



## Executive Summary

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**ANIMAL KINGDOM FOUNDATION INC.**

# **Fish Welfare Study in the Philippines: The Gap Analysis**

## Introduction

The Animal Kingdom Foundation has embarked on this study to look into how to raise the knowledge and capacities of all the stakeholders of the fish farm industry with regard to fish welfare. This is also part of the advocacy of the AKF to adhere to the One Welfare concept which highlights the interconnections between animal welfare, human wellbeing, and the environment.

One Welfare builds on the One Health concept. One Welfare approach promotes “..the direct and indirect links of animal welfare to human welfare and environmentally friendly animal-keeping systems. Increasing education and awareness will help to establish different ways of working and improve efficiency within local and global networks of those working in animal welfare, human wellbeing, and environmental issues. It will overall support the implementation of sustainable development goals.” (<https://www.onewelfareworld.org/about.html>)

In the present times, the Philippines’ aquatic industry has been plagued with problems due to inadequate practices such as non-monitoring of important parameters including the absence of water quality monitoring systems on most farms highlighting the existing information gap on the true welfare state of farmed fishes. The difficulty in assessing production-specific welfare (Wagas et al, 2020).

Research made in the last 20 years shows that the Philippines’ aqua farm industry is going to suffer more if the following problems are not addressed:

- Overfishing, illegal fishing and habitat destruction combined with increased demand for fish and population growth continue to drive fisheries production into a deeper abyss.” (One Ocean 2000). [http://oneocean.org/fish/the\\_philippine\\_fisheries\\_situation.html](http://oneocean.org/fish/the_philippine_fisheries_situation.html))
- Philippine Fisheries Commission cited the following problems: lack of technical know-how and technical manpower; inadequate transportation, distribution, and refrigeration in the centers of production.; financing; inadequacy of fish seedlings; difficult execution of management due to dual control of freshwater areas (Tampus,2016).
- The lack of science in developing policy, the inadequate participation of stakeholders in decision-making, and the fisheries policy have been shaped by political interests and the voices of the few powerful rather than of the scientists or the many stakeholders whose lives depend on the resource. Fisheries science has played almost no role in how decisions are made in the sector. (Garchitorena, 2020).
- The Philippines needs a comprehensive system or framework which can weave science and management together for better policy that adapts to changes in the fisheries. And the primary users of the resource must be given a voice in decision-making. (Garchitorena,2020)

Recent news reports corroborate these researches:

- Fletcher’s (2021) report stated that the Philippines might produce as many as 1.6 billion milkfish and 1 billion tilapia a year only if the importance and benefits of fish welfare across the entire supply chain are highlighted because welfare does not start and end in fish farms;
- Gomez (2021) reported that civil society organizations have called on the government and the private sectors to implement responsible aquaculture mechanisms that prioritize animal welfare in farmed aquatic animals;
- In a manifesto Opposing House Bill 7853 signed by fisher folks in 2021, it demanded that “instead of altering the heart and spirit of the amended Fisheries Code of the Philippines, we call for the strict and immediate implementation of all its provisions not only to address the prevalence of illegal, unreported, and unregulated fishing but also to ensure the protection and welfare of all sectors in the fishing industry.”

- Wagas et. al(2020) emphasized the need for fish welfare...they stressed that “the welfare of fish impacts biodiversity, human health, and business sustainability.” This fish welfare encompasses the following: business resilience, workers who are happy, a healthy society where food is safe, disease control, a sustainable environment, conservation of healthy local species, better lives for the fish, and marine fish conservation. Wages, et al pointed out, too, that there is an existing information gap on the true welfare state of farmed fishes and the difficulty in assessing production-specific welfare.
- The amount of fish caught from the seas and inland waters has barely increased to keep up with the appetite of a growing population. In southeast Asia, aquaculture contributed 33% of the volume of all fisheries products in 2005. Fifteen years later, aquaculture’s contribution has grown to more than half (54%) of all fisheries products. In this 15-year span, Southeast Asian aquaculture produced a total of 265 million tons of fish products. ( Seafdec, 2022)

With these studies and reports made, it has become imperative to emphasize the need for fish welfare awareness and fish welfare practice among all stakeholders of the aqua farms from the fish farmers, to fish farm workers, to buyers, and from the national government down to the local government units and non-government organizations. Each one needs to be involved actively in all aspects of fish welfare because we are all in one boat in this advocacy; we are all connected, and we all have our roles to fulfill.

