



Report

on

The study carried out on sample Laboratories and Testing Facilities in Bangladesh in order to help facilitate their up-gradation and where necessary promote a consensus on a designated point for all testing and monitoring activities relating to aqua inputs.

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implemented by

Bangladesh Shrimp and Fish Foundation (BSFF)

supported by

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Report Prepared and Submitted by



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Acronyms

AEC	Atomic Energy Centre
AHCAB	Animal Health Companies Association of Bangladesh
BAPCA	Bangladesh Aquaculture Product Companies Association
BAU	Bangladesh Agricultural University
BCSIR	Bangladesh Council of Scientific and Industrial Research.
BFRI	Bangladesh Fisheries Research Institute
BLRI	Bangladesh Livestock Research Institute
BSFF	Bangladesh Shrimp and Fish Foundation
CVASU	Chattogram Veterinary and Animal Science University
DAE	Department of Agriculture Extension
DGDA	Directorate General of Drug Administration
DLS	Department of Livestock Services
DoF	Department of Fisheries
DU	Dhaka University
FF	Faculty of Fisheries
FGD	Focus Group Discussion
FMRTD	Fisheries and Marine Resource Technology Discipline
FtF BANA	Feed the Future Bangladesh Aquaculture and Nutrition Activity
GC	Gas Chromatography
GCMS	Gas Chromatography Mass Spectrometry
GCMSMS	Gas Chromatography Mass Spectrometry Mass Spectrometry
GNP	Gross National Product
HPLC	High Performance Liquid Chromatography
ICPMS	Inductively Coupled Plasma Mass Spectrometry
IFST	Institute of Food Science and Technology
LCMSMS	Liquid Chromatography Mass Spectrometry Mass Spectrometry
USAID	United State Agency for International Development

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Executive Summery

Adequate laboratory facilities in Bangladesh is a pre-requisite to ensure the quality and safety of aqua inputs increasingly being used in the country in the growing aquaculture sector. During the recent years the stakeholders in the sector have not only started using modern production methods but they have also started using more and more quality seed and feed. The use of aqua inputs other than feed now also has become quite prevalent raising valid concerns about adequacy of the country's laws, rules, regulations and guidelines to ensure their safe and proper use. BSFF has been implementing the project entitled '*Work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs*' to consider scopes and recommend measures for further improvement in the regulatory regime in Bangladesh specially with reference to aqua-inputs. As part of the project, the present Study on sample select sample Laboratories and Testing Facilities in Bangladesh was carried out in order to help facilitate their upgradation and where necessary promote a consensus on a designated point for all testing and monitoring activities relating to aqua inputs.

The Study findings are based on information and insights obtained from all the major Department of Fisheries managed or affiliated laboratories and testing facilities and some other key national laboratories and testing institutions which have been helping the GOB in enforcement related supportive activities. The study findings provide valuable information on endowments of these facilities in terms of equipment's and manpower and their present testing capabilities with useful input on, whether they are presently engaged in large scale testing of aqua inputs. It emerges from this study that these facilities have different state of resource endowments with their activities mostly being carried out in response to various GoB requirements and compliance related requirements of countries importing fisheries products from Bangladesh. These facilities, at present, however do not carry out large scale tests of aqua inputs. This is so because as the demand for the same are still limited. The sample laboratories and testing facilities are however willing and eager to undertake such responsibilities with needed Government of Bangladesh help and reinforcement and strengthening of their capacities in specific areas critical for their effective performance. In the study findings have details on the areas where such help should be forthcoming and assured in sustained manner in keeping with growing need of fisheries and aquaculture sector Bangladesh.

Section-1

Introduction and Background:

The Fisheries and Aquaculture sector in Bangladesh plays a major role in the economy of Bangladesh. The contribution of the sector to the country's GNP, overall employment generation and export earnings from export of aquaculture products have consistently been significant. The recent growth in the sector has also been steady. Much of this growth has been due introduction of new production methods, quality seed and feed. Farmers in the sector are also increasingly using aqua inputs of various types. Concern on food safety nationally and internationally has made it imperative that Bangladesh should have good testing facilities to ensure that inputs used in the aquaculture sector and the output there from are regularly tested and monitored. BSFF has been implementing the project- 'Work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs', being implemented by BSFF with support from USAID/World Fish FtF BANA, An important component of this project has been a stock taking exercise on important laboratories facilities in Bangladesh, especially those in a position to be used for testing aqua-inputs. The present report sums up the findings of the exercise.

Objectives of the Study:

1. Relevant details on testing laboratories being managed mainly by the Ministry of Fisheries and Livestock (MoFL), Department of Fisheries (DoF) and other relevant ministries and departments which actually play and/or may play a role in providing testing facilities with reference to aqua inputs.
2. The main present focus of the work currently being carried out by the sample laboratories.
3. Issues relating to the endowment of trained manpower of the surveyed laboratories, adequacy of their budget, laboratory management system, general laboratory safety arrangements, adequacy of electricity supply, adequacy of laboratory chemical waste management, provision for emergency response and similar other technical & management issues.

4. To compile detailed information as much as possible collected through consultations with stakeholders relating to issues relating to the constraints and challenges faced by the sample testing laboratories and specific areas in which future work for improvement should be undertaken.

Methodology followed for the study:

2. The study was conducted following a very comprehensive methodology which comprised both extensive consideration of relevant documents, factual reality of laboratory facilities used by Department of Fisheries and other sample laboratories as well as use of concrete survey approaches both to collect quantitative and qualitative data and information. The methodology followed in course of the study included following broad components.

- Review of previous reports and desktop research.
- Initial inception workshop launching the laboratory component of the work held on 22 August 2019.
- Preparation of a questionnaire and questionnaire-based survey.
- 16 FGD's held in concerned sample laboratories in Khulna, Bagerhat, Dhaka, Mymensingh and Chattogram (List of sample laboratories is at (Annex-01).
- Compilation of information and analysis.

Section 2

Main findings:

3. The exercise carried out by the BSFF study team to obtain detail information helped to have useful interactive meetings with representatives of sixteen sample laboratories including 3 DoF M laboratories and 2 BFRI laboratories which are under the Ministry of Fisheries and Livestock and which are expected to play a significant role in testing aqua inputs as part of their routine activities. The main information on the endowments and work-related realities regarding these sample laboratories can be the basis of future targeted developments. The findings which may be of use in this regard are as follows.

