VIEWS TOWARDS SUSTAINABLE ENVIRONMENT ON GLOBAL WARMING MITIGATION: SILVER POMPANO STUDY OF JBLFMU-MOLO

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ABSTRACT

The present study was conducted to determine the views on sustainable environment towards global warming mitigation by employing the Silver Pompano as a mariculture study of JBLFMU-Molo, Iloilo City, Philippines. This study employed descriptive the quantitative-qualitative method of collecting data. Respondents of the study were the faculty members of the university who were engaged in the mariculture project of the university. Results revealed that the mariculture project is an attempt to deal with the environment and global warming mitigation issues, opportunity to engage in the global warming mitigation activity like planting mangroves around the pond, to deal with particular species of fish; sources of global warming mitigation according to the perception of the respondents are the following: news from media, lectures/talks from international and national seminars/conferences, school teachers / instructors / environmentalists, family members, friends, and personal observation; the perceived causes of global warming problems were due to man's act of negligence, weak implementation of environmental-protection policies by the concerned agencies, insufficient knowledge of the constituents involved, and natural occurrences; some of the respondents were not engaged in this activity; respondents have been engaged in environmental initiatives/activities aside from the Silver Pompano Mariculture activity towards global warming mitigation endeavours such as: tree planting program, information and education on global warming, solid waste management information drive, and energy conservation activity; respondents were motivated by the following reasons: belief, desire to help, and concern for the environment; respondents wanted to become "members only" in any of the activities towards sustainable-environmental global warming issues. Silver Pompano Mariculture opens opportunities for learning environmental issues and problems.

Keywords: *Sustainable environment, mariculture, Silver Pompano, and global warming mitigation.*

1. INTRODUCTION

The Philippine is a biodiversity hotspot and mega diversity area vulnerable to climate change. Climate change is expected to exacerbate the various stresses facing the different ecosystems and large populations of many species of the Philippine archipelago. Marine species could be lost due to the synergistic effects of climate change and habitat fragmentation (Lasco, 2010; Peras, et al. 2008). Moreover, the study of Perez (2010) stressed that the climate change phenomenon is likely to change the world landscape as well as the composition of the lives that presently dwell upon it.

Responses to climate change have been traditionally organized in the attempts of reducing the risks and improving society's resilience, increase climate variability, and long term climate changes (Medrano, 2010; Chou, 2010; Baasco (2009). These things were supported by Medrano (2010), stating that adaptation to climate change is not a technical challenge, but one that involves society in its broadest sense. The major role of the society is very vital to address problems on global warming and climate change because society is composed of learned individuals.

In the study of Tumala (2009), it was stated that advocates of environmental and ecological concerns should organize a crusade intended for global warming mitigation activities that have relationship with nature. These activities should bring change in human behaviour in order to lessen the collective impact of the natural environment. It was mentioned in the study that to protect the environment, there has to be willingness to adopt responsible environmental behavior among the constituents of the community. In the same vein, the study of Tan (2009) strongly cited that environmental education is a tool in creating the needed change. Mitigation is identifying the cause of the changing condition. After identification of the problem, action based on the cause is very important.

Sustainability does not simply mean whether something can last. It addresses how particular initiatives can be developed without compromising the development of others in the surrounding environment, now and in the future. It enables people to adapt to and prosper in the increasing complex environment. Sustainability involves a way of thinking that is integrative, holistic, and ecological (Hargreaves & Fink, 2003).

Another indicator of successful global mitigation management is the collaborative effort. Mirasol and Itaas (2008) suggested that collaborative efforts to achieve good environmental management shall be pursued among academic, non-government organizations (NGOs), and local government units (LGUs). As a maritime university, most of the initiatives and activities on environment geared towards collaboration with different stakeholders, especially LGUs.

In response to the call of resolving constraints in global warming, the maritime university, specifically JBLFMU-Molo embarked in this mari-culture study. This investigation brought opportunities to the faculty members and students to experience the essence of

dealing with global warming mitigation issues and problems. Furthermore, it enabled the faculty members and students to explore and commune with the environment and experience the effect of global warming to the marine-pelagic species of fish known as Silver Pompano.

