testing requirements shared by dealers/retailers

Testing requirement	No. dealers (% of total)
Test not required from them	225 (91.84%)
Test required	20 (8.16%)

Ground reality on storage facilities of aqua inputs

For ensuring the quality of aqua input being marketed possession of good storage facilities by dealers/ retailers is an important pre condition. Unfortunately only small number of sample dealers (17.14%) had good storage facilities. As indicated in table 22 below most of them (82.86%) don't have such storage facilities.

Table-22: Ground reality on good storage facilities used by dealers/retailers

Status of storage facilities	No. of dealers/retailers (% of total)
Do not have good storage facilities	203 (82.86%)
Have good storage facilities	42 (17.14%)

Information on sales modalities shared by dealers

Sample dealers contacted for information during the survey carried for the present study (86.53%) stated that they mostly sold their products using a combination of cash sale on credit. Unlike the sample aqua input users covered during the survey, they did not so much volunteer to state that they insisted on cash sale mostly.

Table-23: Information on sales modalities shared by dealers

Modality of sale	No of dealers (% of total)
Sale on cash & credit	212 (86.53%)
Sale on cash	33 (13.47%)
Sale on credit	0 (0.00%)

Status of training given by dealers/retailers

In course of the survey carried by the BSFF study team the respondent sample dealers/retailers were requested to share information on whether they impart training on the appropriate application/use of aqua inputs sold by them. From the relevant information obtained in this regard, as is presented in table 24 below, it appears that 40.41% of them do so where as a significant 59.59% do not do so.

Table-24: Status of training given by dealers/retailers

Status of training given	No of dealers (% of total)
Do not give training	146 (59.59%)
Give training	99 (40.41%)

Nature of training provided by dealers/retailers

The nature of training provided by the dealers/retailers are always not of the same types. 64.65% of the sample dealers/ retailers reportedly gave training both on use of inputs and the general production of fish produced. However, 26.26% of the respondent sample dealers/retailers imparted training only on application of inputs an even lower 9.09% of the respondents gave training on actual production method covering all aspects of productions.

Table 25: Nature of training provided by dealers/retailers

Nature of training	No of dealers (% of total)
Application of inputs & Training on actual production	64 (64.65%)
Application of inputs	26 (26.26%)

Training on actual production	9 (9.09%)

Frequency of training given by dealers

As is seen from details in table -26 below the frequency in which the sample dealers and retailers impart trainings to the client fish farmers varied between a practice of training once a year and twice annually. More than half (50.51%) of the sample dealers/retailers reportedly gave training twice a year and training given once a year was reported by the rest (49.49%).

Table 26: Frequency of training given by dealers

Frequency of training	No of dealers (% of total)
Twice a year	50 (50.51%)
Once a year	49 (49.49%)

Dealers' expectations about future

The growing market opportunities opened up by the farmers' continued interest to use aqua inputs other than feed is a major incentive for the aqua input dealers and retailers in Bangladesh. This was also evident from the general information on dealers'/retailers' expectations about future marketing opportunities shared during the survey conducted by BSFF team. An overwhelming number of dealers and retailers interviewed (95.92%) during the survey expressed the hope that use of aqua inputs will continue to increase in future (table 27).

Table-27: Dealers' expectations about future use of aqua inputs

Expectation	No. of dealers (% of total)
Will increase	235 (95.92%)
Will remain unchanged	5 (2.04%)
Don't know	5 (2.04%)

Information on future plan on use of aqua inputs shared by respondent farmers

The fact that optimistic responses about good market prospects for aqua inputs received from sample dealers/retailers were based on their assessment about continued interest of target farmers to use aqua inputs was confirmed by relevant responses from sample farmers interviewed during the survey for the present study. As is seen from table-28 below most of the respondent sample farmers (99.23%) stated that they will continue to use aqua inputs in future.

Table-28: Information on future plan on use of aqua inputs shared by respondent farmers

Future plan	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
Will continue to use	913 (99.22%)	767 (98.84%)	807 (99.63%)	4,487 (99.23%)
Will not continue to use	23 (0.78%)	9 (1.16%)	3 (0.37%)	35 (0.77%)

Recommended steps for improvement as shared by sample farmers

The sample farmers interviewed during the survey as part of the present study were generally of the view that in the Bangladesh context only the useful, cost effective and non-harmful aqua inputs should be marketed in Bangladesh. They expect and hope that the government of Bangladesh and the concerned competent authorities should play their due role to achieve these broad objectives. As is seen in table-29 below they identified several steps that can be considered for the purpose. Support was expressed by farmers (99.85%) for the need of relevant government rules, enforcement of such rules (83.06% of the farmers supported this) and marketing of only government approved aqua inputs (78.88% of the farmers).

