Department of Agriculture
Bureau of Fisheries & Aquatic Resources

In collaboration with
Food and Agriculture Organization of the United Nations

Project Inception Workshop Report

"Improvement of feeding and feed management efficiency in aquaculture production in the Philippines"
TCP/PHI/3404

Sequoia Hotel, Quezon City
April 22 to 23, 2014

1. Introduction

This report provides an account of the inception workshop for TCP/PHI/3404 "Improvement of feeding and feed management efficiency in aquaculture production in the Philippines". The workshop was held at the Sequoia Hotel, Quezon City on 22-23rd April 2014, and was designed to introduce the TCP project to all the major stakeholders in the aquaculture sector, discuss the project objectives and outcomes, and finalize the project implementation plan. With a view to effectively achieving the project objectives, the project framework was revised at the output and activity levels. The timeframes for the various project activities were also revised. The workshop agenda is presented in Annex A and the itinerary of the post-inception field visit is given in Annex B.

2. Participation

The workshop was attended by 45 participants drawn for government agencies, research institutions, the private sector and FAO. The institutions that were represented included the Bureau of Fisheries and Aquatic Resources (BFAR): BFAR - Inland Fisheries and Aquaculture Division (BFAR-IFAD); BFAR - National Integrated Fisheries Technology Development Centre **(**BFAR-NBFTC); BFAR - Information and Public Relations Group (BFAR – IPRG); the Bureau of Animal Industries (BAI); and the City Agriculture Office, Dagupan City. Research institutions were represented by Central Luzon State University (CLSU) and the Southeast Asian Fisheries Development Centre - Aquaculture Centre (SEAFDEC AQD). A list of workshop participants is presented in Annex C.

The target beneficiaries of the TCP Project comprise:

- Small and medium scale aquaculture producers engaged in tilapia and milkfish farming;
- Feed manufacturers and local feed producers;
- Academes and Fisheries Research Institutions; and
- BFAR and other regulatory Government Departments.

3. The workshop

3.1 Day 1

3.1.1 Opening Speeches

Ms Drusila Esther E. Bayate, Asst. Director for Technical Services, the Bureau of Fisheries and Aquatic Resources, Department of Agriculture (BFAR), Philippines.

Ms Bayate delivered the welcoming speech. On behalf of the BFAR Director Atty. Asis G. Perez, she welcomed the FAO team and workshop participants, and wished them productive discussions. She noted the importance of the aquaculture sector in the Philippines and notably, the problems that famers were experiencing with aquafeeds and feed management. She expressed her hope that the project would successfully address these problems, and assist in improving aquaculture production in the Philippines.

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Mr Rajendra K. Aryal, FAO Country Representative *Ad interim*

Mr Aryal welcomed the delegates and briefly introduced the project. He indicated that the TCP project was a natural continuation of previous work that FAO had been involved with in the Philippines, and that it was aligned to the National Medium-Term Priority Framework (NMTPF) - a collaborative programme between FAO and the Philippian Government that is designed to assist the country in realizing its developmental objectives. He recalled the FAO workshop "On-farm feeding and feed management in aquaculture" that was held in Manila in September 2010, and indicted that as a result of this workshop, the government of the Philippines had requested this TCP project. He was happy that FAO was able to assist with delivering the TCP, and expressed his hope that the project would make a meaningful contribution to aquaculture development in the country. He concluded by wishing the delegates a successful workshop.

Ms Ma. Gracia G. Soriano, Master of Ceremony. The Bureau of Fisheries and Aquatic Resources- Inland Fisheries and Aquaculture Services (BFAR-IFAD).), Philippines.

Ms Soriano welcomed the delegates to the workshop and asked everyone to stand, briefly introduce themselves, and to indicate the institutions that they were representing at the workshop.

Dr Nelson A. Lopez, National Project Coordinator and Chief, the Bureau of Fisheries and Aquatic Resources – Inland Fisheries and Aquaculture Services (BFAR-IFAD), Philippines.