The Silver Pompano is an Indonesian marine finfish and scientifically known as Trachinotus blochii, Lacepede. It is a pelagic and active species that is easy to domesticate and culture in tropical marine waters. The Silver Pompano belongs to the Carangidae (trevally and jacks) and lives in the coral reef areas of less than 7 meters depth (Juniyanto, Akbar, and Zakimin, 2008). It lives in the open sea and is found in the Atlantic, Indian and Pacific oceans. Juvenile Silver Pompano are commonly found in sandy areas or near sandy-clay estuary water. At the juvenile stage they tend to group together, becoming solitary as adults (Juniyanto, Akbar, and Zakimin, 2008). Sand molluscs and other invertebrates are the main natural food of this fish (Perez, 2010). It was introduced from Taiwan, China because it is the most popular species cultured in Taiwan, but it is also found in Indonesian waters. It takes 3 years for the fish to mature as broodstock (Juniyanto, Akbar, and Zakimin, 2008). As the fish grows fast and fetches a good market price it has a good potential for aquaculture in the Asia-Pacific. This particular species of fish enabled the faculty members to establish mariculture fishpond at Villa Corazon, Nueva Valencia, Guimaras, Philippines. This study of JBLFMU-Molo offered opportunities to the students and faculty members to engage in the sustainable environmental global warming mitigation activities.

2. CONCEPTUAL FRAMEWORK

The present study included independent variables consisting of respondent-related factors such as: age, gender, and classification. Moderating variable included the Silver Pompano mariculture study of JBLFMU-Molo. The dependent variable was the views towards sustainable environment on global warming mitigation.

3. THEORETICAL FRAMEWORK

The present study was anchored on the study conducted by Pareja, Buenaventura, and Eusebio (2009) titled “Global Warming Mitigation Initiatives through Sustainable Opportunities and Challenges of the One Million Trees and Beyond: Project of De La Salle, Philippines.” This study emphasized that dealing with global warming mitigation initiatives need a learning by doing approach, collaborative activities, involvement of educators, and community partnership. These are the indicators of activities leading towards sustainable environment on global warming mitigation.

Another framework employed in this study was derived from the study titled “Slowing Global Warming: Mitigation Strategy for the Developing World” conducted by Pachauri and Barathan (2010). The framework focused on mitigation strategies. These

strategies suggested the need to recast environmental strategies in order to mitigate climate change, keeping in mind that such obviously reflect different ecological, development and cultural realities, and agenda for problem solving. The advocates stressed that the tools of assessment and techniques of analysis need to be placed in more holistic frameworks in response to global warming and climate change. In the light of the identified frameworks on global warming mitigation, this study was conceived by the researchers to determine the different issues and views on sustainable environment global warming mitigation among the faculty members and students who were involved in the Silver Pompano Mariculture study of JBLMFU.

5. STATEMENT OF THE PROBLEM

The present study determined the Silver Pompano as a mariculture study of JBLFMU-Molo and views on sustainable environment towards global warming mitigation. To understand the study, the following questions were advanced:

(1) What are the ideas of the respondents about Siver Pompano study in relation to sustainable-environment global warming mitigation?

(2) What are the environmental problems observed by the respondents in their participation in the Silver Pompano mariculture study of JBLFMU-Molo as an entire group?

(3) What are the sources of environmental global warming information shared by the participants in engaging in the Silver Pompano Mariculture study?

(4) What are the causes of the environmental problems as perceived by the respondents in joining with the mariculture study?

(5) Are the respondents engaged in the ecological, environmental-friendly and sustainable-global warming mitigation initiatives?

(6) What are the groups that influenced the respondents to the practices of environmental-sustainable global warming mitigation initiatives?

(7) What are the sustainable initiatives conducted by the respondents to help mitigate the problems in global warming?

(8) What are the dominant motivating reasons in joining this sustainable environmental global mitigation activities/initiative of maritime university?

(9) What are the types of involvement engaged by the respondents in this sustainable environmental global warming issue?

(10) What are the roles preferred by the respondents in addressing the sustainable-environmental global warming mitigation activities/initiatives?

(11) What are the qualitative views of the respondents about the sustainable environmental global warming mitigation?

6. SCOPE AND LIMITATION OF THE STUDY

The scope of the present study was to determine the Silver Pompano as a mariculture study and views on sustainable global warming mitigation among the faculty members and students at JBLFMU. It further ascertained the profile of the respondents who are involved in the

project at Villa Corazon, Nueva Valencia, Guimaras, Philippines.