## Purpose

The **Fish Welfare Study in the Philippines: The Gap Analysis** by the Animal Kingdom Foundation, Inc. (AKF) has documented the experience of 49 privately owned fish farms in 44 barangays located in two cities and 16 municipalities in the provinces of Batangas, Bulacan, Laguna, Pampanga, Pangasinan, Quezon, Rizal and in two cities in the National Capital Region (NCR). It also documents the experience of heads and representatives of Fisheries and Aquatic Resources Management Councils (FARMCs)<sup>1</sup> from nine municipalities, three fisherfolk grassroots organizations, and two cooperatives that are into aquaculture. The study also interviewed the public sector, represented by 23 respondents from the respective Agriculture Offices and Environment and Natural Resources Office in the covered cities and municipalities.

This study endeavors to provide vital inputs in pursuing national and local advocacy intensive efforts to promote fish welfare where the threshold of the Philippines’ farmed aquatic industry is. This research likewise will serve as a reference not only for future activities and undertaking, but also in pursuit of any effort to raise the capacities of the various players in the aquaculture industry on this largely ignored issue on Fish Welfare. Specifically, this study aims:

1. To identify the knowledge and perceptions of the stakeholders on fish welfare specifically on:
  - a. on fish feeling pain (on ice, method of cultivation and harvesting)
  - b. on fish survivability( with or without human intervention)
  - c. on fish management (quality of feeds, quality of water)

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<sup>1</sup> The FARMCs of Fisheries and Aquatic Resources Management Councils were created by virtue of Executive Order No. 240 issued in 1995 to be composed of representatives of local fisherfolk, among whose primary function is to prepare and recommend the fisheries and aquatic resources management policies and plans for integration into the Local Development Plan.

2. To identify the knowledge and perceptions of the stakeholders on relevant regulations affecting the fishing industry specifically on:

- a. Animal Welfare Act
- b. Fisheries Code
- c. Fisheries Administrative Order
- d. OIE International Standards Aquatic Animal Health Code

3. To recommend actions for the full awareness and knowledge of Fish Welfare among stakeholders.

## The Research Framework

The **Fish Welfare Study in the Philippines: The Gap Analysis** attempts to look at the various contexts (aquatic species being farmed, culture systems), actors (fish farmers, traders, regulators, NGOs, fisherfolks, LGUs), and the complexity of relationships among them.

The Fish Welfare Framework is based on the Development in Context/Ecological Systems Framework (ESF) which was developed in 1977 by Urie Bronfenbrenner. While the ESF highlights the influence of social environments on human development, the Fish Welfare Framework attempts to highlight the roles of specific contexts like species and culture systems and the relationships between the various actors in the aquaculture industry. All these will be determined and analyzed using the following components: Knowledge, Structure, Capacity, Process of Welfare, Functions, and Accountability. These six components are further defined into details or themes presented in the following succeeding diagram.

