



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Feed the Future Bangladesh Aquaculture and Nutrition Activity

Environmental Mitigation and Monitoring Plan



USAID
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ENVIRONMENTAL MITIGATION AND MONITORING PLAN

Feed the Future Bangladesh Aquaculture and Nutrition Activity

February 2018 to February 2023

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Disclaimer:

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ACRONYMS AND ABBREVIATIONS

22 CFR 216	Title 22 of the Code of Federal Regulations, Part 216
AI	Active Ingredient
A.I.D.	Agency for International Development
ADS	Automated Directive Systems
AIN	Feed the Future Aquaculture for Income and Nutrition Activity
AOR	Agreement Officer's Representative
BEO	Bureau Environmental Officer
BFRI	Bangladesh Fisheries Research Institute
BMP	Best Management Practice
CC	Climate Change
CE	Categorical Exclusion
CGIAR	Consultative Group for International Agricultural Research
CoP	Chief of Party
CRM	Climate Risk Management
CS	Communication Specialist
DCoP	Deputy-Chief of Party
DFO	District Fisheries Officer
DLS	Department of Livestock Services
DoE	Department of Environment
DoF	Department of Fisheries
EA	Environmental Assessment
EC	European Commission
ECA	Ecological Critical Area
EDD	Environmental Due Diligence
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMMP	Environmental Mitigation and Monitoring Plan
ER Checklist	Environmental Review and Assessment Checklist
ES	Environment Specialist
FAA	U.S. Foreign Assistance Act
FFD	Farmers' Field Day
FI	Financial Institution
GAP	Good Agricultural Practice
GOB	Government of Bangladesh
GT	Grants Team
H	High
ICLARM	International Center for Living Aquatic Resources Management
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
IEI	Integrated Environmental Indicators
IPM	Integrated Pest Management
L	Low
LSP	Local Service Provider
M	Moderate
MELT	Monitoring Evaluation and Learning Team
MEO	Mission Environmental Officer
MIS	Management Information System
MPA	Marine Protected Areas
MSDS	Market System Development Specialists
MSDT	Market System Development Team
MTF	Memorandum to File
ND	Negative Determination

NDC	Negative Determination with Conditions
NEPA	U.S. National Environmental Policy Act
PA	Protected Area
PD	Positive Determination
PER	Pesticide Evaluation Report
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PI	Process Indicator
PPE	Personal Protection Equipment
QARs	Quarterly and Annual Reports
RCE	Requests for Categorical Exclusion
Reg. 216	Regulation 216
RUP	Restricted Use Pesticide
SEI	Stand-alone Environmental Indicators
SIS	Small Indigenous Species
SOW	Scope of Work
SS	Scoping Statement
SUAP	Safe Use Action Plan
SVRF	Site Visit Reporting Form
TA	Technical Assistance
The Activity	Feed the Future Bangladesh Aquaculture and Nutrition Activity
TOR	Terms of Reference
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
USFDA	United States Food and Drug Administration
USG	United States Government
ZOI	Feed the Future Zone of Influence

EXECUTIVE SUMMARY

The five-year assistance activity, *Feed the Future Bangladesh Aquaculture and Nutrition Activity*, was awarded by the USAID to the Grantee, International Center for Living Aquatic Resources Management (ICLARM), doing business as WorldFish, on 6 February 2018, and is expected to continue until 5 February 2023 with US \$24.5 million funding. The Activity was built to keep the momentum generated by the *Feed the Future Aquaculture for Income and Nutrition Activity (AIN)*, and to achieve inclusive aquaculture sector growth through a market system approach. The Activity will contribute to Development Objective 2, *Availability, Access, and Utilization of Domestically Produced and Nutritious Foods Increased*, of USAID's Country Development and Cooperation Strategy.

This Environmental Mitigation and Management Plan (EMMP) is based on the environmental determinations specified in the Initial Environmental Examination (IEE) approved by USAID (Asia 17-078, dated August 9, 2017), and to fulfill those recommendations and requirements as mentioned.

In order to ensure that the Activity has minimal negative impacts on the environment, the Project Description was critically analyzed to illustrate and visualize the anticipated interventions. Then, the potential impacts of each of the anticipated interventions were judged against the environmental guidelines, approvals, and documentation required by the United States Government (USG) and the Government of Bangladesh (GOB). The EMMP was developed based on the review of relevant documents, interviews, site visits, and practical work experience and professional judgment.

The EMMP identified a set of generic potential environmental threats that would take place as a result of the anticipated interventions below:

- a) Bio-safety might be disrupted if invasive alien fish species are introduced;
- b) Food-safety might be disrupted if harmful inputs (i.e. chemicals, pharmaceutical products) are used by the fish feed millers, hatchery operators, growers, and/or the actors in the fish value chain;
- c) Aquaculture might be extended in an environmentally sensitive area or in protected areas;
- d) As an indirect result of the anticipated interventions, use of substances like chemical fertilizers, pesticides, pharmaceutical products, etc. may increase, which can cause substantial pollution or long-term impact on wildlife populations.

In order to mitigate the potential impacts, the EMMP recommended measures to avoid/minimize the consequences for each of the respective anticipated interventions. The EMMP also developed a monitoring system to oversee if the mitigation procedures are appropriate and effective.

Finally, the Grantee and the sub-Grantees will be responsible to ensure sound execution of the EMMP.

1. INTRODUCTION

1.1 Purpose and Guiding Principles

Pursuant to the U.S. Agency for International Development (USAID) Environmental Compliance Procedures (22 CFR Part 216), *Feed the Future Bangladesh Aquaculture and Nutrition Activity* shall follow the environmental determinations specified in the Initial Environmental Examination (IEE) approved by USAID (Asia 17-078, dated August 9, 2017). As recommended in the approved IEE, the Activity will categorize all of its interventions with threshold decisions. The interventions will be implemented based on the defined threshold determination, where the Activity will mitigate potential environmental risks for the interventions that will have Negative Determination with Conditions (NDC). The Activity prepared this Environmental Mitigation and Monitoring Plan (EMMP) to fulfill those recommendations and requirements as mentioned in the approved IEE.

The objective of this EMMP is to establish criteria for eligibility, selection, and screening against potential environmental and social risks of the interventions, and to address mitigations. This document will guide Activity and sub-grantee staff members to implement and monitor the required mitigation plan for the interventions under NDC.

The EMMP will act as a guide to -

- ascertain, monitor, and report USAID about potential environmental risks due to implementing the interventions;
- prepare appropriate methodology to ensure environmental compliance including the process for completion of the Environmental Due Diligence (EDD), Environmental Review and Assessment (ERA);
- prepare a mitigation plan to address potential environmental risks;
- set up appropriate indicators to monitor the progress, effectiveness, and efficiency of the mitigation plan; and
- determine responsible parties to implement actions, ensure compliance, and reporting.

1.2 Background

The *Feed the Future Bangladesh Aquaculture and Nutrition Activity* is built on the achievements of the *Feed the Future Aquaculture for Income and Nutrition Activity (AIN)* to sustain positive aquaculture sector growth through an inclusive market system approach. This is a five-year assistance activity awarded by the USAID to the Grantee, International Center for Living Aquatic Resources Management (ICLARM), doing business as WorldFish¹ hereinafter referred to as "WorldFish", on 6 February 2018, and expected to continue until 5 February 2023 with US \$24.5 million funding.

The Activity will contribute to Development Objective 2, *Availability, Access, and Utilization of Domestically Produced and Nutritious Foods Increased*, of USAID's Country Development and Cooperation Strategy. The overarching goal of the *Feed the Future Bangladesh Aquaculture and Nutrition Activity* is to achieve inclusive aquaculture sector growth through a market system approach. This goal will be achieved by separating activities into three main purposes:

¹ WorldFish is a member of the Consultative Group for International Agricultural Research (CGIAR).

Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and *ghers*²;

Purpose 2: Strengthened aquaculture value chain; and

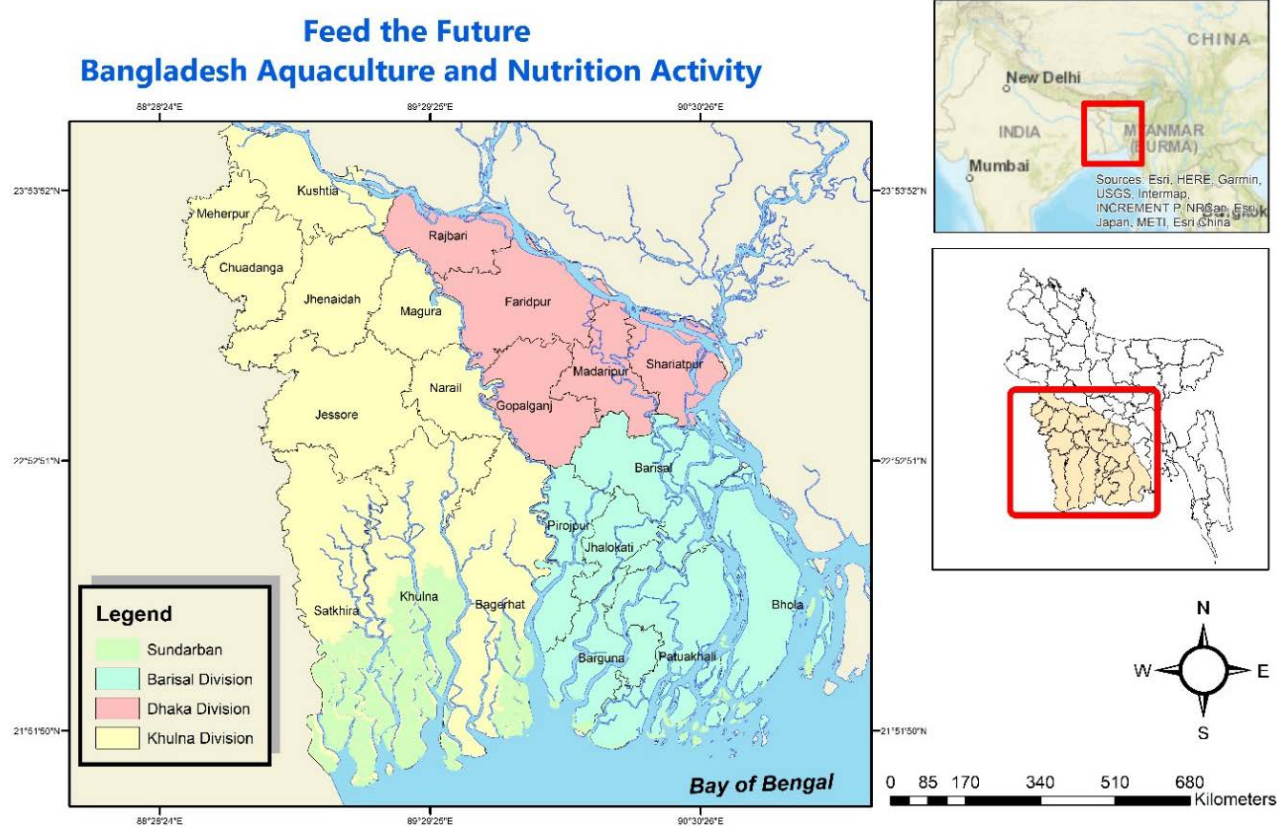
Purpose 3: Increased awareness and adoption of nutrition-related behaviors

The Activity aims to improve the sustainable livelihoods for a large number of smallholder farmers (i.e. 400,000 men, women, and youth), providing them with skills and knowledge on aquaculture to thrive in a growing market.

The Activity will stimulate aquaculture sector growth, increase employment and incomes, and food and nutritional security for rural households. It will serve a facilitating role by coordinating linkages among value chain actors in private, public, and civil society sectors. The approach involves developing the capacity of women and men private sector actors such as hatchery owners, nursery owners, fish fingerling sellers, fish feed manufacturers, feed dealers, and a broad range of supporting services so that the firms will be able to continue to develop the capacity of all value chain players even after the Activity ends.

The Activity will be implemented across the following 21 southern districts under three divisions of Bangladesh in the Feed the Future Zone of Influence (ZOI) in a phased manner:

1. Barishal Division: Barishal, Bhola, Jhalokathi, Perojpur, Barguna, and Patuakhali;
2. Dhaka Division: Faridpur, Gopalganj, Madaripur, Rajbari, and Shariatpur; and
3. Khulna Division: Jashore, Jhenaidah, Magura, Narail, Bagerhat, Khulna, Satkhira, Chuadanga, Meherpur, and Kushtia.



² *Gher* is a traditional aquatic-agricultural farming system in Bangladesh where a pond is constructed through modification of a rice field.

2. REGULATORY FRAMEWORK

2.1 Relevant Policies, Laws, and Strategies of the Government of Bangladesh

Bangladesh has a set of environmental policies, Acts, and Rules dealing with environmental protection and pollution overseen by the Department of Environment (DoE). **Table 1** shows the laws, regulations, and strategies of the Government of Bangladesh (GOB) that are relevant to the Activity.

Table 1: The GOB policies, laws, regulations and strategies relevant to the Activity

Laws and Regulations	Key Elements
Bangladesh Environmental Policy, 1992	Recent Bangladesh environmental law is based on the guiding principles stated in the Bangladesh Environmental Policy, 1992. The legal framework of this policy proposed: to amend all laws to meet present-day needs; frame new laws to control pollution and degradation; ensure implementation and raise public awareness; ratify all concerned international laws/conventions and policies, and bring national laws into line with such.
Environmental Conservation Act, 1995 (amended in 2010)	Environmental Conservation Act, 1995 (amended in 2010) is dedicated to the “ <i>conservation, improvement of quality standards, and control through mitigation of pollution of the environment.</i> ” The Environmental Conservation Rules, 1997 (amended in 2002) made in accordance with the Act provide additional guidance. They specify the ambient standards (of water, air, and sound); allowable discharge/emission levels (of water and air pollutants, and noise); categorization of the projects and industries (i.e. Green, Orange-A, Orange-B, and Red); and the environmental clearance procedure. The Environmental Conservation Act also makes provision for the protection of ecosystems – GOB can declare “Ecological Critical Area (ECA)” in any area likely to reach environmentally critical conditions, and can specify operations and processes that cannot be initiated or continued in those areas.
Environmental Court Act, 2000 (amended in 2002)	Environmental Court Act, 2000 (amended in 2002) supports Environmental Conservation Act, and the Environmental Conservation Rules by providing for the establishment of environmental courts for the trial of offenses relating to environmental pollution.
Fish Hatchery Act, 2010, and Fish Hatchery Rules, 2011	Fish Hatchery Act, 2010, and Fish Hatchery Rules, 2011 were developed to make fisheries resources management and development initiatives sustainable. They are very important to establish and maintain both bio- and food-safety. The Fish Hatchery Act imposed a registration system ³ for the hatcheries; banned hybridization, ⁴ inbreeding, and importing ⁵ live fish or spawn. The Fish Hatchery Rules specifies the categorization ⁶ of the hatcheries, and the requirements (i.e. physical facilities and technical expertise) for each of the categories; registration and approval processes; procedures for broodstock management; schedule for harmful drugs and chemicals; and sewerage and waste disposal conditions.
Fish Feed and	Fish Feed and Animal Feed Act, 2010, and Fish Feed Rules, 2011 support to

³ This is apart from having a trade license. The District Fisheries Officer (DFO) will act as the Registration Authority.

⁴ Only the Government approved fisheries research and extension centers or establishments may be allowed for hybridization in special cases.

⁵ without prior approval of the Director General of Department of Fisheries (DoF)

⁶ **Category I:** carp hatcheries; **Category II:** prawn and shrimp hatcheries; **Category III:** other indigenous species (i.e. cat fish, perch, snake head, etc.) hatcheries; **Category IV:** mono-sex tilapia hatcheries; **Category V:** ornamental fish hatcheries; and **Category VI:** aquatic animals other than fish (i.e. crocodile, amphibians, etc.) hatcheries

Laws and Regulations	Key Elements
Animal Feed Act, 2010, and Fish Feed Rules, 2011	establish and maintain food-safety. The Fish Feed and Animal Feed Act imposed a registration system ⁷ for the feed mills; directed for quality inspection; banned production of harmful and adulterated feed, especially the use of antibiotic, growth hormone, insecticides, etc.; directed for appropriate packaging system; The Fish Feed Rules specifies the categorization ⁸ ; environmental conditions for using additives, binder and ingredients; schedules for harmful chemical substances; methods for determination of standard of feed; procedure for quality control check; directed for appropriate feed preparation, storage, and sewage and waste disposal systems.
Pesticides Ordinance, 1971; Pesticides (Amendment) Act, 2009	Pesticides Ordinance, 1971; Pesticides (Amendment) Act, 2009; and the Pesticide Rules, 1985 (Amendment 2010) specify the processes for registration, importing manufacturing, formulation, packaging, and labeling. They also classified pesticides, and the environmental conditions for sales, distribution, and uses.

2.2 Relevant Policies, Laws, and Strategies of the United States Government

USAID is required, by statute, court order and executive order, to utilize an Environmental Impact Assessment (EIA) process to evaluate the potential impact of USAID's activities on the environment prior to implementation. These are all outlined and described by federal regulation 22 CFR 216; USAID fulfills these requirements through its environmental procedures. **Table 2** shows the laws, regulations, and strategies of the U.S. Government (USG) that are applicable to international development.