Mr Lopez introduced the TCP programme and provided a synoptic review of the current status of tilapia and milkfish production in the Philippines, and their contribution to the total fish production (Annex D). He contextualized the TCP in terms of addressing the goals of the BFAR Comprehensive National Fisheries Industry Development Plan (CNFIDP, 2006 - 2025), and the country's Medium Term Development Plan (MTDP, 2010-2016). From a sectorial perspective, he described the significance of aquafeeds in aquaculture and their relevance to the developmental priorities of the World Food Summit Plan of Action (1996) and Millennium Development Goals (2015).

3.1.2 Presentations - Project Objectives and Deliverables

Presentation: Project Outputs and Deliverables - Dr Mohammad R. Hasan, Aquaculture Officer, FIRA, FAO HQ, Rome

Dr. Mohammad R. Hasan is the Lead Technical Unit (LTU) Officer for the project and, will provide Technical Support Services (TSS) and backstopping services to the project. He spoke broadly about the

major feed production and feed management issues that would be addressed by the TCP, and provided an overview of the 4 project outputs and the 18 activities that are required to deliver these outputs (Annex E). The project outputs were defined as:

Output 1: Baseline information on feed ingredient supply and availability, nutritional requirements, feed formulation for Nile tilapia and milkfish farms in the Philippines are collected.

Output 2. High quality and cost-effective feed formulations for different life stages (fry, fingerlings and on-grower) of Nile tilapia and milkfish and improved capacities for small- to medium scale feed manufactures to produce safe and appropriate semi-commercial and commercial aquafeeds are developed.

Output 3. Good on-farm feeding practices and feed management strategies are developed/ optimized and government extension workers and farmers are trained

Output 4. Development and promotion of national feed standards for tilapia and milkfish and appropriate institutional and regulatory frameworks for aquafeed (including feed additives and quality standards) manufacturing, quality control and distribution and policy recommendations to the government for supporting the sector development.

Dr Hasan spoke about the need to improve aquafeed manufacturing technologies and feed formulations, and the need to provide training and capacity building measures for the farmers and small-scale feed producers/manufacturers to improve the quality, supply and use of aquafeeds in the country. He highlighted the need to improve feed standards, the strengthening of regulatory and institutional oversight capacity, and the introduction of international best practice in aquafeed manufacturing and the promotion of high quality and safe aquafeeds. He also highlighted the need to improve on-farm feed management practices and feed management strategies that would result in improved feed efficiencies and economic returns to the farmers.

Presentation: Review of the status of production, marketing and farm application of milkfish feeds in the Philippines - Mr Weimin Miao, Regional Aquaculture Officer, FAORAP on behalf of **Ms Arlene de la Vega**, National Consultant

Mr Weimin Miao is the Lead Technical Officer (LTO) for the TCP. Ms Arlene de la Vega has been employed as a National Consultant, tasked with undertaking a baseline survey of the aquafeed production sector in the country. At the time of the workshop, Ms de la Vega had not completed her survey, however, she provided a synoptic report of her findings to date. Unfortunately she was unable to attend the first day of the workshop, and in her absence, Mr Weimin Miao presented her synoptic report (Annex F).

The survey revealed that in 2013, milkfish and tilapia production in the Philippines was 406 000 and 318 000 tonnes respectively, representing respective increases in production of 3.7 percent and 3.18 percent over the previous year. Applying this production data, and using an average feed conversion ratio of 1.5, it was estimated that milkfish feed requirements are 422 037 tonnes/annum (35 170 tonnes/month) and tilapia feed requirements are 283 815 tonnes/annum (23 650 tonnes/month).