Status of availability of Laboratories Testing Machineries and Equipment:

4. According to the findings of the study team the National Food Safety Laboratory in Dhaka, Analytical Chemistry laboratory of the Atomic Energy Commission, Dhaka, Institute of Food Science Technology, BCSIR, Dhaka, Laboratory at Department of Chemistry, University of Dhaka, Laboratory at Faculty of Fisheries, Chattogram Veterinary and Animal Science University and Animal Nutrition Laboratory, DLS, at Dhaka are some of the most well well-placed laboratories among the sample laboratories covered under the present study in terms of testing machineries and equipment's availability at their disposal. Among the DoF and BFRI laboratories, Quality control Laboratory in Dhaka, Quality Control Laboratory in Chattogram, Quality Control Laboratory at Khulna are well placed in terms of availability of resources. The findings on sample laboratories in terms of their equipment endowments can be seen at table -1 below.

Table-01. Status of Microbiological Testing Machinery/Equipment availabilities

\	Name of Laboratory	Microbiological test/facilities											
1	Quality Control Laboratory, DoF, Dhaka	1	2	3	4	-	6	7	8	9	10	11	12
2	Quality Control Laboratory, DoF, Khulna	1	2	3	4	-	6	7	8	9	10	11	12
3	Quality Control Laboratory,	1	2	3	4	5	6	7	8	9	10	11	12

Microbiological testing Equipment: 1. pH meter, 2. Electronic balance, 3. Conductivity meter, 4. High speed blender, 5. Chlorine Test meter, 6. Refrigerator, 7. Water bath, 9. Colony counter, 10. PCR, 11. Sterilizer, 12. Ultra-Temperature Freezers.

\	Name of Laboratory	Microbiological test/facilities											
	DoF, Chattogram												
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	1	2	-	4	-	6	7	8	9	-	11	12
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	1	2	3	4	5	6	7	8	9	10	11	12
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	3			6	7	8	9	-	11	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	1	2	3	4	5	6	7	8	9	10	11	12
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	2	3	4	5	6	7	8	9	10	11	12
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	2	3	-	-	6-	7	8	9	-	11	
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-				
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	-	-	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	1	2	3	4	5	6	7	8	9	10	11	12
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	2	3	4	5	6	7	8	9	10	11	12
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	2	3	-	5	6	7	8	9	10	11	12
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	1	2	3	4	5	6	7	8	9	10	11	12
16	Department of Aquaculture, FF, BAU, Mymensingh	1	2	3	-	5	6	7	8	9	-	11	-

Microbiological testing Equipment: 1. pH meter, 2. Electronic balance, 3. Conductivity meter, 4. High speed blender, 5. Chlorine Test meter, 6. Refrigerator, 7. Water bath, 9. Colony counter, 10. PCR, 11. Sterilizer, 12. Ultra-Temperature Freezers.

Table: 2. Status of Laboratory Chemical testing Machinery/Equipment availability.

Sl. No.	Name of Laboratory	Details list equipment for Chemical Test.																							
1.	Quality Control Laboratory, DoF, Dhaka	1	-	3	4	5	6	-	8	-	10	11	12	-	14	-	16	17	18	19	20	21	22	23	
2.	Quality Control Laboratory, DoF, Khulna	1	-	3	4	5	6	7	-	-	-	-	12	13	14	-	-	17	18	19	-	21	22	23	
3.	Quality Control Laboratory, DoF, Chattogram	1		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	-	20	21	22	23	
4.	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-	-	14	15	-	17	18	-	20	21		23	
5.	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	5	-	7	8	-	-	-	-					17	18	-	20	21	-	23	
6.	National Food Safety Laboratory, IPH, Mohakhali.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
7.	Analytical Chemistry	1	-	3	-	5	6	7	-	9	10	11	12	-	14	-	16	17	18	19	20	21	22	-	24

Details of equipment: 1. Colorimetry (UV-VIS-IR) and Fluorimetry machines, 2. Electrochemical testing facilities and equipment, 3. GC, 4. GCM, 5. High resolution GCMS, 6. Flame emission, Atomic absorption and atomic fluorescence spectrometry, 7. HPLC, 8. LCMSMS, 9. Ion exchange chromatography, 10. ICP, DCP and ICPMS, 11. Pesticides GC, 12. Volatile Organics GCMS, 13. Physical properties equipment, 14. Titrimetric measurements equipment, 15. Turbidimetric measurements equipment, 16. Ph meter, 17. Balances, 18. Conductivity meter, 19. High speed Blender, 20. Chlorine meter, 21. Refrigerator, 22. Water Baths, 23. Incubators & 24. Freeze dryer.

Sl. No.	Name of Laboratory	Details list equipment for Chemical Test.																							
	Laboratory, Chemistry DIV, AEC, Dhaka.																								
8.	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	-	-	-	5	6	7	8	-	-	-	12	13	14	-	16	17	18	19	20	21	22	23	24
9.	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	2	-	-	-	6	7	8	-	-	-	12	13	14	-	16	17	18	-	-	21	22	23	
10.	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	3	-	5	-	7	8	-	-	11	12	13	-	-	-	-	-	-	-	-	-	-	
11.	Chemistry Laboratory, Department of Chemistry, DU	1	2	3	4	5	6	7	8	9	10	11	12	13	-	-	16	17	18	19	20	21	22	23	
12.	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	5	6	7	8	-	-	11	12	-	14	15	16	17	18	19	20	21	22	23	

Details of equipment: 1. Colorimetry (UV-VIS-IR) and Fluorimetry machines, 2. Electrochemical testing facilities and equipment, 3. GC, 4. GCM, 5. High resolution GCMS, 6. Flame emission, Atomic absorption and atomic fluorescence spectrometry, 7. HPLC, 8. LCMSMS, 9. Ion exchange chromatography, 10. ICP, DCP and ICPMS, 11. Pesticides GC, 12. Volatile Organics GCMS, 13. Physical properties equipment, 14. Titrimetric measurements equipment, 15. Turbidimetric measurements equipment, 16. Ph meter, 17. Balances, 18. Conductivity meter, 19. High speed Blender, 20. Chlorine meter, 21. Refrigerator, 22. Water Baths, 23. Incubators & 24. Freeze dryer.

Sl. No.	Name of Laboratory	Details list equipment for Chemical Test.																							
13.	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	-	3	-	-	6	7	-	-	-	-	-	-	-	-	16	17	18	19	20	21	22	23	
14.	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	1	-	3	-	-	6	7	8	-	10	-	-	13	14	-	-	17	18	19	20	21	22	23	
15.	Fisheries and Marine Resource Technology Discipline(FMRT) KU	1	-	-	-	-	6	7	8	-	-	-	-	13	14	15	16	17	18	19	20	21	22	23	
16.	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-	-	14	15	16	17	18	19	20	21	22	23	

Details of equipment: 1. Colorimetry (UV-VIS-IR) and Fluorimetry machines, 2. Electrochemical testing facilities and equipment, 3. GC, 4. GCM, 5. High resolution GCMS, 6. Flame emission, Atomic absorption and atomic fluorescence spectrometry, 7. HPLC, 8. LCMSMS, 9. Ion exchange chromatography, 10. ICP, DCP and ICPMS, 11. Pesticides GC, 12. Volatile Organics GCMS, 13. Physical properties equipment, 14. Titrimetric measurements equipment, 15. Turbidimetric measurements equipment, 16. Ph meter, 17. Balances, 18. Conductivity meter, 19. High speed Blender, 20. Chlorine meter, 21. Refrigerator, 22. Water Baths, 23. Incubators & 24. Freeze dryer.