Table 2: U.S policies, laws, regulations and strategies relevant to the USG foreign assistance

Laws and Regulations	Key Elements
22 CFR 216	CFR 216 ("Reg. 216") is the US federal regulation defining USAID's pre-implementation EIA process. The output of this process is Reg. 216 documentation – Requests for Categorical Exclusion (RCEs), Initial Environmental Examinations (IEEs), and Environmental Assessments (EAs).
Executive Order 12114	Considers the environmental effects abroad of major federal actions. Requires that USG agencies (i.e. USAID) undertaking activities/projects in foreign countries develop procedures to, in effect, comply with the spirit of the National Environmental Policy Act (NEPA), which requires an EIA process for USG projects/activities.
Foreign Assistance Act 117	Section 117 of the Foreign Assistance Act (FAA) of 1961, as amended. Requires USAID to utilize an EIA process to evaluate the potential impact of USAID's activities on the environment prior to implementation, and to "fully take into account" environmental sustainability in designing and carrying out its development program.
Foreign Assistance Act 118	Establishes programming mandates related to tropical forests and requires that: "Each country development strategy statement or other country plan prepared by the Agency for International Development (A.I.D.) shall include an analysis of (1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified." USAID's Automated Directive Systems (ADS) 201.3.4 implements this mandate by requiring that an

⁷ The Director General of DoF and DLS or their nominated personnel will act as the registration authority for fish feed and animal feed, respectively

⁸ **Category 1:** feed producers; **Category 2:** feed importers and exporters; **Category 3:** feed traders

Laws and Regulations	Key Elements
	"environmental analysis" conforming to this requirement and that of FAA 119 (see below), be completed in Phase 1 of development of each CDCS.
Foreign Assistance Act 119	Establishes programming mandates related to biodiversity and requires that: <i>"Each country development strategy statement or other country plan prepared by the A.I.D. shall include an analysis of (1) the actions necessary in that country to conserve biological diversity, and (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified."</i> ADS 201.3.4 implements this mandate by requiring that an "environmental analysis" conforming to this requirement and that of FAA 118 (see above), be completed in Phase 1 of development of each CDCS.
Executive Order 13099	Describes the policy framework and major principles of Coral Reef Protection.
Executive Order 13112	Describes policies and procedures related to addressing Invasive Species issues.
Executive Order 13158	Describes the policy framework and major principles for managing Marine Protected Areas (MPAs)

Adapted from the Global Environmental Management Support
 webpage <http://www.usaidgems.org/lawsRegsPolicies/execOrder.htm>

2.3 USAID Environmental Regulations and Requirements

22 CFR 216 is the U.S. Federal Regulation defining USAID's pre-implementation EIA process. The output of this process is documenting RCEs, IEEs, and EAs. Other related mandatory provisions are mentioned in ADS – especially, but not limited to ADS 201 and 204.

Within this framework, it is USAID's environmental policy to:

- Ensure that the environmental consequences of A.I.D. financed activities are identified, and considered by A.I.D. and the host country prior to a final decision to proceed and that appropriate environmental safeguards are adopted;
- Assist developing countries to strengthen their capability to appreciate and effectively evaluate the potential environmental effects of proposed development strategies and projects, and to select, implement and manage effective environmental programs;
- Identify impacts resulting from A.I.D.'s actions on the environment, including those aspects of the biosphere which are the common and cultural heritage of all mankind; and
- Define environmental limiting factors that constrain development and identify and carry out activities that assist in restoring the renewable resource base on which sustained development depends.

2.3.1 Initial Environmental Examination (IEE)

Background and Purpose:

An IEE is the first review of the reasonably foreseeable effects of a proposed action on the environment. Its function is to provide a brief statement of the factual basis for a Threshold Decision as to whether an EA or an Environmental Impact Statement (EIS) will be required for project activities within the framework of the program. No project activity financed by USAID can be implemented unless an environmental threshold determination has been reached for that project activity.

Pursuant to the USAID Environmental Compliance Procedures (22 CFR Part 216), the Activity shall follow the environmental determinations specified in the IEE approved by USAID (Asia 17-078, dated August 9, 2017).

Requirements:

Except as provided in '216.2(b), environmental compliance procedures apply to all new projects, programs or activities authorized or approved by A.I.D. and to substantive amendments or extensions of ongoing projects, programs, or activities.

The recipient of the grant must propose mitigation measures to prevent this potential harm to the environment.

There are two exceptions:

- Activities carried out in an emergency or that have exceptional foreign policy sensitivities are *exempt*.
- Activities that, by their nature, are unlikely to have a negative impact on the environment qualify for a *Categorical Exclusion (CE)*. (A program with only categorically excluded activities will not have to carry-out an IEE but will have to submit a *CE Facesheet* with the relevant Reg. 216 sections cited.)

All other programs must prepare an IEE and request the relevant category/categories or *Threshold Decision(s)* along with justification in a narrative report. USAID has determined four possible categories (*Threshold Decisions*) resulting from the IEE:

- *Negative Determination (ND)*: No anticipated adverse impact on the environment.
- *Negative Determination with Conditions (NDC)*: Possible adverse impact but measures will be taken to guard against it.
- *Positive Determination (PD)*: Likely adverse impact.
- *Deferral*: Not enough is known about the Activity to make a determination of environmental impact.

Environmental Threshold Decision:

Environmental Threshold Decision is a formal Agency decision which determines, based on the IEE, whether a proposed Agency action is a major action significantly affecting the environment. The activities, recommended *Threshold Decisions* and required Reg. 216 actions are given below in **Table-3** (ref: Approved IEE - Asia 17-078, dated August 9, 2017, page 27).

Table 3: Recommended Threshold Decisions and required Reg.216 actions

Sl. #	Activities/Interventions	Effect on Natural or Physical Environment	Threshold Decisions and Reg. 216 actions
I	<p>All program activities expected to have no effect on the natural or physical environment</p> <p>This includes education, technical assistance, training activities except to the extent such activities include actions directly affecting the environment (such as construction, demo of pesticide use, advisory services on pesticides during trainings and policy development support, etc.), consultations, participant training, orientation, document transfers and information dissemination, analysis, studies, conferences, workshops, study tours, curriculum development, developing information networks.</p>	No effect	<p>Categorical Exclusion (CE)</p> <p>No action required.</p> <p>If in doubt whether the activity falls under the CE, the Grantee shall consult the Mission Environment Officer (MEO)</p>
II	<p>All activities where no significant adverse effects are expected</p>	Insignificant	<p>Negative Determination (ND)</p> <p>It is required to ensure that</p>

Sl. #	Activities/Interventions	Effect on Natural or Physical Environment	Threshold Decisions and Reg. 216 actions
	<p>No special mitigation measures are needed; activities are implemented with conditions that normal good practices, engineering methods and standard instructions are followed.</p> <p>This includes procurement of office furniture, electric and electronic equipment and materials (no bio-hazardous or low-radiological materials will be used for testing in this equipment)</p>		<p>equipment, commodities (also see ADS 312) and materials are procured from certified retailers; environmental safety and quality certificates conforming with national and/or international environmental conditions are available; equipment and materials are used in an environmentally sound and safe manner, properly disposed of, when applicable, at the end of their useful life in a manner consistent with GOB legislation, and in their absence with best management practices according to USG, European Union or equivalent environmental conditions acceptable to USAID.</p>
III	<p>Activities that normally do not have a significant effect on the environment if special mitigation measures are specified to prevent unintended impact</p> <p>The activities in this category might include: adaptive trials to test and refine new seed varieties, feed, or management procedure; multiplication and dissemination of improved seeds; introduce and intensify improved fish farming technology and management practices; introduction of new high yield varieties for adaptive trials; multiplication and dissemination of improved seed and pest resistant varieties; link input wholesalers with adaptive research activities and help them commercialize tested and approved quality inputs and practices for large-scale adoption on a commercial basis; small-scale construction/rehabilitation.</p>	Minor to moderate effect	<p>Negative Determination with Conditions (NDC)</p> <p>EDD in form of Environmental Review and Assessment Checklist (ER Checklist) is required to identify environmental effects, and develop EMMP when applicable. If significant adverse effects are expected, a Scoping Statement (SS) and EA (including PERSUAP) shall be conducted by the implementer prior to the start of activities. Scope of Work (SOW)/Terms of Reference (TOR) for SS and EA Report (including PERSUAP if applicable) must be reviewed by MEO and approved by Asia BEO.</p>
IV	<p>Activities that normally have significant effect on the natural and/or physical environment</p> <p>The activities in this category might include: programs of river basin development; irrigation or water management projects, including dams and impoundments; agricultural land leveling; drainage projects; large-scale agricultural mechanization; new lands development; resettlement projects; penetration road building or road improvement projects; power plants; industrial plants; potable water and sewerage projects other than those that are small-scale</p>	Significant effect	<p>Positive Determination (PD)</p> <p>IEE, EA or EIA, as appropriate, will be conducted by the implementer prior to the start of activities. SOW/TOR for IEE, EA and EIA Report must be reviewed by MEO and approved by Asia BEO.</p>

Environmental Determinations and Climate Risk Rating:

The 2017 Umbrella IEE, Asia 17-078, for the Activity identified that the interventions as “technical assistance (TA)” in nature, and therefore, will impart no negative impact on the physical or natural environment. Most of the TA activities qualify for a *CE*. The activities that include actions with potential negative impact on environment or the activities that do not fall under the *CE* per 22 CFR 216.2.c, the mitigation measures specified in the USAID IEE (i.e. IEE Asia 17-078, and Memorandum to File (MTF) for the *Feed the Future Bangladesh Aquaculture and Nutrition Activity*, MTF2 for Asia 14-19) shall be followed. WorldFish, the Grantee, will check if any of the actions of the Activity will be classed as *NDC*.

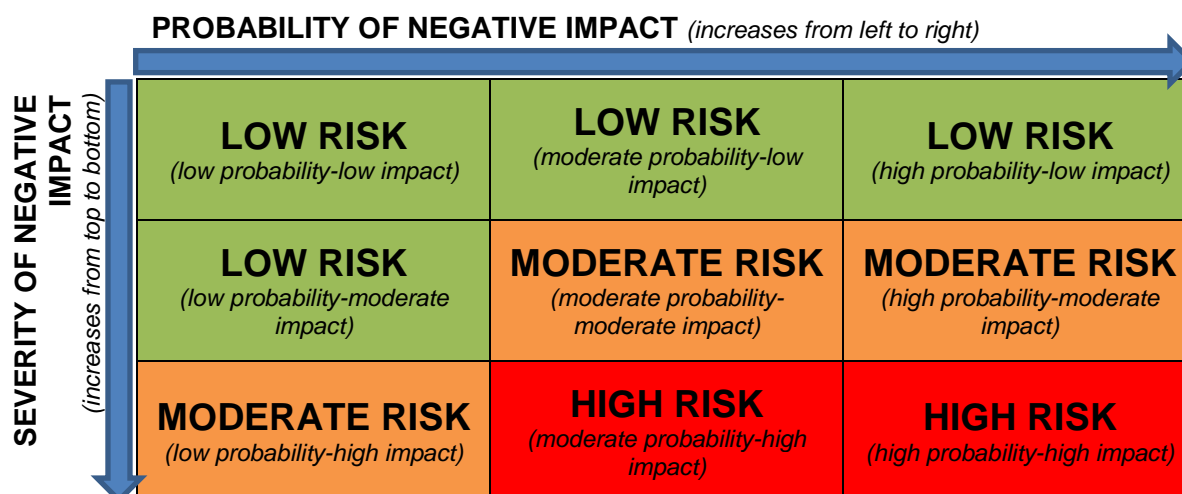
For any changes in the scope and nature of the activities or new activities, which may cause potential significant adverse environmental and social impacts, WorldFish shall immediately notify the USAID Agreement Officer’s Representative (AOR), who in turn shall notify the USAID/Bangladesh MEO.

The current IEE Asia 17-078 will expire in September 2022, prior to the end date of this agreement. Therefore, to confirm the mandatory environmental compliance coverage for the remaining period of this activity, the recipient and AOR must ensure the MEO and BEO approval, as appropriate, of the amendment of IEE prior to the end date of the existing IEE. As per 22 CFR 216, no activity will be implemented without approved Reg. 216 environmental documentation.

The Activity uses a Market Systems Approach where most of the interventions will be implemented by private-sector and NGO partners as sub-grantees who respond to calls for proposals. This makes it impossible to define the interventions at this stage. However, **Table 4** shows the most likely interventions that the Activity will support. These are listed, categorized, analyzed for potential impacts based on context and professional judgment.

The adverse impacts of climate change (CC) threaten to roll back decades of progress in reducing poverty and improving economic growth and therefore, climate risk management (CRM) has become a priority for all USG projects and activities. The *Climate Risk Management for USAID Projects and Activities: A Mandatory Reference for ADS Chapter 201*⁹ specifies the process of assessing, addressing, and adaptively managing climate risks. Quantitatively assessing climate risk is difficult. *ADS Chapter 201* suggests to use the following matrix to facilitate technical judgement to qualitatively categorize climate risks to the project or activity outcomes as **low**, **moderate**, or **high**:

⁹ https://www.usaid.gov/sites/default/files/documents/1868/201mal_042817.pdf



In order to ensure effectiveness and sustainability of activity objectives in the face of climate variability and change, the *Climate Risk Screening and Management Tool*¹⁰ guides the detailed step-by-step process of assessing and addressing climate-related risks.

Furthermore, the Tool describes the assigned climate risk ratings as follows:

- a) **Low (L)** climate risk indicates CC is unlikely to materially impact achievement or sustainability of activity outcomes (i.e. the potential consequences of higher temperatures on a governance initiative focused on policy reform);
- b) **Moderate (M)** climate risk indicates CC may materially impact achievement or sustainability of activity outcomes (i.e. the potential consequences of increasing sea surface temperature, causing coral reef bleaching and subsequent reduction in coral reef fish populations, on a coastal ecotourism project); and
- c) **High (H)** climate risk indicates CC is likely or highly likely to materially impact achievement or sustainability of activity outcomes (i.e. the potential consequences of sea level rise and frequent storm surges to a coastal settlement plan).

As specified in the Tool, the following questions were reviewed for each of the anticipated interventions in order to determine the Climate Risk Ratings:

- a) How has the intervention (or a similar one) been impacted by CC in the past few decades? How severe were those impacts? Were any populations disproportionately impacted?
- b) Given projections of future CC, how might the task or intervention be affected? How severe might those impacts be?
- c) How might climate and non-climate stressors interact to exacerbate climate risks?

However, according to the Tool, no additional action to address the *low climate risk* is required. The *moderate to high climate risks* must be addressed based on technical judgements and integrated into the activity design and/or implementation. Consideration of trade-offs and how USAID can best promote resilient development should inform the decision. In some cases, decisions could be made to accept one or more of those climate risks that will not be addressed explicitly by risk management options during activity design and implementation.

¹⁰ <https://www.climatelinks.org/sites/default/files/2017-03-21%20USAID%20CRM%20Project%20Tool.pdf>

Table 4: Summary of the Recommended IEE Threshold Decisions and Climate Risk Ratings for the anticipated interventions.

ANTICIPATED INTERVENTIONS	Threshold Decision				Climate Risk Rating		
	CE ¹	ND ²	NDC ³	PD ⁴	L	M	H
Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and ghers							
Sub-Purpose 1.1: Increased availability of improved fish seed							
(1.1.1) Assist DoF/BFRI/universities to conduct BMP trainings for hatchery operators	x				x		
(1.1.2) Assist hatcheries and nurseries in quality seed production			x				x
(1.1.3) Assist hatcheries in developing branding to promote quality seeds	x				x		
(1.1.4) Facilitate using solar power at hatcheries		x			x		
(1.1.5) Promote water-recirculation systems at hatcheries		x			x		
(1.1.6) Facilitate improved seed transportation systems		x			x		
(1.1.7) Assist hatcheries/local service providers (LSPs) in conducting farmers' trainings	x				x		
(1.1.8) Assist hatcheries/local service providers (LSPs) in conducting demonstration trials for their product promotion			x			x	
(1.1.9) Facilitate DoF/business associations in monitoring bio-safety issues, certification of quality, and issuing/renewing registration to the hatcheries	x				x		
Sub-Purpose 1.2: Increased availability of affordable quality feed							
(1.2.1) Assist DoF/BFRI/universities to conduct best management practice (BMP) trainings for feed millers & dealers	x				x		
(1.2.2) Assist feed millers in quality feed production			x		x		
(1.2.3) Assist feed millers in upgrading machinery and equipment		x			x		
(1.2.4) Facilitate to upgrade storage system for feeds		x			x		
(1.2.5) Assist feed millers in developing branding to promote quality feeds	x				x		
(1.2.6) Assist feed millers/LSPs in conducting farmers' trainings on fish nutrition	x				x		
(1.2.7) Assist feed millers/LSPs in setting demonstrations trials for their product promotion			x			x	
(1.2.8) Assist professional associations (i.e. Soybean Association of Bangladesh)/ millers/LSPs to accelerate production of major feed ingredients (i.e. increase soybean/maize production through contact farmers; trash-fish drying)			x			x	
(1.2.9) Assist government institutions including universities in developing facilities for quality testing of ingredients and feeds			x		x		
(1.2.10) Assist DoF in monitoring feed- and food-safety issues, certification of quality, and issuing/renewing registration to the feed millers and dealers	x				x		
Sub-Purpose 1.3: Increased adoption of improved pond management practices							
(1.3.1) Assist Information and Communication Technology (ICT) service providing organizations in developing aquaculture-ICT	x				x		
(1.3.2) Assist LSPs/ICT service-providing organizations in utilizing/operating the developed aquaculture-ICT to aggregate individual fish growers' orders for different inputs including seed and feed in order to optimize pricing, quality,	x				x		

ANTICIPATED INTERVENTIONS	Threshold Decision				Climate Risk Rating		
	CE ¹	ND ²	NDC ³	PD ⁴	L	M	H
<i>and timely delivery</i>							
(1.3.3) Assist government institutions, universities, consultants, etc. in developing facilities for providing “fish-vet” services			X		X		
(1.3.4) Assist LSPs in organizing fish-health camps by bringing resource persons from DoF, universities, successful farmers, etc.			X		X		
(1.3.5) Assist LSPs, feed millers, and hatchery operators in organizing Farmers’ Field Days, audio-visual document presentations, and other communication means	X				X		
(1.3.6) Assist institutions in testing/conducting demonstration innovative aquaculture systems e.g. in-pond raceway			X			X	
(1.3.7) Assist LSPs in conducting aquaculture-mechanization demonstration (i.e. automated feeding, aeration, solar power)		X			X		
Purpose 2: Strengthened aquaculture value chain							
Sub-Purpose 2.1: Increased market linkages							
(2.1.1) Assist vocational training institutions to train youths on repair and maintenance of the tools, machinery, and equipment involved in aquaculture, feed mill, hatchery, post-harvest handling, processing, transportation, etc.	X				X		
(2.1.2) Assist LSPs/market actors in updating the aquaculture-ICT system with fish market information	X				X		
(2.1.3) Assist universities/BFRI/DoF to train actors in the fish supply chain on post-harvest handling, value-added processing and quality control	X				X		
(2.1.4) Assist market actors in developing innovative post-harvest handling and transportation systems			X		X		
(2.1.5) Assist LSPs/market actors in developing new fish products, improving the existing ones, packaging, and branding			X		X		
Sub-Purpose 2.2: Increased engagement of private sector in aquaculture markets							
(2.2.1) Assist financial institutions (FIs) in developing and promote appropriate financial products to foster aquaculture business	X				X		
(2.2.2) Assist business organizations (i.e. chain shops) for generic promotion of farmed fish	X				X		
(2.2.3) Assist ICT service-providing organizations in accumulating and collating information on aquaculture-related business opportunities	X				X		
Sub-Purpose 2.3: Improved enabling environment for inclusive growth in aquaculture							
(2.3.1) Assist relevant business associations and policy-focused NGOs in pursuing for (re)forming policy, strategy, act, and rule as required	X				X		
(2.3.2) Assist universities, research institutions, and consultants in conducting aquaculture-related research and publication			X			X	
(2.3.3) Assist ICT service-providing organizations in accumulating and collating information to foster aquaculture-related business	X				X		
Purpose 3: Increased awareness & adoption of nutritional related behaviors							
(3.1) Assist universities, research institutions, and consultants in conducting fish-based nutrition-related research and			X		X		

ANTICIPATED INTERVENTIONS	Threshold Decision				Climate Risk Rating		
	CE ¹	ND ²	NDC ³	PD ⁴	L	M	H
<i>publication</i>							
(3.2) Assist business organizations in developing and marketing fish-based nutrition-sensitive food products			X		X		
(3.3) Engage electronic and print media for promotion of diverse and nutritious diets	X				X		
(3.4) Assist ICT service-providing organizations in accumulating and collating information to promote diverse and nutritious diets	X				X		
(3.5) Assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.			X			X	

¹ CE: after '216.2(c)(2);

² ND: after '216.3;

³ NDC: after '216.3 and/or '216.2(e);

⁴ PD: after '216.2(d)(1)

2.3.2 Environmental Due Diligence (EDD)

The IEE outlines the interventions with the potential for negative environmental impacts and specifies actions to minimize the risk of these activities. To comply with IEE recommendations, the Activity conducted EDD for each of the anticipated interventions categorized as NDC to document existing environmental concerns and foreseeable environmental effects resulting from the Activity. The EDD contains an Environmental Review and Assessment Checklist (ER Checklist) and a Leopold Matrix.