The survey revealed that the two main feed types used in milkfish and tilapia farming are compressed and extruded pellet feeds. Extruded feeds are sold either as slow sinking feeds or floating feeds. Premium brands that produce floating feeds were reported as the best quality feeds and commanded premium prices of at least PHP 2.00/ kilo[1] over the sinking feeds. The current market prices for premium sinking and

[1] 1 US$ = 43.7502 Philippine Peso (PHP)

floating feeds are approximately PHP 24.00 to 30.00/kilo respectively, and PHP 21.00 to 24.00/kg for lower quality sinking feeds (lower protein content).

The main issues and constraints to tilapia and milkfish feed production, quality, marketing and feed management were found to be:

- Increasing costs of fishmeal and fish oils. Both local and imported animal protein sources are becoming scarce and increasingly expensive.
- Farming areas affected by typhoons and floods results in erratic local feed ingredient supplies (e.g. copra, rice bran, corn bran) to the feed manufacturing industry. This can negatively affect aquafeed supplies.
- Increased demand for feed from the poultry and pig production sectors increases the demand and price for feed ingredients required for aquaculture.
- High power, fuel, and labor costs.
- A paucity of financing facilities available to farmers makes it difficult to purchase feeds. Increasingly, many feed manufacturers are extending credit to farmers to finance production. Extended credit terms or contract farming are now common practices that require significant capitalization by the feed manufacturing sector.

Presentation: Improvement of feeding and feed management efficiency in aquaculture production in the Philippines – Outputs 1 and 2 - Dr Tom Shipton, International Aquaculture Nutrition and Feed Development Expert, FAO

Thomas Shipton is the International Aquaculture Nutrition and Feed Development Expert. He presented an overview of the activities required to deliver Outputs 1 and 2 of the TCP (Annex G). This included the design requirements for a survey to characterise the status of feed ingredient supplies and availability in the country. He provided a brief overview of the nutritional requirements of the Nile tilapia and milkfish, and an indication on how best to develop a feed database and to formulate feeds for these species. Further, he provided an indication of the types of feeds that would be suitable for Nile tilapia and milkfish farming under the different production technologies currently in use in the Philippines. The need to develop high quality and cost-effective feed formulations for different life stages (fry, fingerlings and on-grower) of Nile tilapia and milkfish was highlighted, as was the need to improve capacities for small- to medium scale feed manufactures to produce safe and appropriate semi-commercial and commercial aquafeeds. He discussed how improvements to the quality of feeds available to farmers could be achieved by improving feed formulations and the identification of new binders to promote pellet stability. He also stressed the need to develop better feed manufacturing practices (BMPs) for small-scale feed manufacturers, and to provide appropriate training to the feed manufacturers and government extension workers.

Open forum discussion- Moderated by **Mr Weimin Miao,** Regional Aquaculture Officer, FAORAP, and facilitated by Mr **Roy C. Ortega,** BFAR-IFAD

During the plenary session a number of issues were raised by the workshop participants that have bearing on project. These issues can be summarized as:

- Dr Mateo (Bureau of Animal Industries - BAI) informed the workshop that National Feed Standards have been developed, and that it was important that any feeds that are developed by the project adhere to these feed standards. A copy of these feed standards needs to be procured from the BAI and adhered to when formulating the new feeds.
- It was noted that a major constraint to the expansion of the tilapia production sector is the poor water quality that is associated with the use of inappropriately formulated feeds and poor feed manage-

ment. It was proposed that a component of the pilot testing of the new feed formulations should address the impact of the feed on water quality parameters.