Table-29: Recommended steps for improvement as shared by sample farmers

Recommendation	No. of Fin fish farmers	No. of shrimp farmers	No. of Fin fish-shrimp polyculture	No. of farmers for all type
There should be Govt. Rules	2,931 (99.83%)	776 (100.00%)	808 (99.75%)	4,515 (99.85%)
Enforcement of Rules.	2,469 (84.09%)	596 (76.80%)	699 (86.30%)	3,756 (83.06%)
Application details should be on printed leaflet	2,585 (88.04%)	566 (72.94%)	800 (98.77%)	3,951 (87.37%)
Application details should be on package	2,837 (96.63%)	771 (99.36%)	803 (99.14%)	4,411 (97.55%)
Random field level testing	2,339 (79.67%)	604 (77.84%)	754 (93.09%)	3,697 (81.76%)
Destruction of harmful products.	1,847 (62.91%)	390 (50.26%)	743 (91.73%)	2,980 (65.90%)
Testing facilities should be there	1,985 (67.61%)	561 (72.29%)	739 (91.23%)	3,285 (72.64%)
Should be approved by the Government.	2,290 (78.00%)	547 (70.49%)	730 (90.12%)	3,567 (78.88%)
There should be training on aqua inputs use.	2,502 (85.22%)	747 (96.26%)	753 (92.96%)	4,002 (88.50%)

They (72.64% of the farmers) supported that there should be testing facilities to test the quality of aqua inputs being marketed as well as random testing (81.76% of the farmers supported this). If needed, the respondent farmers, are not averse to the drastic action like destruction of harmful aqua inputs being marketed in the country. More than half of the respondent farmers (65.90%) supported such punitive action. The respondent farmers are keen that application details should be printed on user friendly leaflets (87.37% of the farmers supported this) and large number of respondent farmers (97.55%) were of the view that application details should be printed on the packaging materials of the aqua inputs sold. More

than half of them (88.50%) acknowledged the value of training in appropriate use of aqua inputs for them and the need to make such trainings available.

Dealers' /Retailers' perception about rules and regulations

One of the interesting findings emerging from the survey carried out for the present study has been that the sample respondent farmers were mostly supportive of strengthening of the regulatory regime and the enforcement arrangements in the country to ensure the marketing of quality aqua inputs from the use of which they can derive benefits. When posed with questions on the same subjects the dealers and the retailers marketing such products (95.51%), as is seen in table-30 below noted that they are not against rules and regulations. However, in series of FGDs conducted in course of the work for the present study the private sector stakeholders, i.e. the dealers and retailers as well as representatives of their apex organizations noted that such rules and regulations should be transparent and enforced in a manner that would cause encumbrances in the way of hassle free approval and marketing of such products.

Table-30: Sample dealers' /retailers' perception about rules and regulations

Perception about need for new rules & regulations	No of dealers (% of total)
There is a need	234 (95.51%)
There is no need	11 (4.49%)

Additional inputs for inventory of marketed aqua inputs being used

As part of the project "Support for policy consolidation and improvement in licensing, management process and effective use of aqua inputs" a separate exercise was carried out to prepare an inventory of aqua inputs presently being marketed in Bangladesh. The comprehensive field level survey, the findings of which are reflected in the present report, was a useful opportunity to obtain further information on aqua inputs being used in the project area. The additional information on aqua inputs being marketed has been used to prepare and update inventory which can be seen at Appendix-1 of the present report.

The BSFF team working on the present survey came across a significant ground level reality which may have important policy level implications. It was thus found by the BSFF team that pesticides are widely used by the fish farmers in the study area for variety of purposes, mostly as agents for piscidies and insecticides. The list of brand names of such materials collected during the present survey may be seen at Appendix-2.