7. MATERIALS AND METHOD

This study employed the descriptive quantitative-qualitative method of collecting data. Quantitative method is explained by (Alimen, 2010) by stating that by mystery and expressiveness of numbers, what is inexpressible can be expressed, indescribable can be described, and what is reasonable to expect can be predicted, or a logical conclusion to a series of events can be inferred. Statistics is a language that can speak where other tongues are mute. Words cannot express the concepts that have been reserved for eloquence and expressiveness of statistics alone.

This study employed the quantitative method by employing appropriate statistical tools to describe and determine views on sustainable environmental global warming mitigation that were used as qualitative information, views, and ideas that warrant the results of this study.

Aside from the quantitative method, the present study also considered the role of qualitative mode of investigation. The researchers also utilized qualitative method because it is endlessly creative and interpretive. The researchers were not just left with the fields and mountains of empirical materials and then easily write up their findings. Qualitative interpretations are constructed because the researchers created a field text consisting of field notes and documents for the field (Plath and Sanjek, 1990 as cited in Alimen, 2010).

8. RESPONDENTS OF THE STUDY

Respondents of the study were maritime seafarers/instructors and students who had been involved in the Silver Pompano Mariculture Project of JBLFMU (Table 1). Data are shown in Table 1.

Table 1
Distribution of the Respondents

Category	Frequency	Percentage
A. Entire Group	75	100
B. Age		
Above 41 years old	29	39
21-40 years old	26	34
20 & below years old	20	27
Total	75	100
C. Gender		
Male	41	55
Female	34	45
Total	75	100
D. Classification of Respondents		
Student	29	39
Faculty	46	61
Total	75	100

9. DATA-GATHERING ISNTRUMENT

The data-gathering instrument contained ten (10) open-ended items on the "Silver Pompano Mariculture Study and Views towards Sustainable Environment Global Warming Mitigation." This data-gathering instrument consisted of qualitative questions on the activities, practices, beliefs, preferences, ideas, and views on sustainable environment on global warming mitigation. Maritime faculty members were utilized as respondents and were involved in the environmental project. They were interviewed with regards to environmental campaign-activities towards global warming mitigation.

10. QUANTITATIVE STATISTICS

The appropriate quantitative statistics used in this study were frequency count, percentage, proportion, and rank. No inferential statistics was employed in the study.

11. RESULTS AND DISCUSSION

The ideas of the respondents about the Silver Pompano study in relation to environment and global warming mitigation are stated in the following statements: (1) the Silver Pompano (Trachinotus blochii) mariculture was an attempt to deal with the environment and global warming mitigation issues (39, 50%), (2) it unveiled the principle of ecological-sound marine culture through understanding of natural ecosystem such as natural inflow of energy and resources (f = 15, 20%), (3) opportunity to engage in the global warming mitigation activity like planting mangroves around the pond (f = 11, 15%), (4) it dealt with this particular species of fish that is believed to have promising potential in the midst of climate change and global warming problems (f = 6, 10%), (5) it presents relationship between DO and CO2 (f = 4, 5%).

It is simply shown that the respondents perceived the study as a way to study the environment and other factors related to global warming mitigation. Silver Pompano is a suitable candidate for marine finfish aquaculture in the environment because it can tolerate water quality problems, easily adapt to the environment, and can grow fast.

Waste management is perceived as an environmental problem by the respondents in the Silver Pompano study. According to the respondents, there is a need to look into the system of the generation, collection, storage, transport, separation, processes, treatment, and disposal of solid wastes dump in the sea.

11.1 Sources of Global Warming Mitigation as Perceived by the Respondents

In this particular section of the study, the sources of global warming mitigation according to the perception of the respondents are the following: (1) news from media (f = 20,27%), (2) lectures/talks from international and national seminars/conferences (f = 14,19%), (3) school teachers/instructors/environmentalists (f = 12,16%), (4) family members (f = 11,15%), (5) friends (f = 10,13%), and (6) personal observation (f = 8,10%).

11.2 Causes of Global Warming

The respondents identified the perceived causes of global warming problems as the following: (1) man's act of negligence (f = 25,33%), (2) weak implementation of environmental-protection policies by the concerned agencies (f = 21,28%), (3) insufficient knowledge of the constituents involved (f = 15,20%), (4) natural occurrences (f = 14,19%).