- It was noted that SEAFDEC is also developing feeds for tilapia and milkfish culture, and thus it is important that the two programmes do not replicate one another.
- Mr David Villaluz (Iloilo Fish Producers Inc.) noted that the commercial feed manufacturers produce their own feed tables that they distribute with their feeds. These feed tables are not standardized, and different manufacturers promote different feeding rates. This causes confusion within the farmer community. The possibility to standardize feed tables was proposed.
- It was noted that some feeds that are being produced by the commercial feed manufacturers are of a poor quality, and it was proposed that the project should ascertain the quality of feeds currently available to farmers, and provide an indication of how the quality could be improved.
- Dr Colloso (SEAFDEC AQD) noted that issues of organic certification are becoming increasingly important in the industry. The possibility of using the TCP programme to develop organic feeds for tilapia farming was raised.
- It was noted that SEAFDEC has a programme that is aimed at improving feed management in the tilapia cage culture sector on Lake Taaal. Furthermore, commercial feed companies are interested in developing extruded floating feeds for these cage farmers. It was noted that the project needs to take cognizance of these interventions.
- It was noted that while there is a need to look at the impact that high feed costs have on the economic efficiency of the farming operations, feed is not the only production cost, and thus surveys that focus on farm efficiencies need to take cognizance of all production costs.
- Dr Westley Rosario (BFAR-NFFTC) noted that to reduce feed costs, there was a need to enable farmers to make their own high-quality cost effective feeds so that the farmers no longer had to rely on the relatively expensive feeds that are supplied by the commercial feed manufacturers.
- It was noted that in order to ensure buy-in from the farmers throughout the country, the project should be seen to be operating across the country and not simply focus on one or selected regions. Furthermore, the need to involve the large scale feed manufacturers was highlighted, as without their participation there were concerns that the impact of the TCP would be limited.
- It was noted that in some areas, there is an increasing trend for the large commercial feed manufacturers to focus on supplying large farms. This can cause supply problems for the small farmers who are deemed too small to be worth supplying to. It was suggested that the project focuses on improving feed supply to these small farms.
- Mr Ruben Reyes (BFAR-NFFTC) indicated that the feeds available to the farmers often contained a high level of fines, indicating poor quality. He indicated that some farmers had considered venturing into feed manufacturing but had been deterred by the high investment costs.
- It was noted that feed management is a serious issue for farmers and the project focus on introducing better feed management practices would have a positive effect on farm productivity.
- The potential for the project to focus on aquaculture policy and introducing government incentives to develop the sector was discussed. Unlike other agricultural sectors, it was noted that the aquaculture sector has not been prioritorised by government agencies, and thus it does not enjoy the same level of government support. The possibility to develop policy recommendations to improve government support to the sector was discussed. In addition, it was recommended that the project also focuses on existing standards and regulations applicable to the aquaculture sector, and specifically, the level to which they are being implemented. Where appropriate the TCP should provide recommendations about how to improve the implementation of existing frameworks.

Mr Weimin Miao and Dr Mohammad R. Hasan closed the Open Discussion Forum on Day 1. They thanked the delegates for their attendance and for providing their inputs into the discussions. They indicated that while not all of the delegates would be present for the second day of the workshop, the con-

cerns that had been expressed during the first day of discussions would be taken into consideration during finalization of the TCP programme.

Meeting closure

On behalf of the BFAR Director, **Dr Lopez** expressed gratitude to the experts, project partners and stakeholders for their active participation in the workshop and in assisting to attain the Inception Meeting objectives. The meeting formally adjourned at 4:50pm.

3.2 Day 2

Presentation: Improvement of feeding and feed management efficiency in aquaculture production in the Philippines – Output 3- Mr Patrick White, Proposed International Aquaculture Production and Management Expert, FAO

Patrick White is expected to be hired as an International Aquaculture Production and Management Expert. Unfortunately he was unable to attend the workshop in person. In his absence, he provided a pre-recorded presentation that was played to the participants (Annex H). He started his presentation with a brief historical overview of aquaculture sector in the Philippines, and provided an indication of the current status of Nile tilapia and milkfish production in the country, the scale of production, the production systems used, and the geographic distribution of the industry. He highlighted the current SEAFDEC/ USAID project that is also focusing on improving aquafeeds and feed management, and warned of the potential for project duplication. He encouraged the workshop participants to ensure that the TCP did not replicate work that was already being undertaken. A review of feed management practices and how different feeding strategies affect farm performance was presented. He provided an indication of how the feed management trails could be designed. He stressed the need to develop feed management tools such as simple feed-back systems to prevent over feeding, and the use appropriate feeding tables. Issues of technology transfer and the development of better feed management practices were discussed, and in particular, he highlighted the need to promote extension networks to provide farmer training in better feed management practices. The presentation was concluded with a review of the key responsibilities and proposed timings for the interventions required to deliver Output 3.