5. Representatives of most of the laboratories approached by the BSFF study team noted during the FGDs that continuous attention to provide the laboratories with equipment's needed by them are of vital importance for their successful and effective operation. The representatives of DoF and BFRI laboratories noted in particular they will require to have a comprehensive review of their equipment availability situation in the face of additional workload and specialized nature of tests they will have to undertake as part of testing aqua-inputs in large scales if so requested.

Testing facilities reality:

6. The sample laboratories covered by the BSFF study team were requested to share information regarding the tests presently carried out by them inform that their testing exercise carried out in the recent past did not include aqua-inputs samples of any significant number. All the sample laboratories however, carry out tests of wide ranges, both microbiological and chemical, depending on the requests made therefor. Tables below give details about tests of various types carried out and their parameters with reference to the sample laboratories. Table 2 indicate details on microbiological testing facilities. Table 3.,4,5,6, has information on other important and relevant testing facilities.

Table 3: Reality on microbiological testing protocols in sample laboratories.

Sl. No.	Name of Laboratory	Microbiological test/facilities													
1	Quality Control Laboratory, DoF, Dhaka	1	2	-	4	5	6	-	-	9	10	11	-	-	-
2	Quality Control Laboratory, DoF, Khulna	1	2	-	4	5	5	-	-	9	10	11	12	-	-
3	Quality Control Laboratory, DoF, Chattogram	1	2	-	4	5	6	-		9	10	11	12	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	1	2	-	4	5	-	-	-	-	-	-	-	-	-

Microbiological test/facilities: 1. Fecal Coliform, 2. *E-coli*, 3. Fecal *Streptococcus & enterococcus*, 4. *Salmonella*, 5. *Vibrio Cholerae*, 6. *Vibrio parahaemolyticus*, 7. *Vibrio vulnificus*, 8. *Vibrio alginolyticus*, 9. SPC, 10. *Listeria Monocytogenes*, 11. *Staphylococcus aureus*, 12. 7 OIE listed virus, 13. *Clotridium sp.*, 14. TAMC.

Sl. No.	Name of Laboratory	Microbiological test/facilities													
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	1	2	-	4	5	-	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	-	4	5	6	7	-	9	-	-	12	13	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	2	-	4	5	6	-	-	9	10	11	-	13	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	2	-	4	-	-	-	8	9	-	-	-	-	14
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	2	3	4	-	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	2	3	4	5	-	7	-	9	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	1	2	3	-	-	-	-	-	9	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	1	2	-	4	5	-	-	-	-	-	-	-	-	-

Microbiological test/facilities: 1. Fecal Coliform, 2. *E-coli*, 3. Fecal *Streptococcus & enterococcus*, 4. *Salmonella*, 5. *Vibrio Cholerae*, 6. *Vibrio parahaemolyticus*, 7. *Vibrio vulnificus*, 8. *Vibrio alginolyticus*, 9. SPC, 10. *Listeria Monocytogenes*, 11. *Staphylococcus aureus*, 12. 7 OIE listed virus, 13. *Clotridium sp.*, 14. TAMC.

Table4: Reality on Chemical testing protocols in sample laboratories

Sl. No.	Name of Laboratory	Chemical test/facilities															Remarks if any
1	Quality Control Laboratory, DoF, Dhaka	1	-	-	-	5	6	-	8	9	-	-	-			-	
2	Quality Control Laboratory, DoF, Khulna	1	-	-	-	5	6	-	8	-	-	-	-			-	
3	Quality Control Laboratory, DoF, Chattogram	1	-	-	-	5	6	-	8	9	-	-	-			-	
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	National Food Safety Laboratory, IPH, Mohakhali.	1	-	-	-	5	6	7	8	9	10	11	-		14	15	
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	1	2	3	4	5	6	7	8	9	10	11	-	13	14		
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-	-	-	-	5	6	7	8	-	-	-	-			-	
9	National Control Laboratory (Drugs	1	-	-	-	5	6	-	8	9	-	-	-	-		-	

Chemical test/facilities: 1. Arsenic, 2. Antimony, 3. Barium, 4. Beryllium, 5. Cadmium, 6. Chromium, 7. Copper, 8. Lead, 9. Mercury, 10. Selenium, 11. Sodium, 12. Thallium, 13. Aluminium, 14. Zinc, 15. Iron.

Sl. No.	Name of Laboratory	Chemical test/facilities															Remarks if any
	&Biologicals) DGDA, Mohakhali																
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yet not started test
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-	6	7	-	-	-	11	-	-	-	-	
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	1	-	-	-	-	6	7	8	-	10	-	-	-	-	-	
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	Department of Aquaculture, FF, BAU, Mymensingh	1	-	-	-	-	6	-	8	-	-	-	-	-	-	-	

Chemical test/facilities: 1. Arsenic, 2. Antimony, 3. Barium, 4. Beryllium, 5. Cadmium, 6. Chromium, 7. Copper, 8. Lead, 9. Mercury, 10. Selenium, 11. Sodium, 12. Thallium, 13. Aluminium, 14. Zinc, 15. Iron.

Table 5: Reality on Drug /medicine testing protocols in sample laboratories.

Sl. No.	Name of Lab	Drug/medicine (for disease treatment) test/facilities											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Quality Control Laboratory, DoF, Dhaka	-	-	-	-	-	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	1	-	3	4	5	6	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	3	4	5	6	-	-	-	10	11	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	3	4	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	-	-	3	4	5	-	-	-	-	-	-	12
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-	-	3	4	5	-	-	-	-	-	-	12
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	2	3	4	5	6	7	8	9	10	11	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	-	3	4	5	6	-	-	-	10	-	12
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	2	3	4	5	6	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	12
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-

Drug/medicine (for disease treatment) test/facilities: 1. Amoxicillin, 2. Ampicillin, 3. Tetracycline, 4. Oxy tetracycline, 5. Chlortetracycline, 6. Sulphonamides, 7. Oxalinic Acid, 8. Kanamycin A., 9. Neomycin, 10. Gentamycin, 11. Tylosin, 12. Any other.

Table 6: Reality on Dye testing protocols in sample laboratories (for disease treatment).