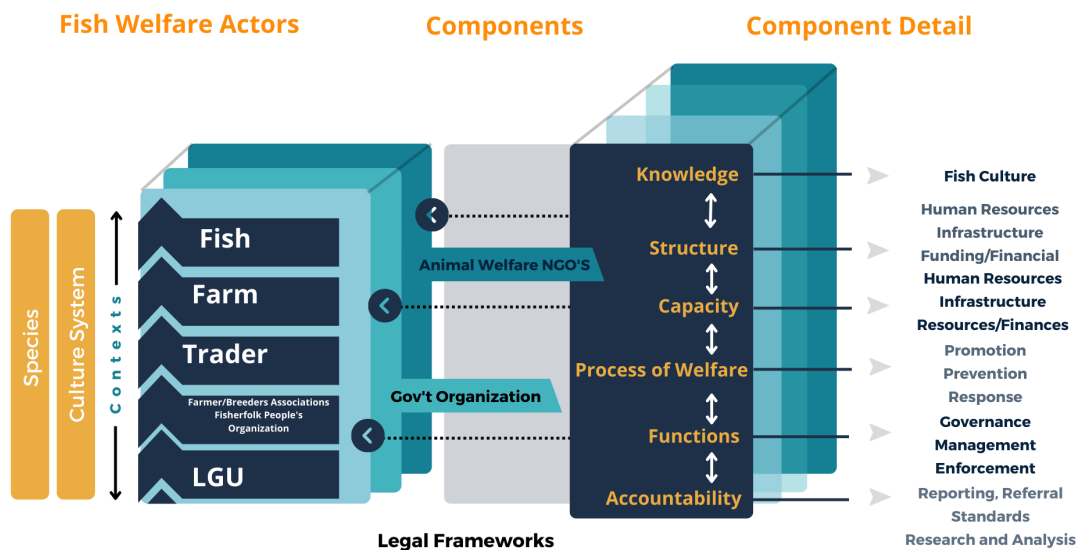


Figure A - Fish Welfare Framework

The Fish Welfare Framework presents the need to look at the contexts of species-specific production systems (fresh, marine or brackish, polyculture/monoculture) and the six aforementioned

components while identifying actors in the economic aspects at the community and local government levels that may be tapped for multidisciplinary collaborations and advocacy work.

## Methodology

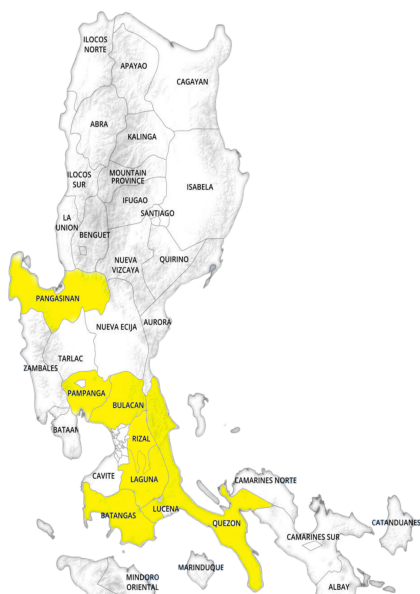
### Sampling and Criteria

The process of sampling began with examining the listing of aquafarms registered with the BFAR and the selection of provinces to be covered by the study. Given the interzonal travel restrictions imposed in September 2021 during the inception stage of the study, the research focused only on Luzon.

The list of species was determined by the research team through the *Fisheries of Statistics of the Philippines (2017-2019)* by the Philippine Statistics Authority, which also provided the selection of provinces, barangays, and farms in Luzon where these species are farmed and triangulated with the list of registered aquafarms with BFAR.

The research also covers aquarium/tropical fish bred for leisure, but given the variety of species, this is considered under one category, placing the total number of species/items covered at eleven. The list of BFAR registered ornamental breeders served as the basis for the selection of respondents. For government respondents, representatives of the City/Municipal Agriculture Offices and City/Municipal Environment and Natural Resources Offices, and the FARMCs were the target respondents.

### The Study Site



There are 49 fish farms in Luzon surveyed (both for edible and ornamental species) located in 44 barangays in 17 municipalities and cities. Specifically, the farms included in the study are situated in the towns of Calatagan, Laurel and Talisay in Batangas; Angat, Bulakan and Hagonoy in Bulacan; Los Baños and San Pablo City in Laguna; Parañaque City and Quezon City in the NCR; Apalit, Lubao, Macabebe and Masantol in Pampanga; Binmaley, Dagupan City and Sual in Pangasinan; Padre Burgos in Quezon; and Binangonan, Cardona, and Jala-Jala in Rizal

Figure B - Map guide with selected areas for the research

- The farms are engaged in both monoculture and polyculture; the aqua farms are engaged either in grow-out only, hatchery-grow outs or hatchery-nursery-grow-outs. One aqua farm owner involved in mud crabs culture said his farm is a “fattening facility.”

- The surveyed aqua farms generally grow 14 edible species: milkfish, tilapia, catfish, grouper, snapper pangasius, carp, seabass, siganids, eel, crabs, tiger prawns, pacific white shrimp, and freshwater shrimps.
- More than half of the aqua farms (53%) get their water supply from natural sources like springs, rivers, and the sea. The sources of water for the fish farms in Bulacan, Pampanga, and Pangasinan are rivers and make use of gates to regulate the inflow and outflow of water time with the natural flow of tidal fluctuations. The aqua farms in San Pablo City, Laguna, procure water from natural springs located around the lakes; the farms in Pampanga use water from the old irrigation system, while the farms in Bulacan get their water supply from the Angat Dam. Pumps bring in water from natural sources, such as the case of aqua farms in Calatagan, Batangas. The farms in Rizal get their water from deep wells. The ornamental aqua farms get their water supply from the local water system; the water is subject to filtering and/or aeration after allowing it to settle for a few days to get rid of chlorine. This is the standard practice among ornamental aqua farms.
- The type of farming, which is basically monoculture, is dependent on fin fish species and geography.