Preview of Inception Issues and comments and discussion on the work plan - Facilitated by **Dr Mohammad R. Hasan** and **Mr Weimin Miao**

The project outputs, activities and timeframes were discussed by the workshop participants and a revised project framework developed (Annex I).

Post inception workshop field visit - Facilitated by **Dr Nelson A. Lopez**, National Project Coordinator

The itinerary for the five day field visit was discussed (Annex B). The field visit started with a visit to BFAR National Freshwater Technology Centre (BFAR-NFFTC), Science City of Munoz, where the group was hosted by Mr Ruben Reyes (OIC) and reviewed Nile tilapia and freshwater prawn (*Macrobrachium rossenbergii*) culture technologies, a tilapia selective breeding and cryopreservation programme, and vermiculture and integrated tilapia/rice culture production systems. Adjacent to the BFAR-NFFTC facilities is the Freshwater Aquaculture Development Centre, Department of Animal Sciences, Central Luzon State University (CLSU). The University operates a commercial scale feed mill, which while no longer operational, was visited. The Department of Animal Sciences has a nutrition laboratory, and so it was felt appropriate to visit the center to see if it was possible to collaborate with them, and use their facilities during the project. The visit was concluded with a dinner that was hosted by CLSU president, Dr Ruben Sevilleia, and personnel from the Department of Animal Sciences.

In order to address the milkfish culture issues and identify possible culture sites for the pilot trials, it was suggested that the team visit the BFAR National Integrated Fisheries Technology Development Centre (BFAR-NIFTDC, Dagupan City). At the centre, the group was hosted by Dr Westly Rosario (Centre Chief). BIFAR-NIFTDC is currently researching milkfish, rabbit fish, seabass, freshwater prawn culture technologies. As the project is likely to work in the Dagupan area, it was recommended that the mayor of Dagupan City (Ms Belen Fernandez) and President of the Milkfish Producers Association, Dagupan City (Mr Eduardo Maramba), and selected private sector milkfish farms were also visited and included in the itinerary. Visits to some of the small feed manufacturers in the region were also undertaken.

A visit to Panabo Mariculture Park and Tagabuli Mariculture Park in Davao was also undertaken as this enabled the project team to review milkfish cage culture operations and determine whether the project could undertake the milkfish cage culture work in the area. While in Davao the team also visited the BFAR Regional office XI, the BFAR-RFTC in Panabo City and the Aces Organic Farm where an operation of a small-scale feed mill was observed.by the mission.

Annex A: Workshop Agenda

Department of Agriculture
Bureau of Fisheries & Aquatic Resources

In collaboration with
Food and Agriculture Organization of the United Nations

Project Inception Workshop

"Improvement of feeding and feed management efficiency in aquaculture production in the Philippines (TCP/PHI/3404)
Sequoia Hotel, Quezon City, April 22 to 23, 2014