SI No.	Name of Laboratory	Dyes (for disease treatment) testing facilities				
		1	2	3	4	5
1	Quality Control Laboratory, DoF, Dhaka	1	2	3	4	-
2	Quality Control Laboratory, DoF, Khulna	1	2	3	4	-
3	Quality Control Laboratory, DoF, Chattogram	1	2	3	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	3	4	5
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	2	3	4	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	-	3	-	5
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-

Dyes (for disease treatment) testing facilities: 1. Malachite green, 2. Leuco-malachite green, 3. Crystal Violet, 4. Leuco-crystal violet, 5. Methylene Blue.

Table 7: Tests on Prohibited antibiotics.

Sl. No.	Name of Laboratory	Prohibited antibiotics (parent drug & residue) test/facilities								
		1	-	-	-	-	-	7	8	-
1	Quality Control Laboratory, DoF, Dhaka	1	-	-	-	-	-	7	8	-
2	Quality Control Laboratory, DoF, Khulna	1	-	-	-	-	-	7	8	9
3	Quality Control Laboratory, DoF, Chattogram	1	-	-	-	-	-	7	8	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	1	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	-	-	-	-	-	-	-	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	-	-	-	-	-	7	8	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	-	3	-	-	-	7	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	-	-	-	5	6	7	8	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	1	-	-	-	-	-	-	8	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-

Prohibited antibiotics (parent drug & residue) test/facilities:1. Chloramphenicol, 2. Chloroform, 3. Chlorpromazine, 4. Colchicine, 5. Dapsone, 6. Dimetridazole, 7. Metronidazole, 8. Nitrofurans (Including furazolidone), 9. Ronidazole.

Table 8: Composite analytical capacity to deal with chemical compounds used in aquaculture as disinfectant.

Sl. No.	Name of Laboratory	Composite analytical capacity of chemical compounds used in aquaculture as disinfectant										
1	Quality Control Laboratory, DoF, Dhaka	-	-	-	-	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-	-	-	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-	4	-	-	-	-	-	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	-	-	-	4	-	-	7	-	-	-	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-	-	-	-	-	-	-	-	-	-	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-	-	-	-	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	6	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-	-	-

Composite analytical capacity of chemical compounds used in aquaculture as disinfectant: 1. EDTA, 2. Bleaching, 3. Water Clear (Such as Sodium-thio-Sulphate), 4. Formalin, 5. Benzalkonium Chloride, 6. Copper sulphate, 7. Iodine, 8. Lime-(CaO, Ca(OH)₂) 9. Zeolite (a Complex compound), 10. Si, Ca, Al, Fe, Mg, Na and its oxide), 11. Rotenone.

Table 9: Hormones related tests.

Sl. No.	Name of Laboratory	Hormones used in aquaculture						
1	Quality Control Laboratory, DoF, Dhaka	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-	-	5	-	7
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	-	-	-	-	-	-	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-	-	-	-	-	-	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	4	5	6	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	-	-	4	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-

Hormones used in aquaculture: 1.PG, LRH and FSH, 2. Ova prim, HCG, 3.Glycoprotein, 4.17 β Estradiol, 5.17 α -Methyl Testosterone, 6.17 α -Ethyl Testosterone, 7.Any Other.

Table 10: Test performance reality including with reference Probiotics testing facilities.

Sl. No.	Name of Laboratory	Probiotics testing facilities												
1	Quality Control Laboratory, DoF, Dhaka	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	1	2	-	-	-	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	-	-	4	-	-	-	-	-	-	-	-	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	2	-	-	5	-	-	-	-	-	-	-	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University (CVASU)	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline (FMRT) KU	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-	-	-	-	-

Probiotics testing facilities: 1. *Bacillus* sp., 2. *Lactobacillus* sp., 3. *Vipcone* sp., 4. *Bacillus subtilis*, 5. *Bacillus liceniformis*, 6. *Enterococcus* sp., 7. *Bacillus amyloliquifeciense*, 8. *Micrococcus* spp., 9. *Pediococcus* sp., 10. *Vagococcus* sp., 11. *Nitrobacter* sp., 12. *Pseudomonas* sp., 13. *Rhodobacter* sp.

Table 11: Pesticides related test.

Sl. No.	Name of Laboratory	Pesticides testing facilities								
1	Quality Control Laboratory, DoF, Dhaka	-	-	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-	-	-	-	-	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	1	2	3	4	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	3	4	5	6	-	8	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	1	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.									
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-	-	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	2	3	4	5	6	7	9	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-	-	-	-	-	-	-

Pesticides: 1.DDT, 2.Aldrin, 3. Heptachlor, 4. Di-Eldrin, 5.Organo-phosphorus, 6.Pyrethroids, 7. Carbamate, 8.PCBs, 9. Any Other.

Table 12: Test performance reality including with reference Vitamins used in aquaculture.

Sl. No.	Name of Laboratory	Vitamin		
1	Quality Control Laboratory, DoF, Dhaka	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	2	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	2	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	2	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University (CVASU)	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-
15	Fisheries and Marine Resource Technology Discipline (FMRT) KU	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-	-

Vitamins:1. Water soluble vitamins, 2.Fat soluble vitamins, 3.Any Other

Table 13: Tests on Anthelmintic used in aquaculture:

Sl. No.	Name of Laboratory	Tests on Anthelmintic	
		1	2
1	Quality Control Laboratory, DoF, Dhaka	1	2
2	Quality Control Laboratory, DoF, Khulna	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	-	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	1	2
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-	-

Anthelmintic: 1. Mebendazole, 2.Fenbendazole

Table 14.: Mycotoxin testing in aqua inputs.

Sl. No.	Name of Laboratory	Mycotoxin tests								
1	Quality Control Laboratory, DoF, Dhaka	1	1	-	-	-	-	-	-	-
2	Quality Control Laboratory, DoF, Khulna	-	-	-	-	-	-	-	-	-
3	Quality Control Laboratory, DoF, Chattogram	-	-	-	-	-	-	-	-	-
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	-	-	-	-	-	-	-	-	-
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-	-	-	-	-	-	-	-	-
6	National Food Safety Laboratory, IPH, Mohakhali.	1	1	-	-	-	-	-	-	9
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-	-	-	-	-	-	-	-	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	1	1	-	-	-	-	-	-	9
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-	-	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-	-	-	-	-	-	-	-	-
11	Chemistry Laboratory, Department of Chemistry, DU	1	1	-	-	-	-	-	-	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-	-	-	-	-	-	-	-	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	1	-	-	-	-	-	-	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	1	1	-	-	-	-	-	-	-
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-	-	-	-	-	-	-	-	-
16	Department of Aquaculture, FF, BAU, Mymensingh	1	-	-	-	-	-	-	-	-

Mycotoxin: 1. Afla toxin-B₁, B₂, 2.Afla toxin-G₂, GNo, 3.Dinoflagellate (*Pfiesteria piscicida*), 4. Saxitoxin, 5. Cyanotoxins, 6. Microcystin, 7. Cylindrospermops, 8.Any Other.