## Profile of Respondents

The study has 86 respondents with their respective profiles:

**Private Sector:** There are 49 respondents who are: owners/operators (33%), farm managers (20%), operators (18%), and owners (10%). The average number of years the respondents have been working in the aquaculture industry is 16, although some have started working at a younger age or at the time of the start of the fish farm.

**Public Sector:** There are 23 respondents from the respective Agriculture Offices of the covered cities and municipalities, and their counterparts from the Environment and Natural Resources Office. The respondents from these agencies include heads of offices (26%), agriculturists (26%), and agricultural technologists (17%).

**NGO Sector:** There are 14 respondents: the heads of the Fisheries and Aquatic Resource Management Council (FARMCs) in the covered areas; officials of two cooperatives and two officials of a fisher folks association. The average number of services among the NGO respondents is 7 years; while 5 respondents have been serving in their respective NGOs for more than 10 years, with one serving for 13 years and another for 16 years.

## Data Collection and Analysis

The tools developed for the **Fish Welfare Study in the Philippines: The Gap Analysis** highlights an experiential learning theory wherein effective learning is seen when a person progresses through a cycle of four stages: (1) having a concrete experience followed by (2) observation of and reflection on that experience which leads to (3) the formation of abstract concepts (analysis) and generalizations (conclusions) which are then (4) used to test a hypothesis in future situations, resulting in new experiences<sup>2</sup>. The team worked on the assumption that there is already a wealth of experience at the level of aquafarms and among various stakeholders working in the aquaculture industry.

<sup>2</sup> Kolb's Learning Styles and Experiential Learning Cycle accessed from <https://www.simplypsychology.org/learning-kolb.html>

Two sets of questionnaires were developed: Set 1 for aquafarm owners, operators, and employees; Set 2 for respondents from relevant government offices at the city and municipal level and representatives of NGOs or POs, including the FARMCs. The tools were tested in mid-October 2021 and finalized by the final week of November, coinciding with the fielding and tools orientation with the AKF team based in Quezon City and tasked to conduct research activities in Batangas, Laguna, Quezon, Rizal, and the NCR, and with local researchers in Bulacan, Pampanga, and Pangasinan. Letters were sent to the Local Chief Executives of the target towns and cities, written in Tagalog since it is the language most understood and used in the target areas. For purposes of this study, the questions and answers were then translated into English. Discussions were conducted face-to-face while observing proper Covid protocols.

Given the need for the research to ensure the safety of the data gatherer and respondents from COVID19, the data gathering activities strictly adhered to the guidelines from the Inter-Agency Task Force (IATF) on COVID19. There were instances wherein the data gathering activity proceeded online through Zoom and Facebook Messenger. There were also instances when the respondents – mainly from the government offices – requested local researchers to leave the questionnaires, which they accomplished at their own pace.

After the questionnaires were answered, the data were collated and used the combination of frequency count, and for the summary of data, Chi-squared was used to test for independence to determine if there is an association between two variables under some classification or categories or if one variable is independent of the other.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where O = observed frequency in the cell

E = expected frequency in the cell

The Friedman test is a test for comparing three or more related samples and makes no assumptions about the underlying distribution of the data. The data is set out in a table comprising  $n$  rows by  $k$  columns.

The Friedman test statistic is:

$$F = \left[ \frac{12}{bk(k+1)} \sum_{i=1}^k T_i^2 \right] - 3b(k+1)$$

For this research, the SPSS version 20 was used to compute the above quantities.