AGENDA		
Day 1: 22 April 2014		
9:00-9:15	**Welcome Remarks**	**Ms Drusila Esther E. Bayate** Assistant. Director for Technical Services
9:15-9:30	**Opening Remarks**	**Mr Rajendra K. Aryal** FAO Country Representative *Ad interim*
9:30-9:45	**Introduction of Guests**	**Ms Ma. Gracia G. Soriano** Master of Ceremony
9:45-10:00	**Project Background & Objectives**	**Dr Nelson A. Lopez**, Chief, IFAD and NPC, TCP/PHI/3404
10:00-10:30	***Break***	
10:30-11:00	**Project Output & Deliverables**	**Dr Mohammad R. Hasan** Aquaculture Officer, FIRA, FAO HQ, Rome
11:00-11:45	**Results of Rapid Assessment**	**Mr Weimin Miao** on behalf of **Ms Arlene Dela Vega,** Project National Consultant
11:45-12:15	**Presentation on Outputs 1 and 2**	**Dr Tom Shipton,** Project International Consultant, FAO
12:15 – 13:30	***Lunch break***	
13:30-14:00	**Presentation on Outputs 1 and 2 (continued)**	**Dr Tom Shipton,** Project International Consultant FAO
14:00-16:00	**Open Forum Discussion**	**Mr Weimin Miao (Moderator)** Regional Aquaculture Officer, FAORAP **Mr Roy C. Ortega (Facilitator)** IFAD, BFAR
16:00-16:15	**Wrap-up and Closing Remarks**	**Mr Weimin Miao and Dr Mohammad R. Hasan**
Day 2: 23 April 2014		
Project Team Meeting/Workshop (see separate programme agenda)		**Dr Mohammad R. Hasan (Chair)** **Dr Nelson A. Lopez (Co-Chair)** **Mr Weimin Miao** **Project Consultants** (Dr Tom Shipton and Ms Arlene Dela Vega) **BFAR Project Staff** **FAO Manila Staff**

BFAR-FAO/TCP/PHI/3404
PROJECT TEAM MEETING/PLANNING WORKSHOP
Sequoia Hotel, Quezon City, 23 April 2014

PROVISIONAL WORKSHOP PROGRAMME/AGENDA

TIME	AGENDA	ACTIVITIES/EXPECTED OUTPUT-OUTCOME	REMARKS
0900-1000	Video presentation on Output 3		Mr Patrick White
1000-1100	Preview of Inception Issues/ Comments and Open Forum/ Discussions	Categorized/prioritised issues/problems/constraints in aquafeeds and feed management for tilapia/milkfish farming	Facilitated by Dr Mohammad R. Hasan
1100-1200	Discussion on work plan/arrangement	Tasking for project consultants/ planning of timelines of activities/programming of project deliverables	Facilitated by Mr Miao Weimin
1200-1330	LUNCH BREAK		
1330-1615	Discussion on work plan/arrangement	Final agreements on consultants tasking; timelines and submissions of deliverables	Facilitated by Mr Miao Weimin and Dr Mohammad R. Hasan
1615-1630	Wrap up and closing remarks		Dr Mohammad R. Hasan
1630-1650	Preview/finalisation of post inception field visits	Briefing on travel itinerary/ activities of project team field visit	Dr Nelson Lopez
1650-1700	Other matters, end of the workshop	Administrative arrangements/ other concerns	Dr Nelson Lopez

Annex B: Itinerary and Activities of Post-Inception Field Visits

POST-INCEPTION FIELD VISITS
FAO/TCP/3404
Itinerary of Activities
24-29 April 2014

