



PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Adapting to Climate Change
Responsible Department: Aquaculture Department
Total Duration: 2016-2020
Funding Sources: AQD
Estimated Budget for 2020: USD 26,988

1. INTRODUCTION

Climate change is already happening. There is little doubt that global warming is occurring and at a greater rate than previously predicted. The recent extreme weather disturbances like more frequent and stronger typhoons, long dry spells resulting to droughts, frequent heavy rains resulting to severe flooding are some of the phenomena that are linked to climate change. These changes are projected to impact broadly across ecosystems and economies, increasing pressures on all livelihoods and food supply chains, including those in the fisheries and aquaculture sector. The future food supply will be a central issue as food resources come under greater pressure, and the availability and access to fish supplies will become an increasingly critical development issue.

Climate change is a compounding threat to the sustainability of aquaculture development. Impacts occur as a result of gradual warming, the increasingly acidity of the oceans and associated physical and chemical changes as well as from frequency, intensity and location of extreme climatic events. How these changes affect the aquaculture organisms in general, the different aquaculture systems and structures, the various support systems to aquaculture operations, and to the fish farmers in the region are highly vulnerable since they are dependent on their aquaculture operations for food and income. Urgent adaptation measures are required in response to the threats to food and livelihood provision due to climatic variations.

2. PROJECT

1.1 Goal /Overall Objectives

The overall goal of the program is to help ensure sustainability of aquaculture amidst the expected impacts of disturbances in the culture environment brought about by climate change/global warming.

1.2 Outcomes and Expected Outputs

- (1) Scientific information on the effects of increasing temperature and acidity, as well as other perturbations in the culture environment brought about by climate change (CC) on the different cultured species (reproduction, early development, recruitment and performance during culture including susceptibility to diseases), the different natural food organisms used for broodstock and seed production, natural pond productivity, the occurrence of diseases, and on the mangrove ecosystem
- (2) Information on feed ingredients that can potentially replace fish meal and fish oils in feeds for cultured species
- (3) Identification of CC-resilient species
- (4) Development and promotion of CC-resilient practices
- (5) Establishment of early warning systems that will enhance the resilience of the aquaculture sector

1.3 Project Description/Framework (*for total duration of the project*)

At present, there is no activity that is directly listed under the Climate Change Program. However, several activities under the other Departmental programs also address the objectives

of this program. Moreover, information on the impacts of climate change on aquaculture is incorporated in all SEAFDEC/AQD training courses.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Although there is no activity that is directly listed under the Climate Change Program at present, several activities under the other Departmental programs also address the objectives of the Climate Change Program.

Project/Activity Title	Duration	Remarks
The studies on the effects of temperature and salinity on the reproduction of copepods that are potential food during seed production, effects of salinity and pH on growth of seaweeds and growth of green algae used in rotifer culture, comparing the effects of water temperature on the mating performance of captive and wild stocks of shrimp broodstock, and the effect of abrupt salinity fluctuations on the early recruitment of sandfish also address CC issues.		
The past and current activities on the evaluation of potential feed ingredients from various sources (<i>e.g.</i> industrial, agricultural and fish processing by-products) as replacement for fish meal and fish oil help address constraints of diminishing supplies of fish meal and fish oil in light of the expected impacts of climate change on global fisheries resources. For example, based on previous work on alternative ingredients, a low-fish meal feed (1-2% fish meal) for tilapia and milkfish is now being field tested. Information on nutrient profiles of these ingredients can be added into the Regional Feed Ingredients Database. These initiatives contribute to overall resilience of the aquaculture sector in the region.		
Ongoing studies on persistent and emerging diseases (white spot syndrome, acute hepatopancreatic necrosis diseases, enterocytozoon hepatopenaei, nervous necrosis virus, tilapia lake virus, as well as other viral, bacterial, and parasitic diseases), as well as development of measures to prevent and control disease outbreaks (<i>e.g.</i> vaccination, immunostimulation, greenwater culture) likewise address climate change issues. The formulation of policy recommendations as well as development of guidelines for the establishment of an early warning and response system for disease outbreaks based on the outcomes of the Regional Technical Consultation on the said issue help improve capacity in dealing with disease outbreaks in the region. This system, can be linked to other initiatives like the warning system for harmful algal blooms or fish kills to contribute further to building resilience to the impacts of climate change.		
The current initiatives promoting community-based resource enhancement and aquaculture-based community livelihood programs also improve the resilience of coastal communities, one off the most affected sector of society, to the impacts of climate change.		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Continue to incorporate climate change-resilient practices in studies conducted in AQD as well as in training and information materials		

4.2 Expected Outcomes/Outputs

The program is expected to generate and integrate scientific information which relates to the regulation and preparation of the industry, fish farmers, and other stakeholders to the effects and impacts of climate change.