Table 15: Bovine and Swine tissue test with reference to Meat and bone meal.

Sl. No	Name of Laboratory	Meat and bone meal.
1	Quality Control Laboratory, DoF, Dhaka	-
2	Quality Control Laboratory, DoF, Khulna	-
3	Quality Control Laboratory, DoF, Chattogram	1
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	1
5	Quality Control and Nutrition Laboratory, Shrimp Research Station, BFRI, Bagerhat	-
6	National Food Safety Laboratory, IPH, Mohakhali.	-
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	-
8	Institute of Food Science Technology (IFST) Laboratory, BCSIR, Dhaka.	-
9	National Control Laboratory (Drugs & Biologicals) DGDA, Mohakhali	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	-
11	Chemistry Laboratory, Department of Chemistry, DU	-
12	Faculty of Fisheries Laboratory, Chottagram Veterinary & Animal Science University(CVASU)	-
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	-
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	1
15	Fisheries and Marine Resource Technology Discipline(FMRT) KU	-
16	Department of Aquaculture, FF, BAU, Mymensingh	-

7. In course of the present project the BSFF study team also carried out important work on preparation of inventory of aqua inputs presently increasingly being used by farmers at the grow out level. The preliminary findings of aqua-inputs being marketed by BAPCA and AHCAB members indicate that the majority of them, as reflected at Table 4 below, are vitamins/minerals, Drugs¹, Biologics², Disinfectants³ and Pesticides⁴.

Bovine and Swine: 1. Meat and bone meal.

Table-16. List of different classes of Aqua inputs.

Sl. No.	Types of Products	Number of Brands	% of total	Percentage of products of domestic origin (%)	Percentage of products of imported origin (%)	Origin/Source of Products
1	Drugs	52	11	8	92	Bangladesh, Belgium, China, France, Germany, India Taiwan, UK USA, Vietnam
2	Biologics	86	19	0	100	Belgium, Bhutan, China, France, India, Indonesia, Japan, Taiwan, Thailand, Turkey, USA, Vietnam, Australia, Netherlands, Korea, Peru, Singapore, Spain, Italy, UK, Brazil, Lithuania,
3	Disinfectant	154	34	6	94	Bangladesh, China, England, France, Germany, India, Indonesia, Japan, Netherlands, Taiwan, Thailand, USA, Vietnam.
4	Pesticides	8	2	88	12	Bangladesh, Brazil, China, Germany, India, Indonesia, Japan, Korea, Lithuania, Netherlands, Singapore, Spain, Taiwan, Thailand, USA, Vietnam.
5	Other: Vitamins, Mineral and Herbal Extracts	155	34	21	79	Bangladesh, China, India, Indonesia, Mexico, Peru, Taiwan, Thailand.

Source: Findings on aqua inputs inventory prepared as part of the project entitled ‘Work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs’

8. From the perspective of the reality presented in table above, it appears important that all the concerns laboratories to be utilized by the Competent Authorities of Government of Bangladesh and **the stakeholders from the private sectors should be in a position to carry out the broad range of tests which will be needed to test the above category of aqua-inputs, with full knowledge of methods, procedures and parameters to be tested.** The findings of the

present project on inventory of inputs should be able to help carry out the necessary planning and arrangements for capacity building and managerial improvisation of operation of selected lab.

Manpower endowments and broader issues relating to training:

9. Any well performing laboratory needs to have adequate qualified and skilled manpower at the managerial level and actual operational level in the lab environment to undertake specialized testing assignments. In course of the FGDs conducted by the BSFF study team members representative from all the sample laboratories noted that they will benefit in their future performance with added focus on testing of aqua-inputs from the strengthening of the skilled manpower base of their existing institution.

10. Training of Laboratory personnel including refreshers training course, ensuring attractive compensation packages and carrier paths with a scope for promotion were identified as major steps deserving due consideration. Some of the FGD participants from the sample laboratories noted that in specific instances the laboratory technicians have been recruited as part of some projects so that there is no job security for them beyond the project period which creates uncertainties about sustaining the laboratory activities and their consistence performance in keeping with felt needs. They also noted that the absences of assured career paths in some of the sample laboratories with scope for promotion also acts as a disincentive for both permanent and non-permanent laboratory personnel to continue in their laboratory related responsibilities. The findings of the study team on these issues are summarized in the table 5 below.

Table-17: Manpower, Skilled Personnel and training need related findings.

Sl. No.	Name of Lab	Present manpower sufficient	Needs additional Manpower for aqua-input related activities	Needs trainings for Staff including refresher training courses	Needs attractive compensation packages with define career path for promotion.
1	Quality Control Laboratory, DoF, Dhaka	1	2	3	4
2	Quality Control Laboratory, DoF, Khulna	1	2	3	4
3	Quality Control Laboratory, DoF, Chattogram	1	2	3	4
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh	1	2	3	4
5	Quality Control and Nutrition Lab, Shrimp Research Station, BFRI, Bagerhat	1	2	3	4
6	National Food Safety Laboratory, IPH, Mohakhali.	1	2	3	4
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.	1	-	3	-
8	Institute of Food Science Technology (IFST) Lab, BCSIR, Dhaka.	1	2	3	4
9	National Control Lab (Drugs & Biologicals) DGDA, Mohakhali	-	-	-	-
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.	1	2	3	4

Manpower and skilled personnel related issues: 1. Manpower available is adequate, 2. Needs additional manpower, 3. Needs trainings for Staff including refresher training courses, 4. Needs attractive compensation packages with define career path for promotion.

Sl. No.	Name of Lab	Present manpower sufficient	Needs additional Manpower for aqua-input related activities	Needs trainings for Staff including refresher training courses	Needs attractive compensation packages with define career path for promotion.
11	Chemistry Lab, Department of Chemistry, DU	1	2	3	4
12	Faculty of Fisheries Lab, Chottagram Veterinary & Animal Science University (CVASU)	1	2	3	4
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.	1	2	3	4
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.	-	-	-	4
15	Fisheries and Marine Research Technology Discipline (FMRT) KU	1	2	3	4
16	Department of Aquaculture, FF, BAU, Mymensingh	-	2	3	4

Resources for Laboratories:

11. The representatives of sample laboratories noted that adequate resources to meet both fixed development cost including investments in new and replacement equipment where needed, regular maintenances of existing equipment, costs to be defrayed in accessing licensed and patented expensive methods and cost for critically needed sufficient laboratory inputs including quality standard reagents should also have priority attention of the Competent Authorities relevant GoB Ministries and Departments. The study findings on these issues are summarized in table -6 below.

Manpower and skilled personnel related issues: 1. Manpower available is adequate, 2. Needs additional manpower, 3. Needs trainings for Staff including refresher training courses, 4. Needs attractive compensation packages with define career path for promotion.