Date/Day/Time	Itinerary/Activities	Remarks
24 April (Thursday)		
0800-1130	Travel from Manila to BFAR-NFFTC, Muñoz, Nueva Ecija.	Overnight at Muñoz, NE
1300-1800	Introduction and visit to BFAR-NFFTC and CLSU-FADC facilities (tilapia and freshwater prawn (*Macrobrachium rosenbergii*) culture technologies, tilapia selective breeding and cryopreservation programme and vermiculture), visit to integrated tilapia/rice culture production systems. Visit the Freshwater Aquaculture Development Centre, Department of Animal Sciences, Central Luzon State University and visit to a feed mill of CLSU.	
25April (Friday)		
0800-1100	Travel from Muñoz to Dagupan City, Pangasinan.	Overnight at Dagupan City, Pangasinan
1300-1800	Introduction to activities BFAR-NIFTDC, Bonuan Binloc, Dagupan City, Pangasinan and visit its facilities (milkfish, rabbit fish, Asian seabass and freshwater prawn culture technologies in cages/fish ponds); visit to Philippine Bamos Centre, meeting with the mayor of Dagupan City to discuss milkfish pond, cage and pen farming issues.	
26 April (Saturday)		
0800-1000 1000-1200 1300-1600 1700-1800	Travel from Dagupan City to Pampanga. Visit to Maracamba Milkfish Farm for meeting with the President of the Milkfish Producers Association, Dagupan City. Visit the Pagupan Milkfish Processing Plant (BFAR-NIFTDC). Visit AL Farm, Pampanga (striped catfish and North African catfish) and visit small-scale feed mill (Quick Grow Feed, Pampanga). Return to Manila.	Overnight in Manila
27 April (Sunday)		
0700-1100 1300-1700	Travel from Manila to Davao City. Visit Panabo RFTC Mariculture Park, Davao, to review milkfish cage culture operation. Visit ACES Organic Farm and small-scale organic feed mill.	Overnight in Davao City
28 April (Monday)		
0900-1700 1800	Visit BFAR Regional Office XI, Davao. Visit to Tagabali mariculture park (Baraugay) to review cage culture of milkfish in Tagabali Bay. Return to Manila.	Overnight in Manila
29 April (Tuesday)		

AM PM	Discussion meeting on future plan of action Departure for Rome	Mohammad R. Hasan and Tom Shipton

BFAR = Bureau of Fisheries and Aquatic Resources; NFFTC = National Freshwater Fisheries Technology Center; CLSU: Central Luzon State University; FADC = Freshwater Aquaculture Development Centre NIFTDC = National Integrated Fisheries Technology Development Centre; RFTC = Regional Fisheries Training Centre, Panabo

Annex C: List of Participants

Project Inception Workshop

"Improvement of feeding and feed management efficiency in aquaculture production in the Philippines"
TCP/PHI/3404

Sequoia Hotel, Quezon City
April 22 to 23, 2014

Sl.	Name	Affiliation	Contact no.	E-mail
BFAR				
1	Ms Drusila Esther Bayate	Assistant Director, Bureau of Fisheries and Aquatic Resources (BFAR)	455-9493	
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3	Mr Nelson Lopez	National Project Coordinator, Inland Fisheries and Aquaculture Division (BFAR-IFAD)	+9209799918	nlopez_8550@yahoo.com
4	Dennis Togonon	BFAR		
5	Lea Myr Sobrepeña	BFAR-IFAD		
6	Christopher Enaje II	BFAR-IFAD		
7	Michael Jastillena	BFAR-IFAD		
8	Ms Ma. Gracia Soriano	BFAR-IFAD		
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15	Percival Ecito	BFAR		
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26	Elsie Calinap	BAI	9282837	
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Local Government Units				
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Academic/Research Institutions				
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Annex I: Revised Work plan of the Project (April 2014 – March 2016)