## The Results of the Survey

### 1. Knowledge and perceptions of the stakeholders on fish welfare specifically:

#### a. On fish feeling pain (on ice, method of cultivation and harvesting):

- The majority of respondents believe that fish feel pain because they are animals, and have senses and a nervous system. The fish's reactions to being caught, as seen in their flailing movements, with scales removed, or swimming backward, with mouths opened and breathing on the surface- are indicative of pain. Respondents believe that fish are/or can be hurt during the process of catching or harvesting, especially if illegal means such as electrocution or dynamite blasting are utilized; and, that there are people who do not have “*malasakit*” or compassion towards their fish catches. Fish also feel pain if they are not fed, and have lesions on their bodies. Fish are also stressed when in overcrowded cages.
- The respondents agree that it is better to place the fish in ice slurry than leave them exposed after being harvested since this practice helps the fish retain their freshness, preserve their appearance, and ensure marketability; and, it is one way of making the fish die faster. Other reasons for such practice are: to prevent the fish from jumping which would hurt them more and, to prevent them from rotting after they are caught. Putting the newly harvested catch in ice or ice slurry has been the practice.
- Fish farmers of edible species like crabs, catfish, and tilapia and also those who own aquariums and tropical fish farms sell their fish alive. Ornamental fish farmers put their fish in plastic transport bags with oxygen or in water tanks with aerators.
- The respondents said proper pond management entails keeping the farm pond, rivers, or sea clean and maintaining their cleanliness. Respondents also said that they abide by the aquaculture industry and marine management regulations, aside from handling them with care. A fish farm operator from Rizal said that welfare standards are the answer to lessen fish feeling pain.

#### b. On fish survivability ( with or without human intervention)

- Majority of the respondents generally believe that fish can survive on their own and can take care of themselves as they can feed on natural foods that grow in good water such as algae and plankton.
- Other respondents answered with qualifiers: fish can survive on their own, but this depends on the species and location of the fish; and if the quality of water is good and there is ample natural food. Nonetheless, there are respondents who said that while fish can survive on their own, they still need to be monitored to ensure their condition, especially in controlled environments such as fish pens or cages.
- On the other hand, a few respondents believe fish need human intervention with regards to their needs for good quality and clean water and food in order to thrive. When the fish are placed in cages, they have to be fed and monitored; and the same is true for fingerlings - their cages should be regularly cleaned to be healthy and grow bigger, with a better chance of marketability.

#### c. On fish management (quality of feeds, quality of water)





- Respondents believe that proper and correct management of fish farms is mandatory, be it for edible or ornamental fish. There are requirements that have to be fulfilled to be assured of healthy and viable fish, for a more profitable business.
- Different ornamental fish species require different needs, be it in terms of lighting, pond sizes, or tanks. Ornamental fish farmers have “breeding tanks,” to breed good and healthy fish lineage
- At the core of these findings is the knowledge of proper farm management that includes quality of stocking and harvesting of the farmed fish; and, the care for these fish by providing quality water and feeds.

#### d. Reasons for fish mortality

- The top two reasons fish die are due to the changes in water temperature and salinity. However, there are differences in the ranking for fish mortality causes among the surveyed farms, especially in terms of water temperature and water salinity as this is dependent on the geographical locations of the fish farms.
- The other reasons for fish mortality, presented in the order of ranking, are poor water quality and sudden rainstorms, poor harvesting techniques, overstocking and overfeeding, stress while fingerlings, poor management of the aqua farm, disease, and poor handling.

#### e. On methods of handling fish after being caught:

- The number one technique used is ice chilling only. The second technique is selling the fish alive. The third in rank is a combination of ice chilling and electrical stunning; this is done for the shrimps. Spiking or percussion is ranked four.

### 2. Knowledge and perceptions of the stakeholders on relevant regulations affecting the fishing industry specifically:

#### a. RA8485 The Animal Welfare Act

- A majority (62) of the respondents have knowledge of the RA8485 but it is not enough with regards to its provisions, and only five have good knowledge about the Act. The respondents' knowledge on RA8485 is limited to and associated with dogs.
- In terms of recall of provisions, 26 respondents can remember two provisions, and 25 can bring to mind only one. The provisions the respondents can remember are: Maltreatment of and/or cruelty to animals is illegal; proper care and protection of animals, and Anti-rabies.
- In terms of campaigning for fish welfare, 36 respondents say it is not really difficult to campaign for fish welfare because continuing education of the stakeholders of aqua farms is always made. There are 27 respondents who assert that it is difficult to campaign for fish welfare. There are respondents who did not give any reason for the difficulty of campaigning for fish welfare, nor gave any action to take. Some respondents have recommended continuing education and research, and to conduct *Information dissemination, need to know local standards, such as in crabs, on proper packing and handling*. There are respondents with No idea (7) and no answer (1) at all.
- The majority of the respondents from the three sectors, private, public, and NGO, know and are aware of the term “fish welfare” while 20 do not know the term
- The top source of knowledge of the term ‘animal welfare’ is television news, while others learned about it from their parents, from their experiences, and from watching other people. The others learned from MAO, RHU, and BFAR and from the *Municipio*(municipal). The other

respondents came to know about the term from seminars, and webinars conducted; one said he learned about it in school.