Table-18. Table on budget and resource issues.

Sl. No.	Name of Laboratory	Present budget is adequate	Needs additional resources for aqua-input related activities	Needs resources to meet costs to be defrayed in accessing licensed and patented expensive methods	Needs resources for quality standard reagents	Need resources for Lab accreditation, method validation, PT Test, etc.
1	Quality Control Laboratory, DoF, Dhaka	1	2	3	4	5
2	Quality Control Laboratory, DoF, Khulna	1	2	3	4	5
3	Quality Control Laboratory, DoF, Chattogram	1	2	3	4	5
4	Disease and Nutrition Laboratories, Freshwater Station, BFRI, Mymensingh		2	3	4	5
5	Quality Control and Nutrition Lab, Shrimp Research Station, BFRI, Bagerhat		2	3	4	5
6	National Food Safety Laboratory, IPH, Mohakhali.		2	3	4	5
7	Analytical Chemistry Laboratory, Chemistry DIV, AEC, Dhaka.		2	3	4	5
8	Institute of Food Science Technology (IFST) Lab, BCSIR, Dhaka.		2	3	4	5
9	National Control Lab (Drugs & Biologicals)		2	3	4	5

Resource adequacy, need for additional resources and purposes for which resources needed: 1. Present budget is adequate, 2. Needs additional resources for aqua-input related activities, 3. Needs resources to meet costs to be defrayed in accessing licensed and patented expensive methods, 4. Needs resources for quality standard reagents, 5. Need resources for Lab accreditation, method validation, PT Test etc.

	DGDA, Mohakhali					
10	Pesticide Laboratory Plant Protection Wing, DAE, Dhaka.		2	3	4	5
11	Chemistry Lab, Department of Chemistry, DU		2	3	4	5
12	Faculty of Fisheries Lab, Chottagram Veterinary & Animal Science University (CVASU)		2	3	4	5
13	Bangladesh Livestock Research Laboratory (BLRI), Savar, Dhaka.		2	3	4	5
14	Animal Nutrition Laboratory, DLS, Khamarbari, Dhaka.		2	3	4	5
15	Fisheries and Marine Research Technology Discipline (FMRT) KU		2	3	4	5
16	Department of Aquaculture, FF, BAU, Mymensingh		2	3	4	5

12. In the context of consideration of resource adequacy or need it is worth noting that, the FGD participants contacted by the BSFF team informed that only DoF operated sample laboratories can retain the service charges from tests performed for their own expenses which provide a resource cushion which other sample laboratories cannot do.

Resource adequacy, need for additional resources and purposes for which resources needed: 1. Present budget is adequate, 2. Needs additional resources for aqua-input related activities, 3. Needs resources to meet costs to be defrayed in accessing licensed and patented expensive methods, 4. Needs resources for quality standard reagents, 5. Need resources for Lab accreditation, method validation, PT Test etc.

Section 3

Conclusion:

13. The comprehensive exercise carried out by the BSFF team helped to have a useful picture of the sample laboratories with reference to their equipment availability, present tests carried out by them, their manpower and technical personnel as well as resource position was specially revealing as regards their present status, challenges and possible interventions needed to meet their specific requirements. From the study findings the main relevant facts on these issues can be generalized in fairly broad terms. **Specific actions for improvement in all these areas will require a more focused and detailed exercise on a laboratory by lab basis with specific reference to their assigned responsibilities.**

14. The contents in the present report was shared in a validation workshop held in Dhaka on 24 October, 2019. The validation workshop's participants included, among others, representatives from Ministry of Fisheries and Livestock, Senior officials from Department of Fisheries and representatives from sample laboratories. It was the general sense of discussion during the validation workshop that the report on sample testing laboratories shared with participants can serve as useful reference and basis for further future work by the GOB, its concerned departments, affiliated institutions, private sector stakeholders, development partners and specialized institutions like BSFF working for the sustained development of the fisheries and aquaculture sector in Bangladesh. The participants during the workshop also were of the view that while the Government and Department of Fisheries may identify a number of specific testing laboratories to carry on test on aqua inputs, establishing a network between them and reference laboratories to carry out specialized test of aqua inputs which needed special capacities and expertise on a need basis.

Annexure

Annex -01: Questionnaire for FGD data collection.

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Name of Respondent:.....

Designation:.....

Date of Interview:.....Time:.....