OUTPUTS/ACTIVITIES	YEAR 1												YEAR 2											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Output 1. Baseline information on feed and feed ingredient supply and availability, nutritional requirements, feed formulation for Nile tilapia and milkfish in the Philippines are collected.																								
Activity 1.1: Review of feed and feed ingredient supply (imported/local): availability (seasonality), quality/composition, cost and distribution, current aquafeed production capacity, supply and demand, and policy dispensation (taxation, imports) in the Philippines.																								
Activity 1.2: Prepare a database of locally available feed ingredients and their nutritional composition through literature search, field survey and/or laboratory analysis.																								
Activity 1.3: Review/ survey of nutritional requirement and feed formulation for different life stages (fry, fingerlings and on-grower) for Nile tilapia and milkfish.																								
Activity 1.4: Review of existing formulations and manufacturing practices by small- and medium-scale feed manufacturers for tilapia and milkfish.																								
Output 2. High quality and cost-effective feed formulations for different life stages (fry, fingerlings and on-grower) of Nile tilapia and milkfish and improved capacities for small- to medium scale feed manufactures to produce safe and appropriate semi-commercial and commercial aquafeeds are developed.																								
Activity 2.1: Based on the information from the activities under output 1, modify existing feed formulas used by small- and medium-scale feed manufacturers for different life stages (e.g., fry, fingerlings and on-grower) for tilapia and milkfish based on best available knowledge and locally available feed ingredients using linear programming or Excel-based available software. This activity will also include the selection and inclusion levels of appropriate binders to be used to increase the water stability of pellets.																								
Activity 2.2: Test the modified feed formulations against the existing feed formulations for different life stages in laboratory and through farmers' participatory trial under field conditions for growth, feed conversion and economic efficiency. Among others, the modified feed formulations should look into the efficacy of appropriate binders and pellet types (e.g., floating, sinking and extruded) (Responsible Institutions: **BFAR-NFFTC: tilapia; BFAR-NIFTDC/NBATRC: milkfish)**																								
Activity 2.3: Development of Better Management Practice guidelines/ manuals for aquafeed manufacturing and feed formulation based on the information col-																								

lected from the Output 1 activities.																							
Activity 2.4: Provide farmers and government extension worker training in better management practices (BMP) for aquafeed manufacturing and feed formulation.																							
Output 3. Good on-farm feeding practices and feed management strategies are developed/ optimized and government extension workers and farmers are trained.																							
Activity 3.1: Collection of baseline information on type of feed, on-farm feeding and feed management practices (technical and economic) and related constraints for Nile tilapia and milkfish through the questionnaire surveys with the farmers.																							
Activity 3.2: Develop better management practices (BMP)/good aquaculture practices (GAqP) guidelines/manuals for on-farm feeding and feed management strategies (e.g., feeding rate, feeding frequency, feeding duration, monitoring of feed usage and management tools such as simple feed-back systems) including processing, handling and storage at the farm level.																							
Activity 3.3: Organize workshop on BMP/GAqP guidelines/manuals with farmers and finalize the training materials.																							
Activity 3.4: Provide farmers and government extension workers training and application in BMP/GAqP for on-farm feeding and feed management.																							
Output 4. Development and promotion of national feed standards for tilapia and milkfish and appropriate institutional and regulatory frameworks for aquafeed (including feed additives and quality standards) manufacturing, quality control and distribution and policy recommendations to the government for supporting the sectoral development.																							
Activity 4.1: Review the quality standards for aquafeeds that are generally used for tilapia and milkfish in the country and prepare/compile a set of standards for aquafeeds based on the information available in the country and overseas taking into account the nutritional requirements of the species, availability of local feed ingredients and the cost of the feed produced.																							
Activity 4.2: Review the current legislative, policy and management dispensation for animal/aquafeed manufacturing and distribution with reference to the commonly adopted international best practice, and revisions to policy and regulatory frameworks to promote the production of safe, cost-effective and nutritionally appropriate aquafeeds.																							
Activity 4.3: Depending on the outcomes of Activity 4.2, develop/revise policy and regulatory frameworks for aquafeed manufacturing, and clarify institutional mandates, roles and responsibilities.																							
*Activity 4.4 :*Develop policy recommendations to the government for supporting																							

the sector development through stakeholders' consultation																								
Activity 4.5: Organize a national workshop to review and agree on the feed standards compiled, prepare feed standard implementation guidelines and discuss the institutional roles, responsibilities, and mandates for managing the aquafeed manufacturing sector. Develop outline and agreement on the required changes to the policy and management dispensation.																								
Project coordination and management																								
Inception workshop																								
Terminal workshop																								
Dissemination planning																								
Final reporting																								
Project Terminal Statement																								