- Almost all of the respondents said that fish welfare is an important topic, and only two said it is not an important topic.
- The majority of the respondents perceive and understand fish welfare as the welfare of fish while being farmed, while being transported, the aspects of the killing of fish for food, and disease control.
- The majority of respondents said that there is “No need to be an expert on fish welfare and this could be made to be understood well.” Of the 29 respondents who said “fish welfare is a topic for experts only” suggested translating the policies to be understood by everyone concerned and staging an awareness or information campaign aside from presenting them in workshops, seminars, and forums.

#### **b. RA8550 The Fisheries Code**

- In terms of knowledge of the Fisheries Code, only 10 have good knowledge of it; and, there are 53 who said “Yes, but with not enough knowledge on its provisions.” Their knowledge of the Fisheries Act of 1998 is limited to the aquaculture industry regulations relating to illegal fishing and the prohibition of the use of dynamites; and, with a few mentioning that it has been amended by RA10654. There are 23 respondents who have no knowledge at all of the Fisheries Code.
- In terms of recall of the provisions of the Fisheries Code, 27 respondents can recall at least one thing about RA 8550; while 23 can, at least, recall two things about RA 8550. Most of those who can recall provisions of RA8550 mentioned that it contains aquaculture industry regulations and marine management and the protection and/or cleanliness of bodies of water aside from the protection of fish and/or not to use any illegal means for fishing.

#### **c. OIE International Standards Aquatic Animal Health Code**

- Of the 86 respondents, 77 do not have any knowledge at all of the Fisheries Code. Only 7 know about the Aquatic Health Code provisions but not enough knowledge, and only two have good knowledge about it.
- Of the 86 respondents, 43 stated that RA8550 and CoPaq is an important topic for the fisher folk to be aware of. However, data also shows that many of them (12) do not have enough knowledge on RA8550 but none at all on CoPaq; and, 15 of the 86 respondents do not have enough knowledge on both. Of the 86 respondents, 15 do not know both RA8550 and CoPaQ; on the other hand, two respondents have good knowledge of the CoPaQ but not enough knowledge on RA8550. Only one has good knowledge on RA8550 and CoPaQ.

## Conclusions

Based on the findings, analysis, and interpretations, the research has concluded the following:

1. The knowledge and perceptions of the stakeholders on fish welfare

- a. Respondents know and perceive that fish feel pain.

In the series of interviews, while the respondents think of the question as amusing, they recognize that indeed fish feel pain which we call, the dawning moment.

- b. Respondents know and perceive that fish can survive without human intervention but since the stakeholders are into the business of aqua farming of edible and ornamental fish, they still have to intervene in taking care of the welfare of their fishes in terms of proper soil management, providing quality water and additional food supplements, aside from the natural food available to them.

2. There are existing regulations that may warrant the protection and promotion of FW such as the Fisheries Code, Code of Practice for Aquaculture, Animal Welfare Act, and OIE, However, these documents remain in the knowledge of policymakers at the national and local levels. they are not translated into a relatable document to the end users... the fishers folks.

3. There exist Fish Welfare practices (stocking density, monitoring of water quality, quality feeds, disease management) present in almost all of the farms interviewed. However, these are not identified by all the respondents as relating to fish welfare.

## Recommendations

The following are the recommendations:

1. There should be capacity building of LGUs, FARMCs/fish cooperatives on Fish Welfare,
2. To create national and community champions and allies among relevant agencies to advocate for Fish Welfare,
3. To develop effective IEC materials on law and issuances and Fish Welfare that are in local languages, and,
4. To produce info-materials using the findings of this study for use in the campaigns on Fish Welfare.
5. To use this study as a basis for the conduct of intensive campaigns for fish welfare and the information-dissemination of the laws and regulations that are pertinent to the aqua farm industries by the concerned government units, be it local or national and the NGO