2.3.3 Environmental Mitigation and Monitoring Plan (EMMP)

An EMMP is required to define the mitigation measures by identifying the means taken in order to avoid, reduce, and/or compensate for expected environmental impacts, and actions to be taken to monitor if the mitigation measures are effective and how they accomplish their intended result. As part of the monitoring process, the EMMP will identify who will undertake the mitigation and who will conduct the monitoring, and at what frequency. Implementation of an EMMP will also require expenditures, which the implementer will cover.

3. ENVIRONMENTAL SCREENING ACTIVITIES

3.1. Potential Environmental Impacts

In general, it is anticipated that the anticipated activities will not present any significant adverse environmental effects, provided that the mitigation and monitoring activities recommended in the IEE are carried out. A discussion of potential environmental impacts for each activity is presented below.

Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and ghers

Sub-Purpose 1.1: Increased availability of improved fish seed

(1.1.1) Assist DoF/BFRI/universities to conduct BMP trainings for hatchery operators:

The Activity will assist DoF/BFRI/universities to train hatchery operators in maintaining the purity of parent stocks; improving storage system of feed, pharmaceutical products, and other inputs; techniques for use of appropriate doses of pharmaceutical products; techniques for water-recirculation systems; techniques for cleaning and disinfecting hatchery apparatus/units/tanks in minimizing impact on environment; etc. The prime objective of the aforesaid trainings is to assist the fish hatchery operators to avoid and/or minimize the impact on the environment, and to ensure bio-, and hence food-safety issues in their day-to-day operations. Aforesaid trainings would not have any direct impact on the environment.

(1.1.2) Assist hatcheries and nurseries in quality seed production:

Hatcheries will be assisted to maintain the purity of broodstock, avoiding seed adulteration/inbreeding, etc. Both hatcheries and nurseries will be assisted to maintain bio- and food-safety regulations. The interventions might have some significant impacts on the environment and human health, and cause bio- and food-safety issues if invasive alien fish species are introduced, seed adulteration takes place, and/or harmful inputs (i.e. chemicals, pharmaceutical products) are used in the hatcheries and nurseries.

(1.1.3) Assist hatcheries in developing branding to promote quality seed:

Hatcheries will be assisted to define how they want to be perceived when the nursery farmers and fish growers would use their products; organize their businesses based on branding; communicate their branding to users; and, to be consistent. The steps of the intervention would not cause any environmental impact.

(1.1.4) Facilitate using solar power at hatcheries:

Hatcheries need to use generator(s) when (and where) electricity supply is not available. Using a generator not only increases cost but also creates air and sound pollution. As part of avoiding/ mitigating carbon emission, hatcheries will be assisted to install renewable energy systems and operate on renewable energy. The intervention would have no significant adverse effects on the environment if the equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner.

(1.1.5) Promote water filtration and recirculation systems at hatcheries:

Quality water is not prevalent in hatchery operation, especially during the pre-monsoon period. The quality of groundwater at the ZOI is not always suitable either. Therefore, hatcheries have to depend on surface water that is stored in rain-fed ponds (i.e. brood-stock ponds). In order to make (quality) water available, hatcheries first pump water from such rain-fed ponds (or other sources) to an overhead reservoir, then water passes through an

elevated structure, called an “oxygen tower” to all the units (i.e. brood-stock tanks, hatching “bottles,” fry-rearing tanks, delivery tanks). The oxygen-tower contains several perforated-shelves so that water can get more opportunity to have more interaction with air to become rich in dissolved oxygen. In order to prevent disease infestation, all the units in a hatchery require a continuous flow of dissolved-oxygen rich water, and the water flow is maintained using gravity. Water from the outlets of all units is accumulated in a drain, which channels waste-water either to a pond or a discharge canal. Since the waste-water could have some potential impact on the environment and human health, therefore, it needs to be treated prior to release it to nature.

In order to maintain better hatching and survival rates, hatcheries need to arrange quality water, which would be suitable in terms of physical, chemical, and biological properties. Hatcheries can resolve the constraints of both water shortage and its quality by installing a water re-circulatory system including a bio-filter. The treated-water is pumped again into the overhead reservoir. This process will not have any significant adverse effect on the environment if the equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner.

(1.1.6) Facilitate improved seed transportation systems:

Fish fry are transported in polythene bags with oxygenated-water from hatcheries to nurseries. Fish fingerlings are transported from nursery ponds to farmers’/grow-out ponds in containers with water, in which oxygen is added by splashing water. Fingerlings are also transported in polybags with oxygenated-water which involves more cost and generates waste. The intervention would have significant adverse effects on the environment if only polybags are used and not reused.

(1.1.7) Assist hatcheries/LSPs in conducting farmers’ trainings:

The Activity will assist hatcheries/LSPs to train farmers on innovative cultivation methods/management process. Aforesaid trainings would not have any direct impact on the environment.

(1.1.8) Assist hatcheries/LSPs in conducting demonstration trials for their product promotion:

In order to popularize certain species, to introduce innovative cultivation method/management process, and/or to promote their products, hatcheries/LSPs may require to set up demonstration trials. The interventions might have some significant impacts on the environment if inappropriate fish species and inputs (i.e. feeds, pharmaceutical products) are promoted, or are extended to environmentally sensitive areas.

(1.1.9) Facilitate DoF/business associations in monitoring bio-safety issues, certification of quality and issuing/renewing registration to the hatcheries:

The Activity will facilitate the process of identifying and monitoring the bio- and food safety issues; monitor hatcheries in maintaining the purity of broodstocks; and issuing/renewing registration to the hatcheries based on their monitoring results. This facilitation process will take place with DoF and relevant business organizations. These interventions would not cause any environmental impact.

Sub-Purpose 1.2: Increased availability of affordable quality feed

(1.2.1) Assist DoF/BFRI/universities to conduct BMP trainings for feed millers and dealers:

The Activity will assist DoF/BFRI/universities to train feed millers on quality testing of ingredients and processed feeds; techniques to store raw materials and the finished products; techniques for feed formulation and processing for optimizing quality and price; techniques for cleaning equipment and machinery used by millers to minimize impact on environment; etc. The prime objective of the aforesaid trainings is to assist the fish feed millers (and also dealers) to avoid and/or minimize the impact on the environment, and to

ensure feed-, and hence food-safety issues in their day-to-day operations. Aforesaid trainings would not cause any environmental impact.

(1.2.2) Assist feed millers in quality feed production:

Feed millers will be assisted in maintaining quality of ingredients, avoiding feed adulteration, etc. Both feed millers and dealers will be assisted in maintaining feed- and food-safety regulations. The interventions might have some significant impacts on the environment, fish-health, and food-safety might be disrupted if feed adulteration takes place, and/or appropriate waste management/pollution is not controlled.

(1.2.3) Assist feed millers in upgrading machinery and equipment:

In order to increase efficiency, optimize quality and price, avoid/minimize pollution, feed millers will be assisted to upgrade machinery and equipment. The intervention would have no significant adverse effects on the environment if the equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner.

(1.2.4) Facilitate upgrading of storage systems for both raw materials and feeds:

Proper storage systems can help in to maintain quality and increase the shelf-life of perishable goods. Feed millers and dealers will be assisted in installing adequate storage facilities, and labeling and storing processed feeds in order to maintain feed- and food-safety regulations. The intervention might have some impacts on the environment, fish-health, and hence human-health if not stored in an appropriate way, and not delivered within an appropriate period.

(1.2.5) Assist feed millers to develop branding to promote quality feeds:

Feed millers will be assisted to define how they want to be perceived when the nursery farmers and fish growers would use their products; organize their business based on their promise; communicate their promise to the users; and, remain to be consistent. The steps of the intervention would not cause any environmental impact.

(1.2.6) Assist feed millers/LSPs to conduct farmers' trainings on fish nutrition:

The Activity will assist millers/LSPs to train farmers on fish nutrition that would not have any direct impact on the environment.

(1.2.7) Assist feed millers/LSPs to set up demonstration trials for their product promotion:

In order to promote their products, millers/dealers/LSPs may require to set demonstration trials. The interventions might have some significant impacts on the environment, fish-health, and hence human-health if the poor quality of feed is used and/or is extended to environmentally sensitive areas. The interventions might have some significant impacts on the environment, fish-health, and hence human-health if poor quality feed and inappropriate fish species and inputs (i.e. feeds, pharmaceutical products) are promoted or is extended to environmentally sensitive areas.

(1.2.8) Assist professional associations (i.e. Soybean Association of Bangladesh)/millers/LSPs to accelerate production of major feed ingredients (i.e. increase soybean/maize production through contact farmers; trash-fish drying):

The Bangladesh feed industry is heavily dependent upon imported feed ingredients, particularly fish meal, maize, and soybeans, hence feed prices are very sensitive to price and quality fluctuations. In order to accelerate production of those major ingredients, professional associations, feed millers, LSPs, etc. will be assisted to accelerate and maximize production through contact farmers/growers. The interventions might have some significant impacts on the environment if inappropriate inputs (i.e. chemical fertilizers, insecticides) are used, or is extended to environmentally sensitive areas.

(1.2.9) Assist government institutions including universities in developing facilities for quality testing of ingredients and feeds:

The Activity will assist a discernible shift in the feed market from price/quantity alone to quality and customer service. In order to facilitate the process, the Activity will assist government institutions in developing quality testing facilities, and provide services to the actors in the feed supply chain in procuring quality ingredients and feeds. The institution will also do periodic monitoring of the quality of feeds and will share the results with interested actors in the feed market and DoF. The interventions might have some impacts on the environment and human health if appropriate waste management is not applied.

(1.2.10) Assist DoF to monitor feed- and food-safety issues, certification of quality, and issuing/renewing registration to the feed millers and dealers:

Utilization of quality feeds is one of the prime elements of promoting food-safety issues in aquaculture sub-sector. DoF will be assisted in monitoring the quality of feed ingredients and processed feeds, and issuing/renewing registration to the hatcheries based on the monitoring results. The steps of the interventions would not cause any environmental impact.

Sub-Purpose 1.3: Increased adoption of improved pond management practices

(1.3.1) Assist ICT service-provider organizations to develop aquaculture-ICT:

In order to synchronize aquaculture promotion initiatives along with the backward- and forward-linkages, the Activity will assist ICT service providing organizations to develop and operate ICT services. The steps of the interventions would not cause any environmental impact.

(1.3.2) Assist LSPs/ICT service-provider organizations to utilize/operate aquaculture-ICT to aggregate individual fish growers' orders for different inputs including seed and feed in order to optimize pricing, quality, and timely delivery:

The steps of the interventions would not cause any environmental impact.

(1.3.3) Assist government institutions, universities, LSPs, to develop facilities for providing "fish-vet" services:

In order to maximize aquaculture production, government institutions/universities/consultants will be assisted in developing consulting service system (like fish-vet) in resolving farmers' constraints viz. poor fish grow, disease, water quality management, etc. The interventions might have some significant impacts on the environment, fish-health, and hence human-health if aquaculture is extended to environmentally sensitive areas, or used harmful chemicals and pharmaceutical products.

(1.3.4) Assist LSPs to organize "fish-health camps" by bringing resource persons from DoF, universities, successful farmers, etc.:

The interventions might have some significant impacts on the environment if aquaculture is extended to environmentally sensitive areas, or used harmful chemicals and pharmaceutical products.

(1.3.5) Assist LSPs, feed millers and hatchery operators to organize Farmers' Field Days, audio-visual documentation presentations, and other communication means:

The interventions might have some significant impacts on the environment if aquaculture is extended to environmentally sensitive areas.

(1.3.6) Assist institutions to test/conduct demonstration of innovative aquaculture systems e.g. in-pond raceway:

"In-pond raceway aquaculture system" is an innovative technique in which fish production could be double or even more. The Activity will assist institutions in piloting in-pond raceway aquaculture system and other innovative systems. The interventions might have some significant impacts on the environment if aquaculture is extended to environmentally

sensitive areas, or used inappropriate fish species, harmful inputs (i.e. chemicals and pharmaceutical products).

(1.3.7) Assist LSPs to conduct aquaculture-mechanization demonstration (i.e. automated feeding, aeration, solar power):

In order to increase efficiency, optimize prices, avoid/minimize waste, LSPs will be assisted in conducting aquaculture-mechanization demonstrations. The intervention would have no significant adverse effects on the environment if the equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner.

Purpose 2: Strengthened aquaculture value chain

Sub-Purpose 2.1: Increased market linkages

(2.1.1) Assist vocational training institutions to train youths on repair and maintenance of tools, machinery, and equipment involved in aquaculture, feed mill, hatchery, post-harvest handling, processing, transportation, etc.:

In order to facilitate aquaculture mechanization, production of inputs, and development of fish value chain, the Activity will assist vocational training institutions to train youth in respective trades. Aforesaid trainings would not cause any environmental impact.

(2.1.2) Assist LSPs/market actors to update the aquaculture-ICT system with fish market information:

In order to synchronize aquaculture promotion initiatives along with the forward-linkages, the Activity will assist ICT service providing organizations to develop and operate ICT services. The steps of the interventions would not cause any environmental impact.

(2.1.3) Assist universities/BFRI/DoF to train actors in the fish supply chain on post-harvest handling, value-added processing, and quality control:

In order to introduce innovative techniques to maintain the quality of fish/fish-products, the Activity will assist government institutions including DoF, BFRI, and universities in conducting training for the respective actors in the fish value chain. The interventions would not cause any environmental impact.

(2.1.4) Assist market actors to develop innovative post-harvest handling and transportation systems:

In order to maintain quality, and avoiding health hazards (i.e. avoid adding formalin), market actors will be assisted in modernization and introducing innovative techniques (i.e. battery-supported aeration for live fish transportation) in post-harvest handling and transportation. The interventions might have some impacts on the environment and human health if hazardous inputs are used, and not adopted appropriate waste management procedure.

(2.1.5) Assist LSPs/market actors to develop new fish products, improving existing ones, packaging and branding:

In order to maintain quality, and avoiding health hazards, fish value chain actors will be assisted in modernization and introducing innovative techniques in developing new fish products, and improving the existing ones. The interventions might have some impacts on the environment and human health if used hazardous inputs, and not adopted appropriate waste management procedure.

Sub-Purpose 2.2: Increased engagement of private sector in aquaculture markets

(2.2.1) Assist financial institutions (FIs) in developing and promoting appropriate financial products to foster aquaculture business:

FIs will be assisted to define how they want to be perceived when the fish growers, LSPs, inputs manufacturers and traders, and actors in fish value chain would use their products;

organize their business based on their promise; communicate their promise to the borrowers; and, to be consistent. The steps of the intervention would not cause any environmental impact.

(2.2.2) Assist business organizations for the generic promotion of farmed fish:

In order to assist sound marketing of farmed fish, chain shops and other business organizations in promoting farmed fish through mass communication (including television talk shows). The steps of the intervention would not cause any environmental impact.

(2.2.3) Assist ICT service-providing organizations in accumulating and collating information on aquaculture-related business opportunities:

In order to synchronize aquaculture promotion initiatives along with the forward-linkages, the Activity will assist ICT service providing organizations to develop and operate ICT services. The steps of the interventions would not cause any environmental impact.

Sub-Purpose 2.3: Improved enabling environment for inclusive growth in aquaculture

(2.3.1) Assist relevant business associations and policy-focused NGOs in pursuing (re)forming policy, strategy, act, and rule as required:

In order to foster aquaculture and promote farmed fish, the Activity will assist relevant business associations and policy-focused NGOs in pursuing for (re)forming policy, strategy, act, and rule as required. The steps of the interventions would not cause any environmental impact.

(2.3.2) Assist universities, research institutions, and consultants to conduct aquaculture-related research and publication:

In order to meet the ever growing demand for fish as a major source of protein, the Activity will assist universities, research institutions, and consultants in conducting research to maximize aquaculture production. The interventions might have some significant impacts on the environment if aquaculture is extended to environmentally sensitive areas, and used inappropriate inputs.

(2.3.3) Assist ICT service-providing organizations to accumulate and collate information to foster aquaculture-related business:

In order to synchronize aquaculture promotion initiatives along with the forward-linkages, the Activity will assist ICT service providing organizations to develop and operate ICT services. The steps of the interventions would not cause any environmental impact.