11.3 Response in Dealing with Environmental-Friendly Global Warming Initiatives

The majority of the respondents (f = 55,73%) in the study were doing environmental-friendly global warming activities and some of the respondents (f = 15, 20%) were not engaged in this activity. Very few of them (f = 5,7%) were not certain if they were really conducting environmental-friendly global initiatives or activities. The result is very favorable with the study of Milan (2010), who mentioned that there is an urgent need in our country to train future leaders who will work to ensure the sustainability of our life support system. The result is a positive indicator that the respondents of the present study are potential environmental leaders and have the characteristics to look at environment problems in the light of their own experiences and moral values, committed to leverage their areas of expertise to realize sustainable development in their profession and private lives, can exercise leadership in fulfilling social responsibilities, are protective and restorators of the environment, and promoters of sustainable activities.

11.4 Groups that Influenced the Respondents to Practice Environmental-Global Warming Initiatives

The different groups that influenced the practice of environmental-friendly global warming initiatives according to rank: (1) members of the family (f = 18, 24%), (2) school teachers/instructors (f = 15,20%), (3) mediamen (f = 12,16%), (4) church members (f = 11, 15%), (5) non-government organizations (f = 10,13%), and (6) local government units (f = 9,12%). The data simply show the significant role of family members in persuading or influencing individuals to engage in environmental-global warming mitigation initiatives. This may be because of the characteristics of the Filipino families as being caring, trusting each other, understanding, and closely-bonded whether in happiness or in sorrows. The second significant group is school teachers/instructors. This is true when dealing with the protection of nature and environment. Teachers are always in the front line in advocating sustainable-ecological environmental warming mitigation activities. The media are the next group because of their capability to disseminate the information and news in their respective stations.

11.5 Environmental Initiatives Participated by the Respondents

The respondents of the study revealed that they have been engaged in environmental initiatives/activities aside from the Silver Pomapano Mariculture towards global warming mitigation endeavours. These are the following activities: (1) tree planting program (f = 26, 35%), (2) Information and education on global warming (f = 19,25%), (3) solid waste management information drive (f = 16,21%), (4) energy conservation activity (f = 14,19%).

11.6 Reasons that Motivate in the Involvement at Sustainable Global Warming Activities

The results revealed that the respondents were motivated by the following reasons: (1) belief of the importance of environment (f = 30,40%), (2) want to help (f= 24,32%), and (3) concern (f = 21,28%). Most of the respondents cited that they "believe it is important" to get involved in the sustainable-environmental global warming. This simply means that most of the respondents are persuaded by the importance of the issue on global warming. These sustainable-environmental global warming issues are the "truth" of the present time, which if not properly given attention will bring traumatic impacts and effects to all, especially to environment-loving people.

11.7 Roles of the Respondents in the Global warming issues

One of the organizers is the second reason (f = 23,31%), and the least is the chief organizers (f = 20, 26%). Respondents thought that to become the chief organizers would mean they could not relax anymore, they would have so many things to do, and this entails responsibility and accountability. Therefore, they shun from becoming members to be the major players. They are satisfied to become one of the organizers or initiators. Although some of them confessed that they have the expertise and capabilities. To become front liners, they need ability, time, and expectation to do the necessary things towards the attainment of global warming mitigation efforts. This role becomes even more pronounced when they ensure accountability towards environmental safety and sustainable-environmental management practices.

11.8 Types of Involvement Wanted by the Respondents

The results of the study revealed that most of the respondents wanted to involve in the "planning" (f = 45, 60%) of sustainable-environment global warming, some of the respondents wanted to be involved in "implementation" (f = 20,27%), and only few wanted to be involved in "recruitment" (f = 10,13%).

11.9 Views of Respondents on Silver Pompano towards Mitigating the Effect of Climate Change

In engaging with this study, the respondents learned the following views of sustainable environment on global warming mitigation:

It opens opportunities for learning the following: (a) disadvantages in fishing in the open sea during erratic weather conditions, (b) sea encroaching of the coastland

resulting to salt water intrusion, and (c) more dams and water catchments are being constructed to buffer changing rainfall patterns;

The Silver Pompano is suitable to cultivate, adaptive to the tropical marine waters of the Philippines, as the temperature increases due to global warming;

The fish can tolerate temperature up to 31 degree centigrade and increasing salinity from 30-32 ppt, few of the effects of global warming;

Aquaculture might lessen the effects of climate change if programs are created and consumption of aquaculture products is promoted;