Conclusion:

The present study has been extremely timely and useful as its findings provide extensive details and information from the fields about the extent of use of aqua inputs other than feed in the aquaculture in Bangladesh. It appears that the use of aqua inputs has become a wide spread phenomenon with farmers increasingly using them with increasing intensification of their production processes. Such wide spread use of aqua inputs has important cost implications for the farmers and notwithstanding costs they are using them for gains in terms of increased production and minimal incidence of diseases during the production process. From the perspective of the farmers a due role played by the government will benefit them if only quality aqua inputs are introduced and marketed in the country. On the other hand from the consumers' perspective also the marketing and use of quality aqua inputs with no harmful consequences are important to ensure food safety. The present study thus highlights why there is a need for consolidating and improving the laws, rules, regulations and guidelines to adequately cover all aspects of introduction, marketing and use of aqua inputs. There were also useful insights obtained in course of the study about specific areas where the farmers in the study area considered significant future improvements can be made to address their legitimate concerns. For future policy, regulatory improvement and effective enforcements-these insights, it is hoped, will prove to be useful.

Annex-1
Survey questionnaire for farmers

Title: Comprehensive review of the present status of a) farmers' knowledge & perception on the use of aqua inputs, b) traders' compliance with current rules, regulations and guidelines on aqua inputs at local level.

General details:

Name of farmer:……

Address: Vill: Upazila: District:

Mobile No:…… **Age:**…….

Level of education: …….. **Farm area (acre):**……

Cultured species:……

……..

Production method: Traditional/Improved traditional/Semi-intensive/Intensive

Source of fund: own/loans from relatives/loans from money lenders/loans from banks/loans from NGOs/ loans & credit support from inputs suppliers

Details on inputs use:

1. Feed used: Yes/No
2. Source of feed: home-made/manufactured
3. Status of use of aqua inputs: yes/no
4. If yes then name of the products?
5. For how many years you are using aqua inputs?
6. If yes, what types of aqua inputs are used:
    a. 1.
    b. 2.

c. 3.
d. 4.
e. any others

7. Purpose for which aqua inputs are used:
   a. 1.
   b. 2.
   c. 3.
   d. 4.
   e. 5.
   f. 6.
   g. any others
8. Who encouraged you to start using aqua inputs:
   a. Other farmers using aqua inputs
   b. Dealers/retailers of aqua inputs
   c. Company representatives
   d. Development workers/NGO representatives
   e. DoF Officials
   f. Advertisement by electronic and print media
   g. No one encouraged, but took the initiative by self.
9. Are you satisfied by the outcome or result using aqua inputs: yes/no
10. Do you timely get supply of your required aqua inputs? Yes/no
11. Would you like to continue to use of aqua inputs? Yes/no
12. If you would like to continue using aqua inputs, why?
    a. Diseases prevention
    b. Growth enhancement
    c. Both
13. Are you aware about the product details and applications methods? Yes/no
14. Do the dealers/retailers/company representatives give you detailed brochures and other materials on product details and application methods? Yes/no
15. Do the dealers/retailers/company representatives provide or arrange any training on use of aqua inputs? Yes/no

16. Have you ever incurred loss or suffered as a result that aqua inputs sold were not useful or they were harmful: yes/no
17. In case the answer to the above question is yes, please mention the name of products or types of products:
18. Have you ever benefitted from DoF extension services on the appropriate use of aqua inputs use? Yes/no
19. Do you think that DoF extension officers should help you about the proper use of aqua inputs? Yes/no
20. How do you purchase aqua inputs?
    a. Local retailers/dealers on cash payment
    b. Local retailers/dealers on credit
    c. Company representatives on cash payment
    d. Company representatives on credit
21. Farmers perception on possible supportive actions to help them make better use of aqua inputs as well as increase production:
    1. There should be rules, regulations and guidelines for banning the marketing of harmful aqua inputs
    2. Suggestion and prescription from DoF extension officers
    3. Detailed information on product & application methods
    4. Ensuring quality of aqua inputs available in market
    5. Training on application in using aqua inputs
    6. One-stop information and service facilities for crisis management in case of emergencies
    7. Affordable price for all types of aqua inputs
    8. Stopping malpractices in marketing of aqua inputs through marketing of aqua inputs of questionable quality.
    22. Do you use any agricultural pesticides in Aquaculture? Yes/ No
    23. If yes please tell us the name of the pesticides
    24. If yes please indicate the purpose for which you used the pesticides

Annex-2
Survey questionnaire for dealers/retailers

Title: Comprehensive review of the present status of a) farmers' knowledge & perception on the use of aqua inputs, b) traders' compliance with current rules, regulations and guidelines on aqua inputs at local level.

General details:

Name of Dealer/Retailer:……...