Purpose 3: Increased awareness and adoption of nutritional related behaviors

(3.1) Assist universities, research institutions, and consultants to conduct fish-based nutrition-related research and publication:

In order to promote fish-based nutritious food, the Activity will assist universities, research institutions, and consultants in conducting research to introduce new products, and improve the existing ones. The interventions might have some impacts on the environment and human health if appropriate waste management is not adopted.

(3.2) Assist business organizations to develop and market fish-based nutrition-sensitive food products:

In order to promote fish-based nutritious food, the Activity will assist business organizations to introduce new products, and improve the existing ones. The interventions might have some impacts on the environment and human health if hazardous inputs (including additives) are used and/or appropriate waste management is not adopted.

(3.3) Engage electronic and print media for promotion of diverse and nutritious diets:

In order to assist the sound promotion of diverse and nutritious diets, electronic and print media will be engaged in mass communication (including television talk shows). The steps of the intervention would not cause any environmental impact.

(3.4) Assist ICT service-providing organizations to accumulate and collate information to promote diverse and nutritious diets:

In order to promote diverse and nutritious diets, the Activity will assist ICT service providing organizations to develop and operate ICT services. The steps of the interventions would not cause any environmental impact.

(3.5) Assist LSPs, universities, research institutions, and consultants to conduct demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.:

In order to make available of diverse food items at the household level, the Activity will assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps. The interventions might have some significant impacts on the environment if inappropriate inputs (i.e. chemical fertilizers, insecticides) are used or is extended to environmentally sensitive areas.

3.2. Environmental Impact Mitigation Measures

Mitigation measures have been thoughtfully considered and developed for activities with foreseen environmental effects. Mitigation measures are outlined in Annex 1: EMMP Summary Table. Monitoring recommendations have been set at a level that will capture sufficient information to evaluate the success of the Activity to mitigate adverse effects upon the environment while at the same time not overburdening the Activity's staff with excessive monitoring duties nor causing the undue expenditure of project funds.

Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and gher.

Sub-Purpose 1.1: Increased availability of improved fish seed.

(1.1.2) Assist hatcheries and nurseries in quality seed production:

The Activity will develop a list of approved fish species to be hatched and grown. The Activity will assist DoF and hatcheries/nurseries to comply with Fish Hatchery Rules, 2011 in order to avoid seed adulteration, and ensure using only the appropriate inputs (i.e. drugs, chemicals, pharmaceutical products) as specified in the Rules, and as approved by USFDA (i.e. 21 CFR 522-1081, 529-2503, 558-450, 556-640, etc.) are used. The Activity will also assist hatcheries in labeling and storing feeds, hormones/pharmaceutical products, cleaning/disinfecting substances/materials, waste management, and maintaining records/log-sheets of using them.

(1.1.4) Facilitate using solar power at hatcheries:

The equipment and materials relating to solar power will be procured from certified retailers. They will be operated in an environmentally sound and safer manner. In order to dispose of, at the end of their useful life, the equipment and materials will be handed over to the organizations who would reuse and/or recycle, appropriately conforming to GOB legislation and the BMPs according to USG.

(1.1.5) Promote water filtration and recirculation systems at hatcheries:

The equipment and materials (i.e. charcoals, media) relating to the water-recycling system will be procured from certified retailers. They will be operated in an environmentally sound and safe manner. In order to dispose of, at the end of their useful life, the equipment and

materials will be handed over to the organizations who would reuse and/or recycle, appropriately conforming to GOB legislation and the BMPs according to USG.

(1.1.6) Facilitate improved seed transportation systems:

The Activity will assist LSPs to explore innovative ways (i.e. transportation in containers with battery-supported aerated-water) in order to reduce stress on fingerling, and avoid/minimize using polybags, and hence to minimize costs. In order to dispose of, at the end of their useful life, the materials (i.e. containers, polybags) will be reused for storing other materials, and/or will be handed over to organizations who would recycle them, appropriately conforming to GOB legislation and the BMPs according to USG.

(1.1.8) Assist hatcheries/LSPs in conducting farmers' trainings and demonstration trials for their product promotion:

The Activity will assist hatcheries/LSPs in conducting trainings and demonstration trials in a way that would not convert any natural forest, wetland, protected areas (PAs) nor will be extended in an environmentally sensitive area. Introduction of invasive alien fish species will be avoided. Using inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided.

Sub-Purpose 1.2: Increased availability of affordable quality feed.

(1.2.2) Assist feed millers in quality feed production:

The Activity will assist millers in using inputs in feed production that are not approved by the Fish Feed Rules, 2011, and USFDA will be avoided. The Activity will also assist millers in labeling and storing ingredients and additives, cleaning/disinfecting substances/materials, waste management, and to maintain log-sheets for recording day-to-day feed mill operations.

(1.2.3) Assist feed millers in upgrading machinery and equipment:

The equipment and machinery will be procured from certified retailers. They will be operated in an environmentally sound and safe manner. In order to dispose of, at the end of their useful life, the equipment and machinery will be handed over to the organizations who would reuse and/or recycle, as appropriate conforming to GOB legislation and the BMPs according to USG.

(1.2.4) Facilitate to upgrade storage system for both raw materials and feeds:

The Activity will assist millers and dealers to procure equipment and materials from certified retailers, and store materials and feeds after the Guideline developed by the Activity. They will also be assisted in projecting demand at their respective ends, and hence to avoid excessive hoarding. The Activity will also assist DoF to help millers and dealers in labeling and storing feeds, and maintaining records/log-sheets for them.

(1.2.7) Assist feed millers/LSPs in setting demonstration trials for their product promotion:

The Activity will assist DoF and millers/dealer/LSPs in setting demonstration trials in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. The Activity will also assist to use only the approved fish species and inputs (including pharmaceutical products).

(1.2.8) Assist professional associations (i.e. Soybean Association of Bangladesh)/millers/LSPs to accelerate production of major feed ingredients (i.e. soybean/maize production through contact farmers; trash-fish drying):

The Activity will assist professional associations/feed millers/LSPs in conducting trainings and demonstration trials in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. Good Agricultural Practices (GAPs) including IPM will be adopted, which will encourage natural and cultural pest control practices, and view pesticides (organic or chemical) as "last resort" actions to prevent crop

destruction by pests. As part of good pest and disease management practices, the Activity will follow the “*Bangladesh Programmatic Pesticide Evaluation Report & Safer Use Action Plan (PERSUAP), July 2015 (Annex 7)*” for the crops that are included in the PERSUAP, and will arrange an addendum for the crops (i.e. soybean) that are not included. In case of so warrant, chemical pesticides would be used “judicially” pursuant to the aforesaid PERSUAP and its addendums.

(1.2.9) Assist government institutions including universities in developing facilities for quality testing of ingredients and feeds:

The Activity will develop Guideline for waste management relating to quality testing that would generate as a result the intervention and will assist the testing institutions to follow the same. The Activity will assist the institutions in labeling and storing the samples and chemicals/reagents/other materials that would be used for the testing procedure, and maintain records/log-sheets of using and disposing of them.

Sub-Purpose 1.3: Increased adoption of improved pond management practices.

(1.3.3) Assist government institutions, universities, LSPs, in developing facilities for providing “fish-vet” services:

The Activity will assist fish-vets in operating in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. The Activity will assist to use only the approved inputs. The Activity will assist the fish-vets in labeling and storing the materials that would be used for resolving the constraints, and maintain records/log-sheets of using them.

(1.3.4) Assist LSPs in organizing “fish-health camps” by bringing resource persons from DoF, universities, successful farmers, etc.:

The Activity will assist fish-vets in operating in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. The Activity will assist to use only the approved inputs. The Activity will assist the fish-vets in labeling and storing the materials that would be used for resolving the constraints, and maintain records/log-sheets of using them.

(1.3.5) Assist LSPs, feed millers and hatchery operators in organizing Farmers’ Field Days, audio-visual documentation presentations, and other communication means:

The Activity will assist millers/dealer/LSPs in conducting FFDs and communication events in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area.

(1.3.6) Assist institutions in conducting demonstration innovative aquaculture systems e.g. in-pond raceway:

The Activity will conduct the intervention in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. The Activity will assist to use only the approved fish species and inputs.

(1.3.7) Assist LSPs in conducting aquaculture-mechanization demonstration (i.e. automated feeding, aeration, solar power):

The equipment and machinery will be procured from certified retailers. They will be operated in an environmentally sound and safe manner. In order to dispose of, at the end of their useful life, the equipment and machinery will be handed over to the organizations who would reuse and/or recycle, as appropriate conforming to GOB legislation and the BMPs according to USG.

Purpose 2: Strengthened aquaculture value chain.

Sub-Purpose 2.1: Increased market linkages.

(2.1.4) Assist market actors in developing innovative post-harvest handling and transportation systems:

The Activity will develop a Guideline for post-harvest handling and transportation, waste management, and to conduct a quality inspection. The Activity will assist in labeling and storing the materials that would be used for post-harvest handling and transportation.

(2.1.5) Assist LSPs/market actors in developing new fish products, improving existing ones, packaging and branding:

The Activity will develop a Guideline for food processing, transportation, and waste management. The Activity will assist to follow the Guideline for food processing and waste management, and do labeling and storing of the raw materials appropriately.

Sub-Purpose 2.3: Improved enabling environment for inclusive growth in aquaculture.

(2.3.2) Assist universities, research institutions, and consultants in conducting aquaculture-related research and publication:

The Activity will assist universities, research institutions, and consultants in conducting research trials in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area.

Purpose 3: Increased awareness and adoption of nutritional related behaviors.

(3.1) Assist universities, research institutions, and consultants in conducting fish-based nutrition-related research and publication:

In order to facilitate the process, the Activity will assist universities, research institutions, and consultants in developing Guideline for food processing and waste management. The Activity will assist in labeling and storing the materials that would be used for processing.

(3.2) Assist business organizations in developing and marketing fish-based nutrition-sensitive food products:

The Activity will assist to follow the Guideline for food processing and waste management, and do labeling and storing the raw materials appropriately.

(3.5) Assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.:

The Activity will assist in conducting trainings and demonstration trials in a way that would not convert any natural forest or wetland nor will be extended in an environmentally sensitive area. GAPs including IPM will be promoted. The Activity will follow the “*Bangladesh Programmatic Pesticide Evaluation Report & Safer Use Action Plan (PERSUAP), July 2015 (Annex 7)*” for the crops that are included in the PERSUAP, and will arrange an addendum for the crops that are not included. In case of so warrant, chemical pesticides would be used “judicially” pursuant to the aforesaid PERSUAP and its addendums.

4. MONITORING SYSTEM

4.1 Performance Monitoring Measurement

Table 5, presented below are both Stand-alone Environmental Indicators (SEI) and Integrated Environmental Indicators (IEI), both at the output and outcome level. Process Indicators (PI) are also included to verify the completion of prerequisite tasks. Indicator definitions and validation methods are outlined in the EMMP Summary Table (Annex I).

Table 5: Summary of the indicators

Interventions	Indicators
Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and ghers	
Sub-Purpose 1.1: Increased availability of improved fish seed	
(1.1.2) Assist hatcheries and nurseries in quality seed production	<p><u>Process Indicators:</u> PI-1: List of approved fish species to be promoted developed; PI-2: Guideline for maintaining the purity of broodstock developed; PI-3: Guideline for cleaning, disinfection, and waste management for hatchery developed; PI-4: Log sheets for recording day-to-day hatchery operations developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-1: Number of hatcheries used <u>only</u> the approved inputs as specified in Annex 3, and followed appropriate cleaning, disinfection, and waste management procedures as specified in the Guideline IEI-2: Number of hatcheries followed the Guideline for maintaining the purity of broodstock (PI-2); IEI-3: Number of hatcheries updated the log sheets for recording day-to-day operations including waste management (PI-4).</p>
(1.1.4) Facilitate using solar power at hatcheries	<p><u>Process Indicators:</u> PI-5: Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-4: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power (PI-5).</p>
(1.1.5) Promote water-recirculation systems at hatcheries	<p><u>Process Indicators:</u> PI-6: Guideline for installation, operation, and decommissioning the equipment and materials relating to water filtration and recycling system developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-5: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to filtration and water-recycling system (PI-6).</p>
(1.1.6) Facilitate improved seed transportation systems	<p><u>Process Indicators:</u> PI-7: Guideline of waste (i.e. polybags) management relating to fish seed transportation developed; PI-8: Audio-visual motivational documentation on fish seed transportation in containers with battery-supported aerated water developed;</p> <p><u>Stand-alone Environmental Indicators:</u> SEI-1: Number of fish-seed traders trained on fish seed transportation in containers with battery-supported aerated water (PI-8); SEI-2: Number of audio-visual motivational documentation display events on the advantage of fish seed transportation in containers with battery-supported aerated water conducted (PI-8).</p>

Interventions	Indicators
	<p><u>Integrated Environmental Indicators:</u> IEI-6: Percentage of fish growers bought fingerlings that were transported in containers with battery-supported aerated-water (PI-8); IEI-7: Percentage of fish growers followed the Guideline of waste (i.e. polybags) management relating to fish seed transportation (PI-7).</p>
(1.1.8) Assist hatcheries/local service providers (LSPs) in conducting demonstration trials for their product promotion	<p><u>Integrated Environmental Indicators:</u> IEI-8: Percentage of demonstration trials used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3; IEI-9: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3.</p>
Sub-Purpose 1.2: Increased availability of affordable quality feed	
(1.2.2) Assist feed millers in quality feed production	<p><u>Process Indicators:</u> PI-9: Guideline for cleaning, disinfection, and waste management for feed mills developed; PI-10: Log sheets for recording day-to-day feed mill operations developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-10: Number of feed millers used only the approved types and quality of ingredients and additives as specified in the Fish Feed Rules, 2011; IEI-11: Number of feed millers followed appropriate cleaning, disinfection, and waste management procedures as specified in the respective Guideline; IEI-12: Number of feed millers updated the log sheets for recording day-to-day operations including waste management (PI-10)</p>
(1.2.3) Assist feed millers in upgrading machinery and equipment	<p><u>Process Indicators:</u> PI-11: Guideline for installation, operation, and decommissioning the equipment and machinery relating to feed mills developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-13: Number of feed millers followed the Guideline for installation, operation, and decommissioning the equipment and machinery relating to feed mills (PI-11).</p>
(1.2.4) Facilitate to upgrade storage system for feeds	<p><u>Process Indicators:</u> PI-12: Guideline for feed storage developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-14: Number feed millers and percentage of dealers followed the Guideline for feed storage (PI-12).</p>
(1.2.7) Assist feed millers/LSPs in setting demonstration trials for their product promotion	<p><u>Integrated Environmental Indicators:</u> IEI-15: Percentage of demonstration trials used <u>only</u> the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3 IEI-16: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3</p>
(1.2.8) Assist professional associations (i.e. Soybean Association of Bangladesh)/ millers/LSPs to accelerate production of major feed ingredients (i.e. increase soybean/maize production through contact farmers;	<p><u>Process Indicators:</u> PI-13: Addendum to the “Bangladesh Programmatic Pesticide Evaluation Report & Safer Use Action Plan (PERSUAP), July 2015” approved; PI-14: GAPs on the specific grains and vegetables crops developed</p> <p><u>Stand-alone Environmental Indicators:</u> SEI-3: Number of farmers trained on GAPs for respective grain crops (i.e. soybean).</p> <p><u>Integrated Environmental Indicators:</u> IEI-17: Number of demonstration trials on grain cultivation followed the GAPs (PI-14), PERSUAP and its addendums (PI-13); IEI-18: Percentage of (contact) grain farmers followed the GAPs (PI-14),</p>

Interventions	Indicators
trash-fish drying)	PERSUAP and its addendums (PI-13)
(1.2.9) Assist government institutions including universities in developing facilities for quality testing of ingredients and feeds	<p><u>Process Indicators:</u> PI-15: Guideline for waste management generated because of quality testing developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-19: Number of quality testing institutions followed the Guideline for waste management generated because of quality testing (PI-15).</p>
Sub-Purpose 1.3: Increased adoption of improved pond management practice	
(1.3.3) Assist government institutions, universities, consultants, etc. in developing facilities for providing “fish-vet” services	<p><u>Integrated Environmental Indicators:</u> IEI-20: Percent of (fish-vet) actions used only the approved inputs as specified in Annex 3.</p>
(1.3.4) Assist LSPs in organizing fish-health camps by bringing resource persons from DoF, universities, successful farmers, etc.	<p><u>Integrated Environmental Indicators:</u> IEI-21: Percent of (fish-health camp) actions used only the approved inputs as specified in Annex 3.</p>
(1.3.6) Assist institutions in testing/conducting demonstration innovative aquaculture systems e.g. in-pond raceway	<p><u>Process Indicators:</u> PI-16: Guideline for physical construction and process operation of in-pond raceway developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-22: Number of interventions followed the Guideline for physical construction and process operation (PI-16). IEI-23: Number of interventions used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3.</p>
(1.3.7) Assist LSPs in conducting aquaculture-mechanization demonstration (i.e. automated feeding, aeration, solar power)	<p><u>Process Indicators:</u> PI-17: Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-24: Number of interventions followed the Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery (PI-17).</p>
Purpose 2: Strengthened aquaculture value chain	
Sub-Purpose 2.1: Increased market linkages	
(2.1.4) Assist market actors in developing innovative post-harvest handling and transportation systems	<p><u>Process Indicators:</u> PI-18: Guideline for post-harvest handling, transportation, and waste management developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-25: Percentage of the actors in the fish value chain followed the Guideline for post-harvest handling, transportation, and waste management (PI-18).</p>
(2.1.5) Assist LSPs/market actors in developing new fish products, improving the existing ones,	<p><u>Process Indicators:</u> PI-19: Guideline for fish-product processing, transportation, and waste management developed.</p> <p><u>Integrated Environmental Indicators:</u> IEI-26: Percentage of actors in the fish value chain followed the Guideline</p>

Interventions	Indicators
packaging, and branding	for fish-product processing and waste management (PI-19).
Sub-Purpose 2.3: Improved enabling environment for inclusive growth in aquaculture	
(2.3.2) Assist universities, research institutions, and consultants in conducting aquaculture-related research and publication	<u>Integrated Environmental Indicators:</u> IEI-27: Number of aquaculture research trials used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3.
Purpose 3: Increased awareness and adoption of nutritional related behaviors	
(3.1) Assist universities, research institutions, and consultants in conducting fish-based nutrition-related research and publication	<u>Integrated Environmental Indicators:</u> IEI-28: Number of fish-based nutrition-related research trials followed the Guideline for fish-product processing and waste management (PI-19).
(3.2) Assist business organizations in developing and marketing fish-based nutrition-sensitive food products	<u>Integrated Environmental Indicators:</u> IEI-29: Number of fish-based nutrition-related product producers followed the Guideline for fish-product processing and waste management (PI-19).
(3.5) Assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.	<u>Stand-alone Environmental Indicators:</u> SEI-4: Number of farmers trained on GAPs for respective vegetables crops (PI-14). <u>Integrated Environmental Indicators:</u> IEI-30: Number of kitchen gardening/ dike cropping demonstration trials followed the GAPs (PI-14), PERSUAP and its addendums (PI-13); IEI-31: Number of kitchen gardeners/dyke croppers followed the GAPs (PI-14), PERSUAP and its addendums (PI-13).