Patronize produce from the sea and man-made aquatic ecosystems rather than depending on industries that help escalate the amount of CO2 and other greenhouse gases in the atmosphere;

Promising potential in the aquaculture industry even with the threats of climate change;

Mariculture as economic system is part of the larger natural system, while the ecosystem provides protection of the farm/pond from natural storm surges;

Enables to understand the essential of free-flowing water that would flow through the system to mitigate extreme heat brought by global warming;

Effects of variable factors that would interplay with environment such as sediment, pollution, weather, and metabolic wastes;

12. CONCLUSIONS

Based on the findings of the present study, the following conclusions were advanced:

(1) The ideas of the respondents about the Silver Pompano study in relation to environment and global warming mitigation are stated in the following statements: the Silver Pompano mariculture as an attempt to deal with the environment and global warming mitigation issues, unveiled the principle of ecological-sound marine culture through understanding of natural ecosystem such as natural inflow of energy and resources, opportunity to engage in the global warming mitigation activity like planting mangroves around the pond, to deal with particular species of fish that is believed to have promising potential in the midst of climate change and global warming problems, and the relationship between DO and CO2 .

(2) Most of the respondents engaging in the project observed the following environmental problems: global warming/extreme heat, oxygen depletion, air/water pollution, water siltation, and waste management.

(3) Sources of global warming mitigation according to the perception of the respondents are the following: news from media, lectures / talks from international and national seminars / conferences, school teachers / instructors / environmentalists, family members, friends, and personal observation.

(4) The respondents identified the perceived causes of global warming problems as the following: man's act of negligence, weak implementation of environmental-protection policies by the concerned agencies, insufficient knowledge of the constituents involved, and natural occurrences.

(5) The majority of the respondents in the study were doing environment-friendly global warming activities, while some of the respondents were not engaged in this activity. Few of the respondents were not certain if they were really conducting such initiatives or activities.

(6) The different groups that influenced the practice of environment-friendly global warming initiatives according to rank: members of the family, school teachers/instructors, mediamen, church members, non-government organizations, and local government units.

(7) The respondents have been engaged in environmental initiatives/activities aside from the Silver Pomapano Mariculture activity towards global warming mitigation endeavours such as: tree planting program, information and education on global warming, solid waste management information drive, and energy conservation activity.

(8) The respondents were motivated by the following reasons: belief, desire to help, and concern for the environment.

(9) Most of the respondents wanted to become "members only" in any of the activities towards sustainable-environmental global warming issues. Some of the respondents wanted to be "organizers" and few opted to become chief organizers.

(10) The respondents wanted to involve in the "planning" when it comes to sustainable-environment global warming, some of them wanted to be involved in the "implementation," and only few wanted to be involved in the "recruitment" process.

(11) Silver Pompano Mariculture opens opportunities for learning the following: (a) disadvantages in fishing in the open sea during erratic weather conditions, (b) sea encroaching of the coastland resulting to salt water intrusion, and (c) more dams and water catchments are being constructed to buffer changing rainfall patterns.

13. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations were presented:

(1) Sustain the Silver Pompano Mariculture study in order to have more faculty members and students understand the effect of global warming and to suggest more activities to mitigate the ill effect of the climate change.

(2) Encourage more individuals to get involved in any activities on global warming so that more resources will be drawn.

(3) Conduct more conferences and seminars on global warming mitigation advocacies.

(4) Education on global warming mitigation of concerned individuals shall be considered by the government and private sectors in their strategic management plan.

(5) Add more activities on global warming mitigation projects so that more people will be involved.

(6) Design more global warming mitigation activities so that more members of the family, school teachers/instructors, mediamen, church members, non-government organizations, and local government units will be involved.

(7) Request more tree planting activities, information and education on global warming, solid waste management information drive, and energy conservation activities in school and communities.
(8) Sustain the respondents' belief, desire to help, and concern for the environment by giving of awards and recognition.
(9) Encourage interested individuals to become also "organizers" and "leaders" when environment global warming activities are needed.
(10) Involve government officials in the "planning" when it comes to sustainable-environment global warming, "implementation," and "recruitment" process.
(11) Use Silver Pompano Mariculture to give more opportunities for learning sustainable-environmental global warming mitigation education.
(12) Parallel studies shall be conducted to study other parameters that lead to more conscientious environmental global warming mitigation concepts.

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