1. General Information					
Name of Laboratory:					
Location of Laboratory:					
Physical Address:					
Mailing Address:					
Phone:					
Facemail:					
Cell No:					
Email address:					
web if any:					
2. Supplementary additional information on the laboratory:					
Sl. No.	Questions	Yes	No	N/A	Remarks
2.1	Are there multiple locations/branch /outreach of the facility?				
2.1.1	If yes, pls mention the no. of facilities and their locations in the remarks column				
2.2	Is laboratory associated with other general reference labs or public health facilities? Please mention name				
2.3	GOB approved (approved by concerned Ministry/Department)				
2.3.1	Year of approval:				
2.4	LIA/ISO approved:				
2.4.1	Year of LIA/ISO approval				
2.5	Bangladesh Accreditation Board approved				
2.5.1	1 st accreditation (Year):				
2.5.2	Present status of accreditation:				
2.6	The Lab is accredited for how many parameters? Please list the parameters for which there are accreditation.				
2.7	Self-managed without Govt. approval				
2.7.1	Year of establishment in above case:				
3 Laboratory Management and Technical Manpower					
3.1	Laboratory Operational Head:				
	Name:				
	Designation:				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Questions	Yes	No	N/A	Remarks
	Qualification:				
	Nature of tenure -----Permanent appointment to the post / Temporarily assigned Permanent/ Temporary / On deputation from another Dept.				
3.2	Does the organogram have provision for technical sufficient man power?				
3.3	Technical manpower				
3.4	Total Number of Staff:(Male/Female/Others)				
3.5	Permanent/Temporary staff				
3.6	Permanent staff.....No.....Temporary staff.....No..... 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.				
3.7	Number of Staff on deputation from another Department				
3.8	Does the laboratory presently have sufficient Technical staff in all the post mentioned in the organogram				
3.9	Scope for promotion for lab permanent staff:				
4	Budget:				
4.1	Source:				
	1. Ministry/Department/Organization				
	2. Lab's own income				
	3. Main source of income:				
	4. Can the Lab use its own income?				
	5. Is the lab's income sufficient to meet its development expense?				
5	Laboratory Management:				
5.1	Whether lab have written policy of quality control system of the testing protocols				
5.2	Have written SOPs been developed to cover laboratory operation activity?				
5.3	Are laboratory provided specific safety related training and it is documented				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Questions	Yes	No	N/A	Remarks
5.4	Is laboratory personal familiar with the chemical hygiene plan, biosafety manual and others related safety issues?				
5.5	Are any approval or review process in place for introduction of new test?				
5.6	Does the laboratory have policies on conflict of interest for its personnel?				
5.7	Does the laboratory have documented policy and procedures for ensuring the protection of clients' confidential information and proprietary rights, including procedures for protecting the electronic storage and transmission of results.				
6	Laboratory Testing Capacity Assessment:				
6.1	Quality System assessments:				
6.1.1	Does the laboratory have regular program of participation in proficiency Test (PT)?				
6.1.2	Does the Laboratory have program to compare test results with results from other accredited laboratories?				
6.1.3	Does the laboratory perform any Intra laboratory testing concerning the PT test?				
6.1.4	Does the laboratory specify the job responsibility, authority and coordinated performance by all laboratory personnel (intra laboratory coordination) to perform the test?				
6.1.5	Does the laboratory have adequate supervision of testing staff?				
6.1.6	Does the laboratory have proper technical management which has overall responsibility for the technical operations and provisions of resources needed to ensure the quality of laboratory operations?				
6.1.7	Does the laboratory provide supervision by persons familiar with the approved test methods and procedures, the objectives of the test and the assessment of the results?				
6.1.8	Does the laboratory Quality Assurance provision in the Laboratory to notify laboratory management of deficiency in quality assurance, monitoring and corrective action?				
6.1.9	Does the laboratory have plans and procedures for sampling?				
6.1.10	Does the Laboratory record the condition of the sample upon receipt of the sample?				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Questions	Yes	No	N/A	Remarks
6.1.11	Does the laboratory maintain unique identification (ID) code of each sample?				
6.1.12	Does the laboratory retain all documents that is transmitted to the laboratory by the sample transmitter?				
6.1.13	Does the laboratory have equipment's calibration system?				
6.1.14	Does the laboratory have testing capacity of Aquaculture Chemicals, Drugs/medicines, Hormones, Pre and Pro-biotic, Vitamins/minerals, Herbal etc.				
7	Laboratory testing machineries assessment:				
7.1	Chemical Testing equipment				
7.1.1	Does the laboratory have following equipment's for testing above parameters?				
7.1.2	i. Colorimetry (UV-VIS-IR) and Fluorimetry machines				
7.1.3	If yes, Number of tests performs per day				
7.1.4	ii. Electrochemical testing facilities and equipment's				
7.1.5	If yes, Number of tests performs per day				
7.1.5.1	a. GC				
7.1.5.2	b. GCM				
7.1.5.3	c. High resolution GCMS				
7.1.5.4	d. Flame emission, Atomic absorption and atomic fluorescence spectrometry.				
7.1.5.5	e. HPLC				
7.1.5.6	f. LCMSMS				
7.1.5.7	g. Ion exchange chromatography				
7.1.5.8	h. ICP, DCP and ICPMS				
7.1.5.9	i. Pesticides GC				
7.1.5.10	j. Volatile Organics GCMS				
7.1.5.11	k. Physical properties equipment's				
7.1.5.12	l. Titrimetric measurements equipment's				
7.1.5.13	m. Turbidimetric measurements equipment's				
7.2	Microbiological testing equipment:				
7.2.1	i. Ph meter				
7.2.2	ii. Balances				
7.2.3	iii. Conductivity meter				
7.2.4	iv. High speed Blender				
7.2.5	v. Chlorine meter				
7.2.6	vi. Refrigerator				
7.2.7	vii. Water Baths				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Questions	Yes	No	N/A	Remarks
7.2.8	viii. Incubators.				
7.2.9	Any other, if necessary, please use separate sheet.				
8	General Laboratory Safety Arrangement as per ISO Guidelines:				
8.1	Lab emergency contact information is posted at lab entrance				
8.2	Any warning sign are posted for any specific hazards				
8.3	Are appropriate safety eye wear, gloves, lab coats and other personal protective is available at the entrance and used?				
8.4	Are all exists free and unobstructed?				
8.5	Are corridors/aisles clear and without graceful hazards?				
8.6	Safety of Equipment & its Maintenance.				
8.7	An operable eyewash and emergency shower are readily available.				
8.8	Fire extinguisher are available, unobstructed and operational.				
8.9	Chemical fume hoods are available, operational in lab.				
8.10	Biological safety cabinets are available and operational in lab				
8.11	Annual inspection and monitoring system available in the lab about safety of equipment's				
8.12	Any written annual equipment's 's maintenances schedule of lab and which is followed strictly.				
9	Adequate Power Supply & Electrical Safety:				
9.1	Does the laboratory have adequate power supply system				
9.2	Does the laboratory have adequate alternate power supply system in case of emergency or load shedding?				
9.3	Does the high voltage are shielded and adequately marked and labeled?				
9.4	Does the laboratory have adequate power supply system				
9.5	Does the laboratory have adequate safety device of power cords and switz				
9.6	Are Electric cords not frayed or damaged				
10	Lab Chemical waste management:				
10.1	Does the laboratory have written waste management policy?				
10.2	Does the laboratory have chemical waste containers are labeled and lids are auto closed -?				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Questions	Yes	No	N/A	Remarks
10.3	Does the laboratory have segregated chemical waste by hazard class?				
10.4	Does the laboratory have waste storage system is minimized and full waste containers are not allowed to accumulate-?				
10.5	Does bio hazardous waste containers display the universal bio-hazard warning label?				
10.6	Does the laboratory have sharps collected in puncture-proof, leak proof containers displaying the bio-hazard warning label?				
11	Service-related other details:				
11.1	Specify the main category of service seekers –who usually sends samples for testing?				
	1				
	2				
	3				
11.2	Your laboratory sends test results to ordering users using the following medium:				
	a. Mail/Fax				
	b. Electronic free text format				
	c. Electronic no fixed format				
11.3	Does your laboratory share test results with users using the following medium as well?				
	a. Web portal provided by lab				
	b. Web portal provided by third party				
	c. Third party middleware vendors.				
12	Provision for Emergency response:				
12.1	Do the lab personnel have training to properly respond to spill over, fire and other accident scenarios?				
12.2	Are chemical spill cleanup materials available?				
12.3	Are first aid kits available and appropriately stocked?				
12.4	Are emergency phone number of labs available for ready use?				
13	Payment for services:				
13.1	Are services provided free of charge?				
13.2	Does services provided require payment of fees?				
14	Private sector stakeholders use the lab. Facilities:				
14.1	Does the private sector stakeholder use the laboratory facilities?				
14.2	If the reply is in negative, please specify reasons-				
	a.				
	b.				

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

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Sl. No.	Questions	Yes	No	N/A	Remarks
	c.				
14.3	Does the laboratory have arrangement to inform private sector stakeholders about the facilities' for testing available in it?				
14.4	Miscellaneous and additional points, particularly relating to possible recommendations for future greater use for lab facilities:				
	a.				
	b.				
	c.				
15	Additional and enhanced facilities you would like to have in your laboratory:				
	1				
	2				
	3				
	4				
	5				
	6				
16	Please mention what are the major constraints that your laboratory face:				
	1.				
	2.				
	3.				
	4.				
	5.				
	6.				
	7.				
	8.				
	9.				
	10.				
17	Miscellaneous points mentioned by respondents on lab's capacity, function, management and budget not covered by specific questions in the questionnaires				
	1.				
	2.				
	3.				
18	Please share information about plans for development of testing scopes of the laboratory:				
	1.				
	2.				
	3.				
Signature:		Signature:			
Name of Investigator: Bangladesh Shrimp and Fish Foundation		Name of Lab in Charge: Name of Laboratory:			

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

19. Status of Different Testing Facilities:

Sl. No.	Test parameters	Equipment	Method	Screening	Confirmative	PT Status	Accreditation status	Parent/Residue
19.1	Microbiological test/facilities							
19.1.1	Fecal Coliform							
19.1.2	E-coli							
19.1.3	Fecal Streptococcus & enterococcus							
19.1.4	Salmonella.							
19.1.5	Vibrio Cholerae							
19.1.6	Vibrio parahaemolyticus							
19.2	Chemical test/facilities							
19.2.1	Arsenic							
19.2.2	Antimony							
19.2.3	Barium							
19.2.4	Beryllium							
19.2.5	Cadmium							
19.2.6	Chromium							
19.2.7	Copper							
19.2.8	Lead							
19.2.9	Mercury							
19.2.10	Selenium							
19.2.11	Sodium							
19.2.12	Thallium							
19.3	Drug/medicine (for disease treatment) test/facilities							
19.3.1	Amoxicillin							
19.3.2	Ampicillin							
19.3.3	Tetracycline							
19.3.4	Oxy tetracycline							
19.3.5	Chlortetracycline							

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Test parameters	Equipment	Method	Screening	Confirmative	PT Status	Accreditation status	Parent/Residue
19.3.6	Sulphonamides							
19.3.7	Oxalinic Acid							
19.3.8	Kanamycin A.							
19.3.9	Neomycin							
19.4	Dyes (for disease treatment) testing facilities							
19.4.1	Malachite green							
19.4.2	Leuco-malachite green							
19.4.3	Crystal Violet							
19.4.4	Leuco-crystal violet							
19.4.5	Methylene Blue							
19.5	Prohibited antibiotics (parent drug & residue) test/facilities							
19.5.1	Chloramphenicol							
19.5.2	Chloroform							
19.5.3	Chlorpromazine							
19.5.4	Colchicine							
19.5.5	Dapsone							
19.5.6	Dimetridazole							
19.5.7	Metronidazole							
19.5.8	Nitrofurans (Including furazolidone)							
19.5.9	Ronidazole							
19.6	Composite analytical capacity of chemical compounds used in aquaculture as disinfectant							
19.6.1	EDTA							
19.6.2	Bleaching							
19.6.3	Water Clear (Such as Sodium thio Sulphate)							
19.6.4	Formalin							

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Test parameters	Equipment	Method	Screening	Confirmative	PT Status	Accreditation status	Parent/Residue
19.6.5	Benzal Konium Chloride							
19.6.6	Copper sulphate							
19.6.7	Iodine							
19.6.8	Lime-(CaO, Ca(OH) ₂)							
19.6.9	Zeolite (a Complex compound of, Si, Ca, Al Fe, Mg, Na and its oxide)							
19.6.10	Rotenone							
19.7	Hormones used in aquaculture							
19.7.1	PG, LRH and FSH							
19.7.2	Ova prim, HCG							
19.7.3	Glycoprotein							
19.7.4	17β Estradiol							
19.7.5	17α-Methyl Testosterone							
19.7.5	17α-Ethyl Testosterone							
19.8	Probiotics testing facilities							
19.8.1	<i>Bacillus sp.</i>							
19.8.2	<i>Lactobacillus sp.</i>							
19.8.3	<i>Vipcone sp.</i>							
19.8.4	<i>Bacillus subtilis</i>							
19.8.5	<i>Bacillus liceniformis</i>							
19.8.6	<i>Enterococcus sp.</i>							
19.8.7	<i>Bacillus amyloliquifeciense</i>							
19.8.8	<i>Micrococcus spp.</i>							
19.8.9	<i>Pediococcus sp.</i>							

Questionnaires on laboratory capacity assessment as part of the project 'work on policy consolidation, improvement in licensing, management process and effective use of aqua inputs' being implemented by FtF BANA-BSFF.

Activity Code-5.4

Sl. No.	Test parameters	Equipment	Method	Screening	Confirmative	PT Status	Accreditation status	Parent/Residue
19.8.10	<i>Vagococcus sp.</i>							
19.8.11	<i>Nitrobacter sp.</i>							
19.8.12	<i>Pseudomonas sp.</i>							
19.8.13	<i>Rhodobacter sp.</i>							
19.9	Pesticides testing facilities							
19.9.1	Organo Chlorine							
19.9.2	Aldrin							
19.9.3	Heptachlor							
19.9.4	Di Aldrin							
19.9.5	Organo phosphorus							
19.9.6	<i>Pyrethroids</i>							
19.9.7	<i>Carbamate</i>							
19.9.8	PCBs							
19.10	Vitamins							
19.10.1	Water soluble vitamins							
19.10.2	Fat soluble vitamins							
Signature:					Signature:			
Name of Investigator: Bangladesh Shrimp and Fish Foundation					Name of Lab in Charge: Name of Laboratory:			

Annex -2:FGD Guidelines for Discussions to be held at sample test laboratories

The BSFF Team may generally focus its discussion at the sample laboratories on the following:

1. In general, on the present work orientation of the laboratory. Does it presently test aqua inputs?
 - a. If not, if it was to be given the responsibility will it be interested to do so?
2. How would the laboratory fare in terms of various endowments and capacities? Can a list of main instruments and machineries be shared?
3. What types of tests can be performed or actually are being performed by the laboratory?
4. General question regarding the manpower, their lab works related competence, compensation packages for lab hands, job security and career path related issues along with a focus on training related matters
5. Important issues relating to resources both for investment in their machineries and maintenance, meeting routine operational costs including costs for adequate quality reagents and other inputs needed for testing facilities
6. Present arrangements for recovering cost for charges from entities or persons requesting for testing and how are the resources so generated used? Can the lab retain such proceeds for its own use?
7. General issues relating to standard operational guidelines, organogram of the lab, facilities available for maintenance of machineries, power supply, waste management and safety safeguards
8. Any other questions or issues?