4.2 Monitoring Plan

A total of **19 Process Indicators**, **4 Stand-alone Environmental Indicators**, and **31 Integrated Environmental Indicators** have been identified to monitor environmental safeguards. As part of the monitoring process, different data collection methods will be used, which would include surveys, annual routine monitoring, reviews of the different training module, and field visit reporting through the Activity's real-time Management Information System (MIS). Detailed descriptions of indicators are included in the EMMP Summary Table. Table 6 describes the summary of monitoring frequency, tools, and method to be applied for each of the indicators.

Table 6: Summary of the tools, methods, and frequency that will be used for the indicators

Indicators	Tools	Frequency	Methods
Process Indicators:			
PI-1: List of approved fish species to be promoted developed	Schedule	Once	Review of schedule
PI-2: Guideline for maintaining the purity of broodstock developed	Guideline	Once	Review of guideline
PI-3: Guideline for cleaning, disinfection, and waste management for hatchery developed	Guideline	Once	Review of guideline
PI-4: Log sheets for recording day-to-day hatchery operations developed	Log sheets	Once	Review of log sheets
PI-5: Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power developed	Guideline	Once	Review of Guideline
PI-6: Guideline for installation, operation, and decommissioning the equipment and materials relating to water filtration and recycling system developed	Guideline	Once	Review of Guideline
PI-7: Guideline of waste (i.e. polybags) management relating to fish seed transportation developed	Guideline	Once	Review of Guideline
PI-8: Audio-visual motivational documentation on fish seed transportation in containers with battery-supported aerated water developed	Documentary	Once	Review of documentary
PI-9: Guideline for cleaning, disinfection, and waste management for feedmills developed	Guideline	Once	Review of guideline
PI-10: Log sheets for recording day-to-day feed mill operations developed	Log sheets	Once	Review of log sheets
PI-11: Guideline for installation, operation, and decommissioning the equipment and machinery relating to feed mills developed	Guideline	Once	Review of Guideline
PI-12: Guideline for feed storage developed	Guideline	Once	Review of Guideline
PI-13: Addendum to the “ <i>Bangladesh Programmatic Pesticide Evaluation Report & Safer Use Action Plan (PERSUAP), July 2015</i> ” approved	Addendum	Once	Review of Addendum
PI-14: GAPs on the specific grains and vegetables crops developed	Modules	Once	Review of modules
PI-15: Guideline for waste management generated because of quality testing developed	Guideline	Once	Review of Guideline
PI-16: Guideline for physical construction and process operation of in-pond raceway developed	Guideline	Once	Review of Guideline
PI-17: Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery developed	Guideline	Once	Review of Guideline
PI-18: Guideline for post-harvest handling, transportation, and waste management developed	Guideline	Once	Review of Guideline
PI-19: Guideline for fish-product processing and waste management developed	Guideline	Once	Review of Guideline
Stand-alone Environmental Indicators:			
SEI-1: Number of fish-seed traders trained on fish seed transportation in containers with battery-supported aerated water (PI-8)	Event Database	Routine	Document through the Activity's MIS
SEI-2: Number of audio-visual motivational documentation display events on the advantage of fish seed transportation in	Event Database	Routine	Document through the Activity's MIS

Indicators	Tools	Frequency	Methods
containers with battery-supported aerated water conducted (PI-8)			
SEI-3: Number of farmers trained on GAPs for respective grains crops (i.e. soybean) (PI-14)	Event Database	Routine	Document through the Activity's MIS
SEI-4: Number of farmers trained on GAPs for respective vegetables crops (PI-14)	Event Database	Routine	Document through the Activity's MIS
Integrated Environmental Indicators:			
IEI-1: Number of hatcheries used <u>only</u> the approved inputs as specified in Annex 3, and followed appropriate cleaning, disinfection, and waste management procedures as specified in the Guideline	Site Visit Forms – Hatchery	Routine	Document through the Activity's MIS
IEI-2: Number of hatcheries followed the Guideline for maintaining the purity of broodstock (PI-2)	Site Visit Forms – Hatchery	Routine	Document through the Activity's MIS
IEI-3: Number of hatcheries updated the log sheets for recording day-to-day operations including waste management (PI-4)	Site Visit Forms – Hatchery	Routine	Document through the Activity's MIS
IEI-4: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power (PI-5)	Site Visit Forms – Hatchery	Routine	Document through the Activity's MIS
IEI-5: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to filtration and water-recycling system (PI-6)	Site Visit Forms – Hatchery	Routine	Document through the Activity's MIS
IEI-6: Percentage of fish growers bought fingerlings that were transported in containers with battery-supported aerated-water (PI-8)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-7: Percentage of fish growers followed the Guideline of waste (i.e. polybags) management relating to fish seed transportation (PI-7)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-8: Percentage of demonstration trials used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3	Site Visit Forms – Grower	Routine	Document through the Activity's MIS
IEI-9: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-10: Number of feed millers used only the approved types and quality of ingredients and additives as specified in the Fish Feed Rules, 2011	Site Visit Forms – Feed Mill	Routine	Document through the Activity's MIS
IEI-11: Number of feed millers followed appropriate cleaning, disinfection, and waste management procedures as specified in the respective Guideline	Site Visit Forms – Feed Mill	Routine	Document through the Activity's MIS
IEI-12: Number of feed millers updated the log sheets for recording day-to-day operations including waste management (PI-10)	Site Visit Forms – Feed Mill	Routine	Document through the Activity's MIS
IEI-13: Number of feed millers followed the Guideline for installation, operation, and decommissioning the equipment and machinery relating to feed mills (PI-11)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-14: Number feed millers and percentage of	Site Visit	Routine	Document

Indicators	Tools	Frequency	Methods
dealers followed the Guideline for feed storage (PI-12)	Forms – Feed Mill		through the Activity's MIS
IEI-15: Percentage of demonstration trials used <u>only</u> the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3	Site Visit Forms – Grower	Routine	Document through the Activity's MIS
IEI-16: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-17: Number of demonstration trials on grain cultivation followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)	Site Visit Forms – Grower	Routine	Document through the Activity's MIS
IEI-18: Percentage of (contact) grain farmers followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-19: Number of quality testing institutions followed the Guideline for waste management generated because of quality testing (PI-15)	Site Visit Forms – Support	Routine	Document through the Activity's MIS
IEI-20: Percent of (fish-vet) actions used only the approved inputs as specified in Annex 3	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-21: Percent of (fish-health camp) actions used only the approved inputs as specified in Annex 3	Event Database	Routine	Document through the Activity's MIS
IEI-22: Number of interventions followed the Guideline for physical construction and process operation (PI-16)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-23: Number of interventions used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-24: Number of interventions followed the Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery (PI-17)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-25: Percentage of the actors in the fish value chain followed the Guideline for post-harvest handling, transportation, and waste management (PI-18)	Site Visit Forms – Post-harvest	Routine	Document through the Activity's MIS
IEI-26: Percentage of actors in the fish value chain followed the Guideline for fish-product processing and waste management (PI-19)	Site Visit Forms – Post-harvest	Routine	Document through the Activity's MIS
IEI-27: Number of aquaculture research trials used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3	Site Visit Forms – Aquaculture	Routine	Document through the Activity's MIS
IEI-28: Number of fish-based nutrition-related research trials followed the Guideline for fish-product processing and waste management (PI-19)	Site Visit Forms – Post-harvest	Routine	Document through the Activity's MIS
IEI-29: Number of fish-based nutrition-related product producers followed the Guideline for fish-product processing and waste management (PI-19)	Questionnaire	Baseline, Mid-term, & Endline	Survey
IEI-30: Number of kitchen gardening/ dike cropping demonstration trials followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)	Site Visit Forms – Aquaculture	Routine	Document through the Activity's MIS
IEI-31: Number of kitchen gardeners/dyke croppers	Questionnaire	Baseline,	Survey

Indicators	Tools	Frequency	Methods
followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)		Mid-term, & Endline	

4.2.1 Staffing

According to the requirement of Reg. 216, implementation of the EMMP will be carried out by a team effort of all personnel of the Activity where the Environment Specialist (ES) will facilitate the process. In order to ensure that the Activity has minimal negative impacts on the environment, the ES will train all the relevant budgeted staffs and the personnel of sub-Grantees. The ES will develop the guidelines and templates for different types of record keeping.

Along with their day-to-day activities, the Market System Development Specialists (MSDSs) will work closely with the sub-Grantees and beneficiaries in educating them about the importance of environmental safeguarding and encourage for compliance. In appropriate cases, the respective personnel of the sub-Grantees will maintain records and log-sheets. Any WorldFish staff (belonging to either MSD, Grants, MEL or cross-cutting teams) visiting sub-Grantees will check the environmental compliance issues as specified in the EMMP Summary Table (Annex 2), monitor the records and log-sheets, fill out the "Site Visit Reporting Form (SVRF)", and upload the same on the Activity's real-time MIS/OCS. Along with making periodic site visits, the ES will be primarily responsible to oversee the process and report to USAID through CoP/DCoP. As required, the ES will conduct surveys and studies in this connection.

4.2.2 Schedule

A monitoring schedule for each indicator can be found in the EMMP Summary Table (Annex I).

4.2.3 Budget

Environmental mitigation activities will primarily be done by the budgeted staff members. Environmental mitigation costs will be included in the Activity costs as well as the sub-Grants to the private sector and other organizations. However, budget realignment will be done once costs are more accurately understood.

5. CORRECTIVE ACTION PLAN

The ES will meet with the MSD, Grants, MEL Team Leaders under the guidance of CoP/DCoP once a quarter prior to the submission of the Environmental Status Report to, 1) discuss the effectiveness of the mitigation measures to protect against environmental harm, 2) review feasibility of data collection, 3) address budget realignments for EMMP actions, and 4) recommend adjustments to mitigation measures, indicators, or indicator criteria.

Adjustments will be in-line with the 4 EMMP guiding principles:

- Realistic – Achievable with time, resources, and capabilities
- Well-targeted – Mitigation measures must respond to the IEE conditions which in turn should correspond to the identified environmental threats and stressors for the area of implementation.
- Prevention-focused – Prevention of negative environmental effects is usually cheaper than remediation.
- Funded – There must be sufficient budget to cover the implementation of the mitigation measures and their monitoring otherwise the actions cannot be achieved.

6. REPORTING

6.1 Visit Reports

Site visit reports will be modified according to the needs of the Activity in order to gather the necessary information. Annex 4 – “Site Visit Reporting Forms” provides examples of site visit reports for mitigation measures. This is just a sampling of the most obvious mitigation measures which will require a site visit form. Other mitigation measures may also need site visit reports and will be developed based on reporting requirements. Any additional forms will be added to this EMMP.

6.2 Reporting Schedule

Reporting of process indicators will generally take place through Quarterly Progress Reports. Output and outcome indicators will generally be reported on an annual basis. Reporting schedule for each indicator is identified in the EMMP Summary Table (Annex I).

Feed the Future Bangladesh Aquaculture and Nutrition Activity

APPROVAL OF Environmental Mitigation and Monitoring Plan:

A. Clearances:

Implementer Project Director/COP: M. W. Pichu Date: 13 Sept 2018

USAID/ Project C/AOR:  Date: 09/16/2018

B. Approval:

USAID/Bangladesh Mission
Environmental Officer (A):  Date: 9/16/2018

✓ Approved: -----

Disapproved: -----

C. Copy to:

Asia Bureau Environmental Officer

ANNEX I: ENVIRONMENTAL MITIGATION AND MONITORING PLAN SUMMARY TABLE

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and <i>ghers</i>.					
Sub-Purpose 1.1: Increased availability of improved fish seed.					
(1.1.2) Assist hatcheries and nurseries in quality seed production	Bio-safety might be disrupted if invasive alien species introduced	Introduction of invasive alien fish species will be avoided	PI-1: List of approved fish species to be promoted developed	Once	Environment Specialist (ES) will develop, and will report to USAID in the Quarterly & Annual Reports (QARs)
		Maintaining brood-stock purity will be promoted, and inbreeding or other causes of seed adulteration will be avoided	PI-2: Guideline for maintaining the purity of broodstock developed;	Once	Consultant will develop; ES will coordinate, and report to USAID in the QARs
			IEI-2: Number of hatcheries followed the Guideline for maintaining the purity of broodstock (PI-2)	Routine	Market System Development Team (MSDT), Grants Team (GT), Monitoring, Evaluation & Learning Team (MELT) & ES will visit and upload Site Visit Reporting Forms (SVRFs) in MIS; MELT will analyze, and ES will coordinate, and report to USAID in the QARs
	Food safety might be disrupted if harmful inputs/chemicals are used and/or appropriate cleaning, disinfection and waste management, are not followed	Using inputs in seed production that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided	PI-3: Guideline for cleaning, disinfection, and waste management for hatchery developed	Once	ES will develop, and report to USAID in the QARs
		Appropriate cleaning, disinfection, and waste management will be followed	PI-4: Log sheets for recording day-to-day hatchery operations developed	Once	ES will develop, and report to USAID in the QARs
			IEI-1: Number of hatcheries used <u>only</u> the approved inputs as specified in Annex 3, and followed appropriate cleaning, disinfection,	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
					MSDT, GT, MELT & ES will

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
			and waste management procedures as specified in the Guideline IEI-3: Number of hatcheries updated the log sheets for recording day-to-day operations including waste management (PI-4)	Routine	visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.1.4) Facilitate using solar power at hatcheries	It would have no significant adverse effects on the environment if equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner	Equipment and materials will be procured from certified retailers; operated in an environmentally sound and safer manner; disposed of, at the end of their useful life, in order to reuse and/or recycle, as appropriate & conforming to GOB & USG legislations	PI-5: Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power developed IEI-4: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to solar power (PI-5)	Once Routine	Consultant will develop; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.1.5) Promote water-recirculation systems at hatcheries	It would have no significant adverse effects on the environment if equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner	Equipment and materials will be procured from certified retailers; operated in an environmentally sound and safer manner; disposed of, at the end of their useful life, in order to reuse and/or recycle, as appropriate & conforming to GOB & USG legislations	PI-6: Guideline for installation, operation, and decommissioning the equipment and materials relating to water filtration and recycling system developed IEI-5: Number of hatcheries followed the Guideline for installation, operation, and decommissioning the equipment and materials relating to filtration and water-recycling system (PI-6)	Once Routine	Consultant will develop; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.1.6) Facilitate improved seed transportation systems	It would have significant adverse effects on the environment if using polybags cannot be avoided, minimized, or reused	In order to avoid using polybags, innovative ways (i.e. transportation in containers with battery-supported aerated-water) will be explored	PI-8: Audio-visual motivational documentation on fish seed transportation in containers with battery-supported aerated water developed SEI-1: Number of fish-seed traders	Once Routine	Consultant & Communication Specialist (CS) will develop; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
			<p>trained on fish seed transportation in containers with battery-supported aerated water (PI-8)</p> <p>SEI-2: Number of audio-visual motivational documentation display events on the advantage of fish seed transportation in containers with battery-supported aerated water conducted (PI-8)</p> <p>IEI-6: Percentage of fish growers bought fingerlings that were transported in containers with battery-supported aerated-water (PI-8)</p> <p>PI-7: Guideline of waste (i.e. polybags) management relating to fish seed transportation developed</p> <p>IEI-7: Percentage of fish growers followed the Guideline of waste (i.e. polybags) management relating to fish seed transportation (PI-7)</p>	<p>Routine</p> <p>Baseline Mid-term, & Endline</p> <p>Once</p> <p>Baseline, Mid-term, & Endline</p>	<p>visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs</p> <p>MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs</p> <p>MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID</p> <p>ES will develop, and report to USAID in the QARs</p> <p>MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID</p>

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
(1.1.8) Assist hatcheries/ LSPs in conducting demonstration trials for their product promotion	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be disrupted if used harmful inputs/chemicals; aquaculture might be extended to PAs or environmentally sensitive areas	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided; trainings and demonstration trials will be conducted in a way that would not convert any protected areas (PAs) nor will be extended in an environmentally sensitive area	IEI-8: Percentage of demonstration trials used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3 IEI-9: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and approved inputs as specified in Annex 3	Routine Baseline, Mid-term, & Endline	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
Sub-Purpose 1.2: Increased availability of affordable quality feed					
(1.2.2) Assist feed millers in quality feed production	Fish-health and food-safety might be disrupted if feed adulteration takes place Environmental pollution might be taken place	Using inputs in feed production that are not approved by the Fish Feed Rules, 2011, and USFDA will be avoided Appropriate cleaning, disinfection, and waste management will be followed Labeling and storing ingredients, additives, and cleaning/disinfecting substances/materials, and updating log-sheets for recording day-to-day operations will be facilitated	IEI-10: Number of feed millers used only the approved types and quality of ingredients and additives as specified in the Fish Feed Rules, 2011 IEI-11: Number of feed millers followed appropriate cleaning, disinfection, and waste management procedures as specified in the respective Guideline PI-10: Log sheets for recording day-to-day feed mill operations developed IEI-12: Number of feed millers updated the log sheets for recording day-to-day operations including waste management (PI-10)	Routine Routine Once Routine	MSDT, GT, MELT & ES will upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs ES will develop, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.2.3) Assist feed millers in upgrading	It would have no significant adverse effects on the	Equipment and materials will be procured from certified retailers; operated in an environmentally	PI-11: Guideline for installation, operation, and decommissioning the equipment and machinery	Once	Consultant will develop; ES will coordinate, and report to USAID in the QARs