Address: Vill: Upazila: District:

Mobile No:……. **Age:**……

Details on aqua inputs sold:

1. Types of inputs sold:

Sl. No.	Types of inputs	Brand Name	Name of marketing company	Active ingredients	Purpose of use
1					
2					
3					

Sl. No.	Types of inputs	Brand Name	Name of marketing company	Active ingredients	Purpose of use
4					
5					
6					
7					
8	Any other				

Sl. No.	Types of inputs	Brand Name	Name of marketing company	Active ingredients	Purpose of use
	types of inputs				

2. Who uses your inputs? traditional/improved traditional/semi-intensive/intensive farmers
3. In your opinion is the use of aqua inputs increasing? Yes/no
4. If yes, please mention about the approximate annual % increase during the last three years in your area:
5. How do you think about the future of aqua inputs use in Bangladesh?
   a. Will increase
   b. Will remain stagnant
   c. Any other observations.
6. Are you aware of any rules, regulations, guidelines on aqua inputs trading and use? Yes/no
7. If yes, mention details:
8. Do you think that there should be transparent rules and regulations? Yes/no
9. What types of permissions do you need for selling aqua inputs in your area?
10. Who gives you the permission?
11. Do you share the information about aqua inputs marketed with local DoF officials?
12. Types of information shared:
    a.
    b.
    c.
13. Do you have to go through any mandatory or random testing of your marketed products by competent govt. departments/authorities? Yes/no
14. Do you have proper storage facilities of aqua inputs? Yes/no
15. If yes, please mention briefly about your storage capacities:

a.

b.

c.

d.

16. Do you have policy about not marketing expired products? Yes/no.
17. Do you share relevant information on aqua inputs with farmers? Yes/no
18. Types of information shared with farmers:
    a.
    b.
    c.
    d.
    e.
    f.
19. Do you provide or arrange any training among the farmers regarding aqua inputs use? Yes/no
20. If yes, frequency and types of training?
    a.
    b.
    c.
    d.
    e.
21. Mode of aqua input sale:
    a. Cash payment
    b. On credit
    c. Part cash + part credit
22. Please share your assessment about the use of aqua inputs in your area:
    a. Good
    b. Not so good
    c. No responses
23. Do you know farmers use agricultural pesticides in fish culture? Yes/No

Annex-3
Photographs of the comprehensive study

Fig:01-Data collection at Mymensingh

Fig:02-Data collection at Natore

Fig:03-Data collection at Rajshahi

Fig:04-Data collection at Barishal

Appendix-1

Name of additional brands of aqua inputs collected during field survey conducted in connection with the comprehensive study

SL	Product Name	Company Name	Active Ingredients	Input Category	Purpose
1.	Pro Act	Piscina Gold	Probiotics	Biologics	4
2.	PC Jel	Piscina Gold	Protien, Vitamin	Biologics	4
3.	PC xyme	Piscina Gold	Probiotic, Enzyme	Biologics	4
4.	Bio spark	Piscina Gold	Bacillus spp. Nitrosomonas spp	Biologics	4
5.	Noxnil	Piscina Gold	Probiotic	Biologics	4
6.	Vatezain	Jamuna animals	Bacillus spp., Saccharomyces spp., Lactobacillus spp., Strreptococcus spp.	Biologics	1
7.	Super Germ Killer	Desh&Agro industries	Bacillus spp	Biologics	1
8.	Sinatin	Krishokbondhu group	Oak Extract	Biologics	2
9.	Bio guard	Sigma Agrovet	Bacillus spp	Biologics	4
10.	Gas kill	Sigma Agrovet	Sacroniumsp	Biologics	1
11.	Bottom Pro clean	Pritom	Bacillus spp, BiO2, Al2O	Biologics	1
12.	MH Aqua powder	Boon vaniteng. Ltd.	Bacillus spp., Saccharomyces spp., Lactobacillus spp., Strreptococcus spp.	Biologics	1
13.	Pond masie	Farmers Agri Business	Probiotics	Biologics	4
14.	Mizoplus	G 5	Bacillus spp	Biologics	1
15.	Pro 4000X	Aqua intechusa	Probiotics	Biologics	4
16.	Fish growth	Bismillah Corporation	Zn, Mg	Disinfectant	4
17.	Biosyn	Piscina Gold	BKC 80%	Disinfectant	1
18.	Savior	Piscina Gold	CaOH, NaOH, NaHCO3	Disinfectant	2
19.	Oxygen	Piscina Gold	Sodium per carbonate	Disinfectant	2
20.	Aqua Safe	GunimAgro Care ltd.	BKC 80%	Disinfectant	2
21.	pH Master	Noja aqua ltd	Sodium chloride, zinc sulphate, manganese sulkphate	Disinfectant	1
22.	China Aqua jet plus	China aqua care system	KMnO4	Disinfectant	1
23.	China aqua gold solution	China aqua care system	Sodium percarbonate, Per oxy hydrate 90%	Disinfectant	1
24.	Super control	Noho Aqua Chemical	Caffeine, Cobalt sulfate, Zinc Salfate, Manganese Sulfate, Sodium Chloride	Disinfectant	1
25.	Aqua jet super gold	S&S aqua product	Amino acid, Potassium permanganet	Disinfectant	1
26.	AquacleanDeotok	Fish world	Costic thiosulfate, Sodium salt	Disinfectant	1
27.	Chemist zeolite	Chemist group	SiO2, Al2O3, Fe2O3, CaO, MgO, Na2O, k2O, MnO2, P2O5	Disinfectant	1
28.	Aqua nourish	Aqua chemicals	Sodium per carbonate	Disinfectant	1
29.	Aqua lime	Aqua chemicals	Calcium Carbonate, Potassium menganet	Disinfectant	1
30.	Aqua solution	Aqua chemicals	Sodium chloride, Zinc Sulphate, Manganese Sulphate	Disinfectant	1
31.	Green zeolite	Green touch	SiO2, Al2O3, Fe2O3, CaO, MgO, Na2O, k2O, MnO2, P2O5	Disinfectant	1
32.	Germia	Galib group	Sodium thiosalphate, Ethylene di amine tetra acetic acid	Disinfectant	1