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
machinery and equipment	environment if equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner	sound and safer manner; disposed of, at the end of their useful life, in order to reuse and/or recycle, as appropriate & conforming to GOB & USG legislations	relating to feed mills developed	Baseline, Mid-term, & Endline	MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
(1.2.4) Facilitate to upgrade storage system for feeds	It might have some impacts on the environment, fish, and hence human-health if not feeds are stored in an appropriate way, and not delivered within the appropriate period	Equipment and materials will be procured from certified retailers; materials and feeds will be stored after the Guideline developed by the Activity; excessive hoarding will be avoided; stuff will be labeled and log sheet will be maintained	PI-12: Guideline for feed storage developed IEI-14: Number feed millers and percentage of dealers followed the Guideline for feed storage (PI-12)	Once Routine	ES will develop, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.2.7) Assist feed millers/LSPs in setting demonstration trials for their product promotion	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be disrupted is used harmful inputs/chemicals; aquaculture might be extended to PAs or environmentally sensitive areas	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided; trainings and demonstration trials will be conducted in a way that would not convert any PAs nor will be extended in an environmentally sensitive area	IEI-15: Percentage of demonstration trials used only the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3 IEI-16: Percentage of (replicate) farmers used the approved cultivable fish species (PI-1) and the inputs as specified in Annex 3	Routine Baseline, Mid-term, & Endline	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
(1.2.8) Assist professional associations (i.e. Soybean Association of Bangladesh)/ millers/LSPs to accelerate	It might have some significant impacts on the environment if inappropriate inputs (i.e. chemical fertilizers, insecticides) are used, or is extended to environmentally	GAPs including IPM will be promoted; Bangladesh Programmatic PERSUAP will be followed, and addendum will be done for the crops that are not included; trainings and demonstration trials will be conducted in a way that would	PI-13: Addendum to the "Bangladesh Programmatic Pesticide Evaluation Report & Safer Use Action Plan (PERSUAP), July 2015" approved PI-14: GAPs on the specific crops developed	Once Once	ES, DCoP & CoP will facilitate the process Consultant will develop; ES will coordinate, and report to USAID in the QARs

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
production of major feed ingredients (i.e. increase soybean/maize production through contact farmers; trash-fish drying)	sensitive areas	not convert any PAs nor will be extended in an environmentally sensitive area	SEI-3: Number of farmers trained on GAPs for respective grains/crops IEI-17: Number of demonstration trials on grain cultivation followed the GAPs (PI-14), PERSUAP and its addendums (PI-13) IEI-18: Percentage of (contact) grain farmers followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)	Routine Routine Baseline, Mid-term, & Endline	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
(1.2.9) Assist government institutions including universities in developing facilities for quality testing of ingredients and feeds	It might have some impacts on the environment and human health if appropriate waste management is not applied	Guideline for waste management relating to quality testing will be developed, and will be assisted the testing institutions to follow the same; samples, chemicals/reagents, other materials will be labeled and stored in an appropriate way, and log-sheets will be maintained	PI-15: Guideline for waste management generated because of quality testing developed IEI-19: Number of quality testing institutions followed the Guideline for waste management generated because of quality testing (PI-15)	Once Routine	ES will develop, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
Sub-Purpose 1.3: Increased adoption of improved pond management practices					
(1.3.3) Assist government institutions, universities, consultants, etc. in developing facilities for	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be disrupted is used harmful inputs/chemicals;	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided; trainings and demonstration trials will be conducted in a way that would	IEI-20: Percent of (fish-vet) actions used only the approved inputs as specified in Annex 3	Baseline, Mid-term, & Endline	MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
providing “fish-vet” services	aquaculture might be extended to PAs or environmentally sensitive areas	not convert any PAs nor will be extended in an environmentally sensitive area			
(1.3.4) Assist LSPs in organizing fish-health camps by bringing resource persons from DoF, universities, successful farmers, etc.	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be disrupted if used harmful inputs/chemicals; aquaculture might be extended to PAs or environmentally sensitive areas	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided; trainings and demonstration trials will be conducted in a way that would not convert any PAs nor will be extended in an environmentally sensitive area	IEI-21: Percent of (fish-health camp) actions used only the approved inputs as specified in Annex 3	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(1.3.6) Assist institutions in testing & conducting demonstration innovative aquaculture systems e.g. in-pond raceway	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be disrupted if used harmful inputs/chemicals; aquaculture might be extended to PAs or environmentally sensitive areas	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will be avoided; trainings and demonstration trials will be conducted in a way that would not convert any PAs nor will be extended in an environmentally sensitive area	PI-16: Guideline for physical construction and process operation of in-pond raceway developed IEI-22: Number of interventions followed the Guideline for physical construction and process operation (PI-16) IEI-23: Number of interventions used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3	Once Baseline, Mid-term, & Endline Baseline, Mid-term, & Endline	ES will develop, and report to USAID in the QARs MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
(1.3.7) Assist LSPs in conducting aquaculture-	The intervention would have no significant adverse effects on the environment if the	The equipment and machinery will be procured from certified retailers, operated in a sound and safe manner, and disposed	PI-17: Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery developed	Once	ES will develop, and report to USAID in the QARs

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
mechanization demonstration (i.e. automated feeding, aeration, solar power)	equipment and materials are procured, installed, and disposed of in an environmentally sound and safe manner	of, at the end of their useful life, as appropriate conforming to GOB legislation and the BMPs according to USG	EI-24: Number of interventions followed the Guideline for installation, operation, and decommissioning the aquaculture equipment and machinery (PI-17)	Baseline, Mid-term, & Endline	MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
Purpose 2: Strengthened aquaculture value chain					
Sub-Purpose 2.1: Increased market linkages					
(2.1.4) Assist market actors in developing innovative post-harvest handling and transportation systems	It might have some impacts on the environment and human health if used hazardous inputs, and not adopted appropriate waste management procedure	The Activity will develop Guideline for post-harvest handling and transportation, waste management, and to conduct a quality inspection. The Activity will assist in labeling and storing the materials that would be used for post-harvest handling and transportation	PI-18: Guideline for post-harvest handling, transportation, and waste management developed IEI-25: Percentage of the actors in the fish value chain followed the Guideline for post-harvest handling, transportation, and waste management (PI-18)	Once Routine	ES will develop, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
(2.1.5) Assist LSPs/market actors in developing new fish products, improving the existing ones, packaging, and branding	It might have some impacts on the environment and human health if used hazardous inputs, and not adopted appropriate waste management procedure	The Activity will develop Guideline for processing, transportation, and waste management. The Activity will assist to follow the Guideline, and do labeling and storing the raw materials appropriately.	PI-19: Guideline for fish-product processing, transportation, and waste management developed IEI-26: Percentage of actors in the fish value chain followed the Guideline for fish-product processing and waste management (PI-19)	Once Routine	ES will develop, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
Sub-Purpose 2.3: Improved enabling environment for inclusive growth in aquaculture					
(2.3.2) Assist universities, research institutions, and	Bio-safety might be disrupted if invasive alien species introduced, and food safety might be	Introduction of invasive alien fish species will be avoided; using of inputs that are not approved by the Fish Hatchery Rules, 2011, and USFDA will	IEI-27: Number of aquaculture research trials used only the approved fish species (PI-1) and only the approved inputs as specified in Annex 3	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs

Activities	Potential Impact(s)	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring & Reporting Frequency	Party(ies) Responsible
consultants in conducting aquaculture-related research and publication	disrupted is used harmful inputs/chemicals; aquaculture might be extended to PAs or environmentally sensitive areas	be avoided; trainings and demonstration trials will be conducted in a way that would not convert any PAs nor will be extended in an environmentally sensitive area			
Purpose 3: Increased awareness and adoption of nutritional related behaviors					
(3.2) Assist business organizations in developing and marketing fish-based nutrition-sensitive food products	It might have some impacts on the environment and human health if hazardous inputs (including additives) are used and/or appropriate waste management is not adopted	The Activity will assist to follow the Guideline for food processing and waste management, and do labeling and storing the raw materials appropriately.	IEI-29: Number of fish-based nutrition-related product producers followed the Guideline for fish-product processing and waste management (PI-19)	Baseline, Mid-term, & Endline	MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID
(3.5) Assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.	It might have some significant impacts on the environment if inappropriate inputs (i.e. chemical fertilizers, insecticides) are used, or is extended to environmentally sensitive areas	GAPs including IPM will be promoted; Bangladesh Programmatic PERSUAP will be followed, and addendum will be done for the crops that are not included; trainings and demonstration trials will be conducted in a way that would not convert any PAs nor will be extended in an environmentally sensitive area	SEI-4: Number of farmers trained on GAPs for respective crops (PI-14) IEI-30: Number of kitchen gardening/ dike cropping demonstration trials followed the GAPs (PI-14), PERSUAP and its addendums (PI-13) IEI-31: Number of kitchen gardeners/dyke croppers followed the GAPs (PI-14), PERSUAP and its addendums (PI-13)	Routine Routine Baseline, Mid-term, & Endline	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs MSDT will supervise survey data collection; MELT will process & analyze data; ES will design, coordinate, and report to USAID

ANNEX II: CLIMATE RISK MANAGEMENT SUMMARY TABLE

Activities	Climate Risk(s)	Climate Risk Rating	Climate Risk Management/Mitigation Measures	Monitoring & Reporting Frequency	Party(ies) Responsible
Purpose 1: Increased productivity, production and quality of aquaculture output from ponds and <i>ghers</i> .					
Sub-Purpose 1.1: Increased availability of improved fish seed.					
(1.1.2) Assist hatcheries and nurseries in quality seed production	Precipitation: Shifts in the distribution and change in the pattern of precipitation affect quality fresh-water availability for broodstock rearing and hatching.	High	<ul style="list-style-type: none">▪ Promotion of pond re-excavation and installation of tube-wells/pumps to overcome fresh-water scarcity;▪ Repair dikes to prevent overtopping of storm surges;▪ Invest in water-recirculation systems to increase the efficiency of the available water.	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
	Salinity: Increased salinity due to sea level rise and storm surges may hamper broodstock maturity and hatching rate.	High			
	Parasites and diseases: Increased prevalence of parasites and diseases that affect broodstock and spawn due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate	<ul style="list-style-type: none">▪ Improve broodstock health monitoring and pond-water quality management;▪ Improve cleaning and disinfecting, and confinement processes for hatchery operation;▪ Strengthen disease surveillance facilities.		
(1.1.8) Assist hatcheries/ LSPs in conducting demonstration trials for their product promotion	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may hamper aquaculture.	Moderate	<ul style="list-style-type: none">▪ Select appropriate fish species that are more saline tolerant;	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
	Parasites and diseases: Increased prevalence of parasites and diseases that affect aquaculture due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate	<ul style="list-style-type: none">▪ Improve fish health monitoring and pond-water quality management▪ Strengthen disease surveillance facilities.		
Sub-Purpose 1.2: Increased availability of affordable quality feed					
(1.2.7) Assist feed millers/ LSPs in setting demonstration trials for their product	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may hamper aquaculture.	Moderate	<ul style="list-style-type: none">▪ Select appropriate fish species that are more saline tolerant;	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and
	Parasites and diseases: Increased prevalence of parasites and diseases that affect aquaculture due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate	<ul style="list-style-type: none">▪ Improve fish health monitoring and pond-water quality management▪ Strengthen disease surveillance facilities.		

Activities	Climate Risk(s)	Climate Risk Rating	Climate Risk Management/Mitigation Measures	Monitoring & Reporting Frequency	Party(ies) Responsible
promotion					report to USAID in the QARs
(1.2.8) Assist professional associations/ millers/LSPs to accelerate production of ingredients (i.e. soybean/maize production through contact farmers)	Heat stress: Due to increased temperature, shorten developmental phases and reduce light perception over the shortened life cycle; perturb the processes associated with carbon assimilation; and reduced yield	Moderate	<ul style="list-style-type: none">▪ ICT to disseminate information and recommendations about shifting planting dates or even switching crops;▪ Develop and promote heat-stress, salinity, and draught-tolerant varieties;▪ Broadening genetic base and enhancing genetic variability;▪ Promote soil fertility conservation practices;▪ Sustainable intensification to mitigate the effects of climatic and salinity stress and loss of soil fertility due to excessive chemical inputs.	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
	Precipitation: Shifts in the distribution and change in the pattern of precipitation affect stunted ripening of kernels and yield reduction	Moderate			
	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may reduce germination rate, affect plant physiology and growth, nutrient deficiency, a significant reduction in yield; decreased reproductive growth; affects the metabolism of soil organisms, leading to severely reduced soil fertility.	Moderate			
Sub-Purpose 1.3: Increased adoption of improved pond management practices					
(1.3.6) Assist institutions in conducting innovative aquaculture systems e.g. in-pond raceway	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may hamper aquaculture.	Moderate	<ul style="list-style-type: none">▪ Select appropriate fish species that are more saline tolerant;	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
	Parasites and diseases: Increased prevalence of parasites and diseases that affect aquaculture due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate	<ul style="list-style-type: none">▪ Improve fish health monitoring and pond-water quality management;▪ Strengthen disease surveillance facilities.		
Purpose 2: Strengthened aquaculture value chain					
Sub-Purpose 2.1: Increased market linkages					
Sub-Purpose 2.3: an Improved enabling environment for inclusive growth in aquaculture					
(2.3.2) Assist universities, research	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may hamper aquaculture.	Moderate	Select appropriate fish species that are more saline tolerant;	Routine	MSDT, GT, MELT & ES will visit and upload

Activities	Climate Risk(s)	Climate Risk Rating	Climate Risk Management/Mitigation Measures	Monitoring & Reporting Frequency	Party(ies) Responsible
institutions, in conducting aquaculture-research and publication	Parasites and diseases: Increased prevalence of parasites and diseases that affect aquaculture due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate	<ul style="list-style-type: none"> Improve fish health monitoring and pond-water quality management; Strengthen disease surveillance facilities. 		SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
Purpose 3: Increased awareness and adoption of nutrition related behaviors					
(3.5) Assist LSPs, universities, research institutions, and consultants in conducting demonstration trials of kitchen gardening, dike cropping, mola/SIS cultivation with carps, etc.	Heat stress: Due to increased temperature, shorten developmental phases and reduce light perception over the shortened life cycle; perturb the processes associated with carbon assimilation; and reduced yield	Moderate	<ul style="list-style-type: none"> ICT to disseminate information and recommendations about shifting planting dates or even switching crops; Develop and promote heat-stress, salinity, and draught-tolerant varieties; Broadening genetic base and enhancing genetic variability; Promote soil fertility conservation practices; Sustainable intensification to mitigate the effects of climatic and salinity stress and loss of soil fertility due to excessive chemical inputs. 	Routine	MSDT, GT, MELT & ES will visit and upload SVRFs in MIS; MELT will analyze; ES will coordinate, and report to USAID in the QARs
	Precipitation: Shifts in the distribution and change in the pattern of precipitation affect stunted ripening of kernels and yield reduction	Moderate			
	Salinity: Increased salinity due to erratic rainfall, sea level rise and storm surges may reduce germination rate, affect plant physiology and growth, nutrient deficiency, a significant reduction in yield; decreased reproductive growth; affects the metabolism of soil organisms, leading to severely reduced soil fertility.	Moderate			
	Parasites and diseases: Increased prevalence of parasites and diseases that affect aquaculture due to erratic climatic conditions may affect distribution and abundance of disease vectors.	Moderate			

ANNEX III: DUE DILIGENCE FORMS

ENVIRONMENTAL REVIEW AND ASSESSMENT CHECKLIST (ER Checklist)

A. CHECKLIST FOR ENVIRONMENTAL CONSEQUENCES:

Check appropriate column as Yes (Y), Maybe (M), No (N) or Beneficial (B).

1. Earth Resources

- | | |
|--|----------|
| a. grading, trenching, or excavation in cubic meters or hectare | <u>B</u> |
| b. geologic hazards (faults, landslides, liquefaction, un-engineered fill, etc.) | <u>N</u> |
| c. contaminated soils or ground water on the site | <u>N</u> |
| d. offsite overburden/waste disposal or borrow pits required in cubic meters or tons | <u>B</u> |
| e. loss of high-quality farmlands in hectares | <u>N</u> |

2. Agricultural and Agrochemical

- | | |
|---|----------|
| a. impacts of inputs such as seeds and fertilizers | <u>B</u> |
| b. impact of production process on human health and environment | <u>B</u> |
| c. other adverse impacts | <u>N</u> |

3. Industries

- | | |
|---|----------|
| a. impacts of run-off and run-on water | <u>M</u> |
| b. impact of farming such as intensification or extensification | <u>M</u> |
| c. impact of other factors | <u>N</u> |

4. Air Quality

- | | |
|---|----------|
| a. substantial increase in onsite air pollutant emissions (construction/operation) | <u>N</u> |
| b. violation of applicable air pollutant emissions or ambient concentration standards | <u>N</u> |
| c. substantial increase in vehicle traffic during construction or operation | <u>N</u> |
| d. demolition or blasting for construction | <u>N</u> |
| e. substantial increase in odor during construction or operation | <u>M</u> |
| f. substantial alteration of microclimate | <u>N</u> |

5. Water Resources and Quality

- | | |
|---|----------|
| a. river, stream or lake onsite or within 30 meters of construction | <u>N</u> |
| b. withdrawals from or discharges to surface or ground water | <u>Y</u> |
| c. excavation or placing of fill, removing gravel from, a river, stream or lake | <u>N</u> |
| d. onsite storage of liquid fuels or hazardous materials in bulk quantities | <u>N</u> |

6. Cultural Resources

- | | |
|---|----------|
| a. prehistoric, historic, or paleontological resources within 30 meters of construction | <u>N</u> |
| b. site/facility with unique cultural or ethnic values | <u>N</u> |

7. Biological Resources

- | | |
|--|----------|
| a. vegetation removal or construction in wetlands or riparian areas in hectare | <u>N</u> |
| b. use of pesticides/rodenticides, insecticides, or herbicides in hectare | <u>M</u> |
| c. construction in or adjacent to a designated wildlife refuge | <u>N</u> |

8. Planning and Land Use

- | | |
|--|----------|
| a. potential conflict with adjacent land uses | <u>N</u> |
| b. non-compliance with existing codes, plans, permits or design factors | <u>N</u> |
| c. construction in national park or designated recreational area | <u>N</u> |
| d. create substantially annoying source of light or glare | <u>N</u> |
| e. relocation of >10 individuals for +6 months | <u>N</u> |
| f. interrupt necessary utility or municipal service > 10 individuals for +6 months | <u>N</u> |
| g. substantial loss of inefficient use of mineral or non-renewable resources | <u>N</u> |
| h. increase existing noise levels >5 decibels for +3 months | <u>N</u> |

9. Traffic, Transportation and Circulation

- | | |
|--|----------|
| a. increase vehicle trips >20% or cause substantial congestion | <u>N</u> |
|--|----------|

- b. design features cause or contribute to safety hazards _N_
c. inadequate access or emergency access for anticipated volume of people or traffic _N_

10. Hazards

- a. substantially increase risk of fire, explosion, or hazardous chemical release _N_
b. bulk quantities of hazardous materials or fuels stored on site +3 months _N_
c. create or substantially contribute to human health hazard _N_

11. Other Issues (to be used for categories not captured under 1 through 10 above)

- a. substantial adverse impact _N_
b. adverse impact _N_
c. minimal impact _N_

B. EXPLANATION OF ENVIRONMENTAL CONSEQUENCES

explain Y, M & B responses

Explanation	
Earth Resources	<p>a. Bio-deposition takes place on the aquaculture pond-beds, which needs to be removed after every couple of years. In order to maintain the pond-ecosystem favorable to the culture stock, the re-excavation may become important. Some ponds may also need to repair their dikes.</p> <p>b. To facilitate composting of the bio-degradable wastes from feed mills, hatcheries, and fish supply chain, borrowing pits may become important.</p>
Agricultural and agrochemical	<p>a. For aquaculture, only the local fish species, and the exotic ones that have already been proved to be beneficial for pond ecosystem will be considered. To ensure the process, the Activity will develop a list of approved fish species, and will document BMPs for pond-aquaculture;</p> <p>b. For vegetable cultivation on pond-dikes, the types and their varieties/lines that are less susceptible to pest infestation and/or can be grown by applying BMP (i.e. IPM) will only be considered. To ensure the process, the Activity will develop a list of approved vegetables, and will document BMPs for pond-dike cropping;</p> <p>c. Aforesaid points ("a" and "b") will ensure that the production process will be beneficial for human health and environment.</p>
Industries	<p>a. Storm-water from feed mills may cause soil and/or water pollution if not managed well. The Activity will assist the targeted feed mills to develop and comply ESMS.</p>
Air Quality	<p>a. Feed ingredients (i.e. fish meal) of the feed mills may cause a substantial increase in odor if not managed well. The Activity will assist the targeted feed mills to develop and comply their ESMS.</p>
Water Resources and Quality	<p>a. Some ponds may need to withdraw and discharge to surface water occasionally from adjacent canals;</p> <p>b. Hatcheries withdraw water from the ground and/or surface, and may discharge either to their own ponds, or to adjacent canals occasionally;</p> <p>c. Feed mills are not water-based industry but for cleaning and washing purpose they withdraw water from the ground and/or surface and may discharge either to their own ponds, or to adjacent canals occasionally.</p>
Biological Resources	<p>a. Pesticides may need to be used in vegetable cultivation on pond-dikes. However, BMP will be applied in order to make the use 'judicial.'</p> <p>b. Hatcheries and feed mills may also need to use pesticides for some reasons occasionally. The Activity will assist the targeted hatcheries and feed mills to develop and comply their ESMS.</p>

C. RECOMMENDED ACTION:

highlight appropriate action

1. The project has no potential for substantial adverse environmental effects. No further environmental review is required.
2. The project has little potential for substantial adverse environmental effects; however the recommended mitigation measures will be developed and incorporated in the project design and/or construction, operation and maintenance phases. No further environmental review is required.
3. The project has substantial but mitigatable adverse environmental effects and required measures to mitigate environmental effects. Mitigation and Monitoring (M&M) Plan must be developed and approved by the MEO prior to implementation. M&M Plan is to be attached to the Scope of Work.
4. The project has potentially substantial adverse environmental effects, but requires more analysis to form a conclusion. *A Scoping Statement must be prepared and be submitted to the BEO for approval. Following BEO approval an Environmental Assessment (EA) will be conducted. Project may not be implemented until the BEO approves the final EA.*
5. The project has potentially substantial adverse environmental effects, and revisions to the project design or location or the development of new alternatives is required.
6. The project has substantial and unmitigatable adverse environmental effects. Mitigation is insufficient to eliminate these effects and alternatives are not feasible. The project is not recommended for funding.

LEOPOLD MATRIX

<div><div>Environmental component</div><div>Project Component</div></div>		PHYSICAL ENVIRONMENT										BIOLOGICAL ENVIRONMENT										SOCIAL ENVIRONMENT									
		Agricultural Land	Soil Erosion	Slope Stability	Energy/Mineral Resources	Surface Water Quantity	Surface Water Quality	Ground Water Quantity	Ground Water Quality	Air Quality	Noise	Aquatic Ecosystems	Wetland Ecosystems	Terrestrial Ecosystems	Endangered Species	Migratory Species	Beneficial Plants	Beneficial Animals	Pest Plants	Pest Animals	Disease Vectors	Public Health	Resource/Land Use	Distribution Systems	Employment	At Risk Population	Migrant Population	Community Stability	Cultural/Religious	Tourism/Recreation	Nutrition
PLANNING & DESIGN	develop innovative fish transportation systems																														
	develop fish-based nutritious products and packaging systems																														
CONSTRUCTION	upgrade machinery and equipment at feed mills, hatcheries				O		O		O	O	O	O		O								O	O	O	O	O					O
	infrastructure development for in-pond raceway system	O	O	O		O	O		O			O	O							O	O	O								O	
	development of filtration and recirculation system					O	O		O			O	O	O				O			O	O								O	
OPERATION	farmers' trainings	O	O				O			O		O		O	O		O	O			O	O	O		O			O	O		O
	demonstration trials	O	O				O			O		O		O	O		O	O			O	O		O			O	O		O	
	using solar power				O		O		O	O	O	O										O	O	O	O	O					O
	water filtration and recirculation systems at hatcheries					O	O		O			O	O				O			O	O								O		O
	cultivation of soybean, vegetable	O															O	O	O			O	O		O				O		O
	fish post-harvest handling, processing & transportation									O		O		O						O	O	O	O	O	O				O		O
	Process fish-based nutritious products																					O		O	O				O	O	O

KEY: Beneficial: O - High; O – Medium; o – Low

Adverse: ■ - High; ■ – Medium; ■ –

ANNEX IV: STANDARD ENVIRONMENTAL CONDITIONS

All the *Standard Environmental Conditions* developed by USAID to ensure that the interventions do not result in significant adverse environmental impact will be applied and are the basis of the *Feed the Future Bangladesh Aquaculture and Nutrition Activity EMMP*. When adherence to these conditions is required as a condition of any intervention, no significant adverse environmental impact is presumed to result from activity implementation. All staff of the Activity and the sub-Grantees must nonetheless be aware that these *Standard Environmental Conditions* are generic in nature, and that additional potentially significant adverse environmental impacts may be associated with respective interventions. It is the responsibility of WorldFish and the sub-Grantees to monitor and to ensure that significant adverse environmental impacts do not result from the Activity. Measures taken need to be both “practical and appropriate” and are therefore further elaborated in this EMMP to reflect the nature of activities undertaken within the local context.

A wide range of interventions is being anticipated to take place at the diverse physical settings of the ZOI. The following *Standard Environmental Conditions* are to be followed “as practicable and appropriate” for all types of interventions:

- 1) Implement activities in a way that would not convert any PAs nor will aquaculture and agriculture be extended in an environmentally sensitive area.
- 2) Employ strategies to protect trees, watercourses, other plant or animal species or habitats and important historical and archaeological features to ensure the least possible impact on the local area.
- 3) Develop specific procedures for storing topsoil, and for phased closure and reshaping and restoration of the pit when extraction has been completed.
- 4) Minimize disruption to the normal activities of the area by establishing and adhering to timetables for respective interventions.
- 5) Avoid inappropriate machinery and equipment maintenance that can result in the contamination of the sites by grease, oil, and fuels. Place solvents, lubricants, oils, and other semi-hazardous and hazardous liquids over a lined area with appropriate secondary containment in order to contain spillage. Test the integrity of bulk storage tanks and drums and secure valves on oil and fuel supplies. Build appropriate containment structures around bulk storage tanks and materials stores to prevent spillage entering watercourses.
- 6) Build collection channels leading to oil and/or silt traps, particularly around areas used for machine and vehicle washing or fueling. Avoid pollution of waterways with stockpiled materials and cover stockpiled materials, as practicable. Prevent runoff of potentially contaminated water into borrow pits. Minimize the disturbance of, and reduce the spread of, ground contaminants.
- 7) Handle, store, use and process branded materials in accordance with manufacturer’s instructions and recommendations. Remove waste materials from the site and dispose of in appropriate, designated local disposal areas. Minimize the burning of waste materials.
- 8) Avoid banned chemicals (e.g., paint, primers, varnishes, stains, sealant and glazing formulations that contain lead); minimize the use of solvent-based paints, or replace with water-based materials where possible; and avoid the use of asbestos in products particularly in cement, paper; board, sealant and glazing formulations; piping; roofing material; or other materials.
- 9) Water pipes (i.e. Galvanized Iron-Zinc coated) that contain materials which cause corrosion and make the water acidic (because of the presence of lead and cadmium) should not be used if a regular water testing program is not in place. In general, Chlorinate-polyvinyl-chloride (cPVC) pipes will be used.
- 10) Build tanks or other separators for silt-laden material prior to allowing significant

outflow into watercourses. Seal or remove abandoned drains to minimize water contamination.

- 11) Introduce measures to control and minimize the volume of waste on site. Segregate waste which can be salvaged, reused or recycled for other purposes or community use. Recycle wastewater to the extent practicable.
- 12) Bury waste if it cannot be recycled or removed from the site it. Ensure it is down-gradient from drinking water sources such as wells; avoid areas of high water tables; avoid areas where underlying geology makes contamination of groundwater is likely, and line with an impermeable material such as clay or plastic if necessary.
- 13) Renovate the landscape, if soil agitation or any other form of construction takes place, in a way that is appropriate to local conditions as much as is practical. Backfill and/or restore borrow areas and quarries before abandonment unless alternative uses for those sites are planned; recover and replant topsoil and plants as practicable; discuss with local communities the option of retaining quarry pits as water collection ponds to cultivate fish, water cattle, irrigate crops or for similar uses.
- 14) Develop and implement appropriate human health and worker safety measures. Provide workers with appropriate safety equipment; take safety precautions to protect workers and others from injury; provide appropriate latrines for sanitation, and provide for the safe disposal of grey water from or places for bathing and washing. Issues of disease transmission and prohibiting the use of untreated water for human consumption, bathing, and clothes washing should be highlighted with workforce and the surrounding community. Strictly enforce national child labor laws.

ANNEX V: LIST OF APPROVED FISH SPECIES FOR AQUACULTURE AND REPRODUCTION

Pursuant to **Article 9** of the **Fish Hatchery Act, 2010**, and the **Rule 9**, and its subsequent **Schedule 8** (page 9476) of the **Fish Hatchery Rules, 2011**, the Activity will facilitate the reproduction and extension of following fish species:

- 1) Rui
- 2) Catla
- 3) Mrigal
- 4) Kalibaus
- 5) Silver carp
- 6) Grass carp
- 7) Mirror carp
- 8) Bighead
- 9) Black carp
- 10) Mohashol
- 11) Carpio/Common carp
- 12) Sarputi
- 13) Rajputi/Thai Sharputi
- 14) Shing
- 15) Magur
- 16) Koi
- 17) Pabda
- 18) Golsha
- 19) Ayre/Air
- 20) Pangas
- 21) Shol
- 22) Chital
- 23) Bagda (shrimp)
- 24) Golda (fresh water prawn)
- 25) Tilapia
- 26) Bhetki
- 27) Other (if any, specify names)

In order to specify the “Other fishes (# 27)” in the aforesaid list, following native fish species may also be promoted by the Activity, as they (1) have good nutritive value, (2) do not have invasive characteristics, and (3) are being undergone artificial breeding and rearing programs by BFRl and DoF:

- 27.a) Mola and any other SIS
- 27.b) Foli
- 27.c) Kakra/crab (if crablets are from hatcheries)
- 27.d) Bata
- 27.e) Bhagna
- 27.f) Parshe
- 27.g) Kuchia
- 27.h) Meni/Veda

ANNEX VI: LIST OF APPROVED DRUGS, PHARMACEUTICAL PRODUCTS, AND CHEMICALS

The Activity may facilitate using of the following items as they are pursuant to the regulations of both USG (especially by USFDA) and GOB:

- 1) **Chorionic gonadotropin** may be administered as an aid in improving spawning function at a doses of 50 to 510 and 67 to 1,816 IU per pound of body weight for male and female brood-fish, respectively by intramuscular injection. Up to three doses may be administered.
(Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011; and 21 CFR 522.1081: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=522.1081>)
- 2) **Tricane methanesulfonate** may be administered as an aid in fish handling at hatchery at a doses of 15 to 330 mg/l water. If applied, fish cannot be harvested for food within 21 days.
(Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011; and 21 CFR 529.2503: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=529.2503>)
- 3) **Oxytetracycline** may be administered on fish and shrimp/prawn with feed to treat ulcer or bacterial hemorrhagic septicemia. If applied, fish cannot be harvested for food within 30 days. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011; and 21 CFR 558.450: <https://www.gpo.gov/fdsys/pkg/CFR-2005-title21-vol6/pdf/CFR-2005-title21-vol6-sec558-450.pdf>)
- 4) **Sulfadimethoxine** and **Ormetoprim** may be administered on fish to treat enteric septicemia (caused by bacteria) at a dose of 50 mg per kilogram of body weight per day for 5 consecutive days. If applied, fish cannot be harvested for food within 42 days.
(Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011; and 21 CFR 558.575: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=558.575>)
- 5) **Rotenone**, is a Restricted Use Pesticide (RUP) product in USEPA due to its high toxicity to fish. However, rotenone is approved for use in inland culture fisheries but only by trained professionals using appropriate PPE. (Ref. *Bangladesh Programmatic PERSUAP, 2015, page 93*)
- 6) **Sodium thiosulfate** is on the World Health Organization's (WHO) List of Essential Medicines (Ref.: https://en.wikipedia.org/wiki/WHO_Model_List_of_Essential_Medicines)
- 7) **Baking soda** (Sodium bicarbonate)
- 8) **Prefuran** (10% nifurpirinol) may be administered on fish with feed to treat microbial, fin rot, bacterial gill disease, etc. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 9) **Ethylene Di-amino Tetra Acetic Acid** (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 10) **Aquaculture probiotics**: There is growing interest in the use of beneficial bacteria, probiotics ("prolife"), as an alternative strategy to antimicrobial compounds for disease prevention and control in aquaculture. These naturally occurring bacteria exert their beneficial effects on the host by modifying the microbial community associated with the host, by ensuring improved use of the feed or enhancing its nutritional value, or by enhancing the host response towards disease. At the animal level, probiotics improve the growth and survival of fish and shrimp by modifying the host-associated or ambient microbial community. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 11) **Protozoacide** may be applied on pond-water to eliminate protozoa or an agent that so acts. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 12) **Methylene Blue** is effective against superficial fungal infections of fish. The drug may be used as an alternative to **Malachite Green** for the control of fungus when it is known that the fish to be treated are sensitive. Methylene Blue is safe for use with fish eggs and fry for the prevention of fungal infections. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery

Rules, 2011)

- 13) **Vitamin pre-mix/multi-vitamin/vitamin C** may be administered for better growth and survival. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 14) **Tricaine mesylate (TMS, MS-222)**: At this time, it is the only **anesthetics** registered for use on food fish in the U.S. However, many compounds have been evaluated experimentally and some are being used on nonfood fish and in research (Ref.: <https://agrifecdn.tamu.edu/fisheries/files/2013/09/SRAC-Publication-No.-3900-Anesthetics-in-Aquaculture.pdf>). The recommended dosages for fish-bath are 15-50 mg/l for sedation, 50-200 mg/l for induction, 50-100 mg/l for maintenance, and 1 g/l spray directly on the gills of large fish. Fish that could be used as human food and requires a 21 day withdrawal period prior to release of harvest. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011)
- 15) **Spawning Hormones and Inducing Agents** (natural and synthetic):
 - a) **Pituitary Gland (PG), LRH, and FSH**
 - b) **Ovaprim** is a synthetic hormone that contains both the hormone and the dopamine antagonist. It has been tested successfully on a wide range of fresh, salt and brackish water species. Although Ovaprim is costly (almost double the cost of PG) yet it has the advantage of known potency and assured breeding response. Ovaprim is being in ready-to-use form, and has a long shelf life since refrigeration of the solution is not required.
Ref.: <https://www.fda.gov/animalveterinary/developmentapprovalprocess/minoruseminorspecies/ucm125475.htm>)
 - c) **Human Chronic Gonadotropin (HCG)** is widely used as it has an edge over PG mainly because of its easy to acquire, relatively cheap, long shelf-life and of known and consistent potency. HCG alone or in combination with fish pituitary (HCG 70% + PG 30%) has successfully been used to induce breed Indian major carps.
- 16) **Formalin solution** may be administered for control of external protozoa, monogenetic trematodes on finfishes and penaeid shrimp, and fungi on fish eggs. For control of external parasites on finfish, formalin concentration may be up to 250 microliters per liter of the tank- or raceway-water but for up to 1 hour, and 15-25 microliters per liter in earthen ponds. For control of fungi on finfish eggs, apply in constant flow water supply of incubating facilities for 15 minutes with 1,000 to 2,000 microliters per liter. Fish tanks and raceways may be treated daily until parasite control is achieved. Pond treatment may be repeated in 5 to 10 days if needed. Egg tanks may be treated as often as necessary to prevent the growth of fungi. Do not use formalin which has been subjected to temperatures below 4° C, or allowed to freeze. Do not apply formalin to ponds with water warmer than 27° C, when a heavy bloom of phytoplankton is present, or when the concentration of dissolved oxygen is less than 5mg/l. (Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011; and 21 CFR 529.1030; <https://www.gpo.gov/fdsys/pkg/CFR-2001-title21-vol6/pdf/CFR-2001-title21-vol6-sec529-1030.pdf>)
- 17) **Lime** (calcium oxide/calcium hydroxide) is approved by USEPA for aquaculture uses. It is approved for use to sterilize ponds. It also increases the availability of nutrients, and increases pH to buffer against pH fluctuations. (Ref. *Bangladesh Programmatic PERSUAP, 2015, page 93*)
- 18) **Urea**, a nitrogen-release fertilizer, is approved by USAID for agriculture/aquaculture uses. It is approved for use to accelerate phytoplankton production in aquaculture ponds. (Ref.: Fertilizer Financing Guidance: A Mandatory Reference for ADS Chapter 312; <https://www.usaid.gov/sites/default/files/documents/1876/312mad.pdf>)
- 19) **Single/Triple Super Phosphate (S/TSP)**, the phosphorus-release fertilizers, are approved by USAID for agriculture/aquaculture uses. It is approved for use to accelerate phytoplankton production in aquaculture ponds. (Ref.: Fertilizer Financing Guidance: A Mandatory Reference for ADS Chapter 312; <https://www.usaid.gov/sites/default/files/documents/1876/312mad.pdf>)
- 20) **Muriate of Potash (MP)**, a potassium--release fertilizer, is approved by USAID for

agriculture/aquaculture uses. It is approved for use to accelerate phytoplankton production in aquaculture ponds. (Ref.: Fertilizer Financing Guidance: A Mandatory Reference for ADS Chapter 312; <https://www.usaid.gov/sites/default/files/documents/1876/312mad.pdf>)