SL	Product Name	Company Name	Active Ingredients	Input Category	Purpose
33.	Eco fish	Desh&Agro industries	Potassium peroximonosalphate, Sodium Dichloroisosayanuret	Disinfectant	1
34.	Germokil	Desh&Agro industries	BKC 80%	Disinfectant	2
35.	Power killer	Aman group	BKC 80%	Disinfectant	2
36.	Bengal Aqua Solution	KDS AgroCemical Co.	Sodium chloride, Zinc Sulphate, Manganese Sulphate	Disinfectant	1
37.	Super care	Classic aqua	Cobult sulfate zinc	Disinfectant	1
38.	Pro oxy	Pritom	90% Sodium	Disinfectant	1
39.	Pre virocin plus	Pritom	Dry metheline blue	Disinfectant	1
40.	Antisafety aqua	Euro asiaagrobangladesh	BKC 80%	Disinfectant	1
41.	Lime tone	BAF company	BKC 80%	Disinfectant	1
42.	Caliphos	MAK Distribution	Potassiuym per oxymonosulphate	Disinfectant	1
43.	Bekosol Plus	JB Agro Healthcare	BKC 80%	Disinfectant	1
44.	Aqua cleaner world	Fish world	Costicthio sulphate	Disinfectant	1
45.	BKC	VnFAgro ltd.	BKC 80%	Disinfectant	1
46.	G Gard	G 5	Glutereldihide	Disinfectant	1
47.	N900	Magnify agro	BKC 80%	Disinfectant	1
48.	Oxy aua	Magnify agro	Sodium percarbonate	Disinfectant	1
49.	Meltro	Somts aqua products	Sodium, Potassium	Disinfectant	2
50.	Epicin	Epicone USA	EPICIN - D	Disinfectant	1
51.	Backtragold	RS Chemical	Ivermectic 3%, Excipients 97%	Drugs	4
52.	Mactis	Mac agro	Ivermactin	Drugs	3
53.	G Max 30	G 5	Moxacte	Drugs	3
54.	Mega mix	Magnify agro	Ciprofloxacine	Drugs	3
55.	Bengols	KVS	S-58%, M-Violet	Drugs	3
56.	Fish Cup Gold	Bismillah Corporation	Calcium, potacium	Others	1
57.	Protect	Piscina Gold	Beta glucon, Vitamin	Others	4
58.	Mazplank	Piscina Gold	Minerals, Humic Acid	Others	4
59.	Paradox	Piscina Gold	Probiotic, Vitamins, Minerals	Others	4
60.	V-Guard	Piscina Gold	Imuno booster	Others	4
61.	Liucca	Piscina Gold	Yucca schindegera	Others	1
62.	Gas clean	GunimAgro Care ltd.	Yucca schindegera	Others	1
63.	Fish Care	Sarderagro care	Vitamins, Minerals	Others	
64.	Pro yucca care	PVS laboratories	Yucca schindegera	Others	1
65.	Gold fish	Jamuna animals	Vitamins, minerals	Others	4
66.	Fast grow	Mac agro	Beta Glucan & Mannan Oligosaccharide etc.	Others	4
67.	Fish Amonil	Desh&Agro industries	Yucca scindigera	Others	1
68.	Germichek	Fatah group	Yucca scindigera	Others	1
69.	Aammo clean	Argon	Yucca schindigera	Others	1
70.	Aquavita premix	Argon	Vitamin & Minerals	Others	4
71.	Bio grow	Sigma Agrovet	Vitamin, Minerals	Others	4
72.	Asco,az WSP	JB Agro healthcare	Vitamin C	Others	4
73.	Enok Growth powder	EnokAgro	Vitamin	Others	4
74.	Gasonill	G 5	Yucca schindigera	Others	1
75.	G vita C	G 5	Vitamin C	Others	4
76.	Miracle G	G 5	Vitmain	Others	4
77.	Yucca pro	Magnify agro	Yucca schindigerra	Others	1
78.	Nutrivit	Magnify agro	Vitamin, minerals	Others	4
79.	Yucca liquid	Chaina biotechnologies	Yucca schindigerra	Others	1
80.	GBI	Fuji sargoCo.ltd	Vitamins, Minerals	Others	4

SL	Product Name	Company Name	Active Ingredients	Input Category	Purpose
81.	Fresh grow	Shams agrovet ltd.	Vitamins, Minerals	Others	4
82.	Grow at	Shams agrovet ltd.	Vitamins, Minerals	Others	4
83.	Paraquit	Piscina Gold	C48H74O14, C48H72O14	Pesticide	1
84.	Sifanon	Semko	Malthion	Pesticide	2
85.	Arthion	Rico Agrovet	Malthion	Pesticide	2
86.	Ripbird	Padma oil	Curbofuran	Pesticide	2
87.	Sumithion	Setu	Esfenvalerate, Fenitrothion	Pesticide	1
88.	Rotenone	Simco Group	Rotenone	Pesticide	5
89.	Vittoka	Singenta	Thiamethoxam, Chloranlraniliprole	Pesticide	1
90.	Generte	Genetica	Rotenone powder	Pesticide	5
91.	Trifuralin-44	Argent/USA	Trifluralin	Pesticide	1
92.	Robot	Catapol Bioscience Ltd.	SiO2, Al2O3, Fe2O3, CaO, MgO, Na2O	Disinfectant	1
93.	GoodEarth	Catapol Bioscience Ltd.	Alcaligenes sp Bacillus sp Nitrosomonas sp.	Biologics	1
94.	Gaskit- X	Catapol Bioscience Ltd.	Yucca Extract	Others	1
95.	Oxypol Tab	Catapol Bioscience Ltd.	Sodium percarbonate	Disinfectant	1
96.	Farmsafe	Catapol Bioscience Ltd.	Didecyl Dimethyl Ammonium Chloride (DDAC) Ethyl Alcohol	Disinfectant	2
97.	Aquabite S	Catapol Bioscience Ltd.	Hydrolysed Fish Protein	Others	4
98.	APVIT C Stable	Catapol Bioscience Ltd.	L-ascorbyl-2-monophosphate (Thermostable ascorbic acid 35%)	Others	4
99.	Magic power	Manikgonj			
100.	AR Power Argulis	Gazipur			

Purpose of use: 1- Pond soil and water management, 2-Disinfectant, 3-Diseases treatment, 4-Growth Enhancer and 5-Predator Control.

Appendix-2
List of Agricultural Pesticides used in Aquaculture

SL	Name of the Pesticides
1.	Sumithion
2.	Thiovit
3.	Thiodine
4.	Ripbird
5.	Casper
6.	Barud
7.	Vitako
8.	Iodine
9.	Acimax
10.	Rifkot
11.	Emamethrine
12.	Marshal
13.	Dithion
14.	Killer
15.	Sincyber
16.	Pascale
17.	Rich (Eon)
18.	Cutatop
19.	Power Killer
20.	Arguclean
21.	Benet
22.	Nito
23.	Lizard
24.	Angrave