- 21) **Bleaching powder** (Calcium hypochlorite) is a hazardous substance but at low concentrations (i.e. 0.5% chlorine solution) it is approved by USEPA for use as disinfectants/sterilizers (Ref.: 40 CFR 152.6 – Substances excluded from regulation by FIFRA; <https://www.law.cornell.edu/cfr/text/40/152.6>), and can also be used for emergency disinfection for drinking water (Ref. *Bangladesh Programmatic PERSUAP*, 2015, page 93)
- 22) **Table salt**

ANNEX VII: LIST OF PROHIBITED DRUGS, PHARMACEUTICAL PRODUCTS, AND CHEMICALS

The Activity will not facilitate of using the following items as Feed the Future/USAID only approves items that are pursuant to the regulations of USG, as well as, the host country:

- 1) **Dipterex** cannot be used since its active ingredient (AI), Trichlorfon/Metrifonate, is not approved/registered in Bangladesh, and it is toxic to fish and aquatic organisms. This AI is also not approved by the United States Environmental Protection Agency (USEPA) for use in aquatic environment. (*Ref. Bangladesh Programmatic PERSUAP, 2015, page 96*)
- 2) **Sumithion** contains Fenitrothion as AI. Although it is approved in Bangladesh for agricultural uses but, the AI is not approved by USEPA for aquaculture use because it is a marine pollutant and toxic to fish as it bioaccumulates in the brain, liver, muscle, and blood of exposed fish. (*Ref. Bangladesh Programmatic PERSUAP, 2015, page 96*)
- 3) **Phostoxine**, which contains Aluminum Phosphide (AI), is highly toxic to mammals and human, and thus is not approved for use in aquaculture (*Ref. Bangladesh Programmatic PERSUAP, 2015, page 97*). However, it can be used for fumigation to protect storage commodities at the warehouse (*Ref. Bangladesh Programmatic PERSUAP, 2015, page 151*).
- 4) **Kerosene** and **diesel** are carcinogenic, and thus is not approved for use in aquaculture. (*Ref. Bangladesh Programmatic PERSUAP, 2015, page 97*)
- 5) **POPs** (Persistent Organic Pollutants), mentioned below, cannot be used as Bangladesh ratified the Stockholm Convention:
 - a) Aldrin
 - b) Chlordane
 - c) Dichloro-diphenyl-trichloroethane (DDT)
 - d) Dioxins
 - e) Endrin
 - f) Heptachlor
 - g) Hexachlorobenzene (HCB)
 - h) Mirex
 - i) Toxaphene
- 6) **Stil bine** and its associated salt and ester cannot be used in aquaculture and in the production of fish product. (*Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011*)
- 7) **Steroid** cannot be used in aquaculture and in the production of fish product. (*Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011*)
- 8) **Drugs** specified in the **Attachment 4 of European Commission (EC) Directives 2377/90**, 26 June, 1990 (*Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011*):
 - a) Chloram phenicol
 - b) Chloroform
 - c) Chloropromagin
 - d) Colchicines
 - e) Depson
 - f) Dimetidiazole
 - g) Metronidazole
 - h) Nitrofurantoin
 - i) Ronodagon
- 9) **Medicines** used in the treatment of animals and its residues (*Ref.: Schedule 3 under Rule 11 of Fish Hatchery Rules, 2011*):
 - a) Anti-bacterial substances, salphonamides and quinolans
 - b) Authalminties
 - c) Polychlorinated biphenyl (PCB) and other organo-chlorine compounds

- d) Organo-phosphorous compounds
 - e) Mico toxin
 - f) Dye/ink/pigment
- 10) **Quinaldine:** While it is an effective anesthetic, it is an irritant to fish, has an unpleasant odor, and is a carcinogen, and thus is not approved by the FDA for use on food fish in the U.S.
(Ref.: <https://agrifecdn.tamu.edu/fisheries/files/2013/09/SRAC-Publication-No.-3900-Anesthetics-in-Aquaculture.pdf>).
- 11) **Clove oil:** It is inexpensive and not unpleasant to work with, and thus has been widely used as an anesthetic in fish and crustaceans. However, it is not approved for use on food fish in the U.S.
(Ref.: <https://agrifecdn.tamu.edu/fisheries/files/2013/09/SRAC-Publication-No.-3900-Anesthetics-in-Aquaculture.pdf>).

ANNEX VIII: STANDARD SITE VISIT FORMS

Note: Monitoring Forms will be filled out electronically, and uploaded in the MIS instantly through internet.

Environmental Compliance Monitoring Form – Feed Mills

Date of Monitoring:	<will be filled in automatically by MIS>	Staff ID:	<Insert>
WorldFish Staff:	<will be filled in automatically by MIS>	Designation:	<will be filled in automatically by MIS>
Name of feed mill:	<will be filled in automatically by MIS>		Tracking #: <Insert>
Location of feed mill:	Village: <will be filled in automatically by MIS>	Union:	<will be filled in automatically by MIS>
	Upazila: <will be filled in automatically by MIS>	District:	<will be filled in automatically by MIS>
		GPS Coordinates (Lat. & Long.):	<will be filled in automatically by MIS>
Feed mill License #:	<will be filled in automatically by MIS>		

Scope of Monitoring:

Areas of Inspection	Result*	Remarks
a) Are only the approved types and quality of ingredients and additives being used as specified in the <i>Fish Feed Rules, 2011</i> ?	<Insert>	<Insert>
b) Is the procedures that are mentioned in the <i>Guideline for cleaning, disinfection, and waste management for feed mill</i> being followed?	<Insert>	<Insert>
c) Is the <i>Stock register for ingredients</i> being updated at least once a week?	<Insert>	<Insert>
d) Are the <i>Log sheets for the ingredients and additives used in feed preparation</i> being updated at least once a week?	<Insert>	<Insert>
e) Is the <i>Feed Production and stock register</i> being updated at least once a week?	<Insert>	<Insert>
f) Is the <i>Guideline for feed storage</i> being followed?	<Insert>	<Insert>
g) Is the <i>Guideline for installation, operation, and decommissioning the equipment and material</i> being followed?	<Insert>	<Insert>
Any other observations (including possibility of new environmental threats): <Insert>		

* **Result:** 1=Acceptable; 2=Not Acceptable; 3=Not Applicable; 4=Not Checked

Photo Plate

<insert photo>	<insert photo>
Photo-1: <insert caption>	Photo-2: <insert caption>
<insert photo>	<insert photo>
Photo-3: <insert caption>	Photo-4: <insert caption>

Environmental Compliance Monitoring Form – Feed Dealers

WorldFish Staff: _____ Date of Monitoring: _____
 Name of feed dealer: _____ Designation: _____
 Location of feed dealer: Village: _____ Tracking #: _____
 Upazila: _____ Union: _____
 GPS Coordinates (Lat. & Long.): _____ District: _____
 Feed dealer License #: _____

Scope of Monitoring:

Areas of Inspection	Result*	Remarks
a) Is the <i>Guideline for feed storage</i> being followed?		
b) Is the procedures that are mentioned in the <i>Guideline for cleaning, disinfection, and waste management for feed storage</i> being followed?		
c) Is the <i>Feed stock register</i> being updated at least once a week?		
d) Is the <i>Guideline for installation, operation, and decommissioning the equipment and material</i> being followed?		
Any other observations (including possibility of new environmental threats):		

* **Result:** 1=Acceptable; 2=Not Acceptable; 3=Not Applicable; 4=Not Checked

Photo Plate

<insert photo>	<insert photo>
Photo-1: <insert caption>	Photo-2: <insert caption>
<insert photo>	<insert photo>
Photo-3: <insert caption>	Photo-4: <insert caption>

Environmental Compliance Monitoring Form – Fish Hatchery

WorldFish Staff: _____ Date of Monitoring: _____
 Name of Hatchery: _____ Designation: _____
 Location of Hatchery: Village: _____ Tracking #: _____
 Upazila: _____ Union: _____
 GPS Coordinates (Lat. & Long.): _____ District: _____
 Hatchery License #: _____

Scope of Monitoring:

Areas of Inspection	Result*	Remarks
a) Is only the approved fish species as specified in the <i>B.1 of Annex 3</i> being used for multiplication?		
b) Are only the approved drugs, pharmaceutical products, and chemicals as specified in the <i>B.2 of Annex 3</i> being used for hatching, and at broodstock and nursery ponds?		
c) Is the procedures that are mentioned in the <i>Guideline for maintaining the purity of broodstock</i> being followed?		
d) Is the procedures that are mentioned in the <i>Guideline for cleaning, disinfection, and waste management for hatchery operation</i> being followed?		
e) Are the <i>Log sheets for broodstock assessment ("sampling")</i> being updated at least fortnightly?		
f) Are the <i>Log sheets for broodstock and fry feeding</i> being updated at least once a week?		
g) Are the <i>Log sheets for drugs and pharmaceutical products used in broodstock and nursery ponds, and fry production</i> being updated at least once a week?		
h) Is the <i>Fry Production Log-sheet</i> being updated at least once a week?		
i) Is the <i>Guideline for installation, operation, and decommissioning the equipment and material relating to solar power</i> being followed?		
j) Is the <i>Guideline for installation, operation, and decommissioning the equipment and material relating to water filtration and recycling</i> being followed?		
Any other observations (including possibility of new environmental threats):		

* **Result:** 1=Acceptable; 2=Not Acceptable; 3=Not Applicable; 4=Not Checked

Photo Plate

<insert photo>	<insert photo>
Photo-1: <insert caption>	Photo-2: <insert caption>
<insert photo>	<insert photo>
Photo-3: <insert caption>	Photo-4: <insert caption>

Environmental Compliance Monitoring Form – Demonstration Pond/Plot

WorldFish Staff:

Date of Monitoring:

Name of farmer:

Designation:

Location of farmer:

Village:

Tracking #:

Upazila:

Union:

GPS Coordinates (Lat. & Long.):

District:

Scope of Monitoring:

Areas of Inspection	Result*	Remarks
a) Is only the approved fish species as specified in the <i>B.1 of Annex 3</i> being used?		
b) Were the fingerlings transported in containers with battery-supported aerated-water?		
c) Is the <i>Guideline for polybag-waste management</i> followed?		
d) Are only the approved drugs, pharmaceutical products, and chemicals as specified in the <i>B.2 of Annex 3</i> being used for aquaculture?		
e) Are only the approved crops as specified in the <i>PERSUAP, and its addendums</i> being used?		
f) Are only the approved inputs as specified in the <i>PERSUAP, and its addendums</i> being used for crop?		
g) Are only the procedures as specified in the <i>GAPs</i> being followed for crop production?		
Any other observations (including possibility of new environmental threats):		


* **Result:** 1=Acceptable; 2=Not Acceptable; 3=Not Applicable; 4=Not Checked**Photo Plate**

<insert photo>	<insert photo>
Photo-1: <insert caption>	Photo-2: <insert caption>
<insert photo>	<insert photo>
Photo-3: <insert caption>	Photo-4: <insert caption>

ANNEX IX: IEE: ASIA 17-078

Double-click on the bordered section with the embedded PDF below.

Asia 17-078


USAID | **BANGLADESH**
FROM THE AMERICAN PEOPLE

US Agency for International Development (USAID) / Bangladesh
Initial Environmental Examination (IEE)/Domestic NEPA Action and/or Request for
Categorical Exclusion Facesheet

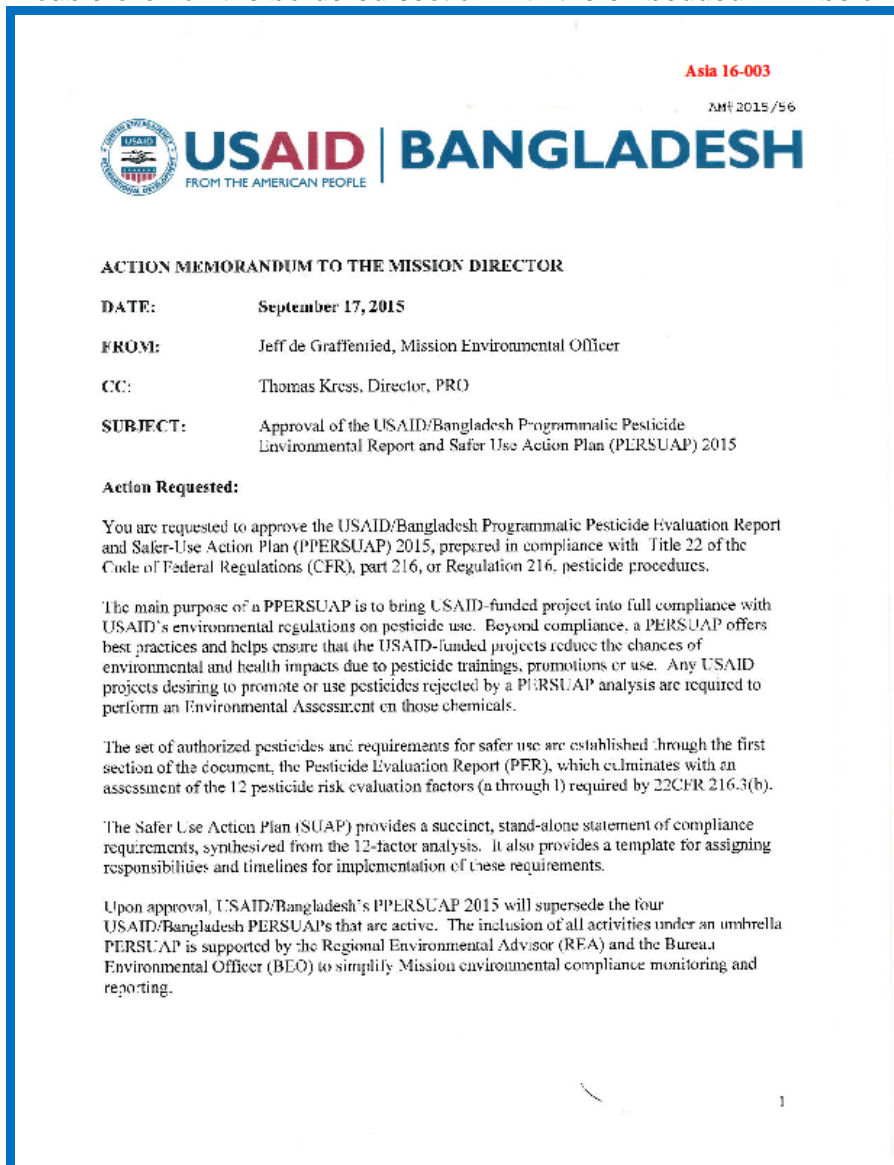
Program/Project/Activity Data:

Activity/Project Title: <i>USAID/Bangladesh Economic Growth and Food Security through Agriculture and Employment Project</i>		Solicitation #: <i>[As assigned by contracting office]</i>
Contract/Award Number (if known): <i>N/A</i>		
Geographic Location: <i>Bangladesh</i>		
Originating Bureau/Office: <i>Bureau for Food Security</i>		
Supplemental IEE:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DCN and date of Original document:
Amendment:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DCN and ECD link(s) of Amendment(s):
Programmatic IEE:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Amendment No.:
Funding Amount: <i>\$250M</i>		Life of Project Amount: <i>\$250M</i>
Implementation Start/End: <i>FY-FY October 1, 2017 – September 31, 2022</i>		
Prepared By: <i>Anar Khalil- Senior Advisor and Muhammad Nuruzzaman, EG Office</i>		Date Prepared: <i>June 15, 2017</i>
Expiration Date (if any): <i>September 31, 2022</i>		Reporting due dates (if any): <i>N/A</i>
Environmental Media and/or Human Health Potentially Impacted (check all that apply): None <input type="checkbox"/> Air <input type="checkbox"/> Water <input type="checkbox"/> Land <input type="checkbox"/> Biodiversity <input type="checkbox"/> Human Health <input type="checkbox"/> Other <input type="checkbox"/>		
Recommended Threshold Determination:		
<input checked="" type="checkbox"/> Negative Determination <input checked="" type="checkbox"/> with conditions <input checked="" type="checkbox"/> Categorical Exclusion <input type="checkbox"/> Positive Determination		<input type="checkbox"/> Deferral <input type="checkbox"/> Exemption <input type="checkbox"/> USG Domestic NEPA action
Climate Change: <input type="checkbox"/> GCC/Adaption <input type="checkbox"/> GCC/Mitigation <input checked="" type="checkbox"/> Climate Change Vulnerability Analysis (included)		
Adaptation/Mitigation Measures: <i>Climate Risk Screening Analysis at the PAD level included in the Attachment 1.</i>		

1

ANNEX X: BANGLADESH PROGRAMMATIC PESTICIDE EVALUATION REPORT & SAFER USE ACTION PLAN (PERSUAP), JULY 2015

Double-click on the bordered section with the embedded PDF below.





U.S. Agency for International Development



Overseas Private Investment Corporation



U.S. Department of State



U.S. Trade Representative



U.S. Department of Agriculture



MILLENNIUM
CHALLENGE CORPORATION
UNITED STATES OF AMERICA
Millennium Challenge Corporation



United States Geological Survey



U.S. Department of Commerce



U.S. African Development Foundation



U.S. Department of the Treasury



Peace Corps



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative