AQUACLIMATE TECHNICAL BRIEF

Vulnerability and Adaptation to climate change on Catfish farming: Stakeholder Analysis in the Can Tho Province, Vietnam

Issue No. 1

Overall, stakeholders perceived climate change as a threat to aquaculture in general and catfish farming in particular. Though farmers have started to adapt to the extreme weather events, their socio-economic context makes them vulnerable to climate variability. The stakeholders' priority is to improve adaptive capacity by strengthening the current culture systems, producing good quality fry, funding support in the event of losses, training and supporting small scale farmers with necessary resources.

Vulnerability and Adaptation of climate change with a focus on Catfish culture systems: Stakeholder Analysis in the Can Tho Province, Vietnam

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Abstract

Stakeholders including catfish farmers in general expressed that climate change is a serious threat and needs to be addressed in an integrated manner. The main changes they observed were: shift in weather patterns, higher temperatures, early rains, floods, saline water intrusion and frequent typhoons. Suggestions from farmers to address extreme weather events included, producing good quality fry, developing new culture systems, building dykes, livelihood diversification, training and awareness workshops and financial support to farmers. Sustaining catfish production in the Can Tho Province is crucial for the large number of farmers who are dependent on it for their livelihoods. Stakeholders are willing to co-operate to address future threats from climate change. The intention to co-operate may be strengthened by improving the existing institutional and policy frameworks.

Fact box

The Mekong Delta of Vietnam (MKD) has a high potential for development of both Agriculture and Aquaculture. Catfish (*Pangasius Spp*) farming has developed rapidly in Vietnam from zero production in 1996 to 850,000 tonnes, valued at USD1.27 billion in 2007 (FAO 2007). It is Vietnam's largest aquaculture sector constituting about 39% and 28% of the weight and value of the nation's aquaculture production.

The vast majority of catfish produced in Vietnam is stripped catfish known locally in Vietnam as "ca tra" (*Pangasianodon hypophthalmus*). The catfish farming area on the Mekong Delta falls within the jurisdiction of nine provincial administrations of which An Giang, Can Tho, Dong Thap and Vinh Long are the most important. The majority of catfish farming is conducted in earthen ponds at very high density.

However, the delta region is highly vulnerable to various problems, especially climate changes and extreme weather events. The present technical brief is part of a study being undertaken in Can Tho province in the MKD to study the impacts of climate change on aquaculture. Stakeholder analysis suggests that the most severe problems are from changing weather patterns, early rains, higher temperatures, floods, typhoons and salt water intrusion due to sea level rise. At the same It is dominated by small scale farmers who are vulnerable to changes in the climate and extreme weather events.

Introduction

Vietnam's topography, climate and long coastline makes it particularly vulnerable to climate extremes and natural disasters. Analysis by Dasgupta et. al. (2007) suggests that Vietnam is one of world's top five most vulnerable countries to sea level rise and the most vulnerable to climate change impacts in South East Asia. In 2006-2007, Vietnam experienced typhoons, floods and droughts in an unprecedented manner causing severe losses to property and infrastructure. Both, agriculture and aquaculture and the livelihoods they support were severely impacted by the extreme weather events.

Mapping impacts and vulnerability, develop adaptation strategies at the national and local levels, strengthening stakeholders' capacity and institutions to manage risks from the climate change, are now a matter of urgency. This cannot be done without actively involving stakeholders and understanding stakeholder perceptions towards climate change. AQUACLIMATE project will put emphasis on stakeholder participation in all phases of the project through various methods including stakeholder workshops, focus group meetings and key stakeholder interviews. This will enable mapping of stakeholder experiential knowledge and development of effective adaptation strategies.

Stakeholder Analysis

"Stakeholder analysis can be defined as an approach for understanding a system by identifying the key actors or stakeholders in the system, and assessing their respective interest in that system" (Grimble et al. 1995, pp. 3–4). The importance of stakeholder analysis in understanding the complexity and compatibility problems between objectives and stakeholders was emphasized by Grimble and Wellard (1996). According to Pretty *et.al.* (1995) and Chambers (1997) stakeholder analysis is closely associated with participatory approaches and is often seen as a tool for effective management of natural resources through stakeholder participation.

Fig. 1 Plenary session at the workshop

There are many dimensions and aspects to stakeholder participation. Participation does not mean involving everybody in all decisions at all times, but rather to ensure that different interests can best be represented in different phases and forums of the multi-stakeholder process.

In Can Tho, the multi-stakeholder participation was initiated by organizing a Stakeholder Workshop (43 participants representing 15 agencies) and two Focus Group meetings (10 participants each) from 18-21 June, 2009, in Can Tho province of Vietnam (Figure 1). Key managers Department of Agriculture and Rural Development, Department of Fisheries Protection, Can Tho and Catfish Hatchery, Club, Catfish Culture Organization; representatives from scientific and extension agencies; and farmers' organizations from the area related to Catfish farming participated. "Facilitated Group Discussions" during the stakeholder workshop encouraged active participation and were very useful to map the stakeholder opinions, views and priorities.

At this first workshop the participants identified the most serious extreme climate events, impacts on catfish farming, possible adaptation measures and agencies that should be responsible for implementing the adaptation

measures. The participants' discussions led to a good overview of the current challenges and future strategies to address threats to catfish farming due to extreme climate events.

The workshop also provided a platform for:

1. Introducing AQUACLIMATE project to the stakeholders in Can Tho province
2. Exchange of perspectives between stakeholders about climate change and impacts on aquaculture
3. Promoting awareness of stakeholders about the ongoing climate change related projects in the region and possible synergies
4. Exploring possibilities for institutional synergies and co-operation with stakeholders in the AQUACLIMATE project
5. Establishing a stakeholder panel that will be the reference group for AQUACLIMATE project in the next 2-3 years for close interaction and developing scenarios

FACILITATED GROUP WORK

Methodology

In order to map the differences in perceptions related to climate change stakeholders were divided into three groups of 13-14, based on their occupation. The different groups were:

- Group I – Mostly Catfish farmers.
- Group II – Dominated by managers from various government agencies
- Group III – A mixed group consisting of representatives from ancillary commercial companies, scientific staff and other stakeholders

Each group was assisted by a facilitator and a translator to guide the discussions. During the discussions, the group members sat in smaller sub groups of 3-4 stakeholders each (Figure 2). This was to facilitate active participation of all stakeholders in the discussions. Each sub group was given different color cards to write down the extreme climate events, the corresponding impacts and the adaptation measures that were further grouped and ranked by stakeholders based on the importance and severity (Figure 3). The stakeholders later identified the most relevant agencies that should be responsible for implementing the measures and the time scale (Figure 4).

Fig. 2 Participants in group discussions

OUTCOMES

Farmers group

Farmers identified irregular weather patterns, higher temperatures, early rains, floods, salt water intrusion and typhoons as the most serious climate events impacting catfish farming. More incidences of fish diseases due to changes in weather patterns and flooding seems to be the main concern of the farmers, besides reduced area for catfish production caused by flooding and saline water intrusion. According to their past experiences, flooding brings about a significant change in water quality and turbidity, which they attribute as the main reason for disease outbreak.

Some of the adaptation measures that farmers were practicing to address the climate change impacts included:

- Adding lime and salt to maintain pH of water and prevent disease outbreak

- Adjusting crop calendar to avoid seasons with salt intrusion.
- Increasing the height of dykes as part of the annual pond maintenance.

Not all farmers were able to mobilize the additional investments to take up the necessary measures in time. More details will be presented and analyzed when the results from the farmers surveys will be made available.

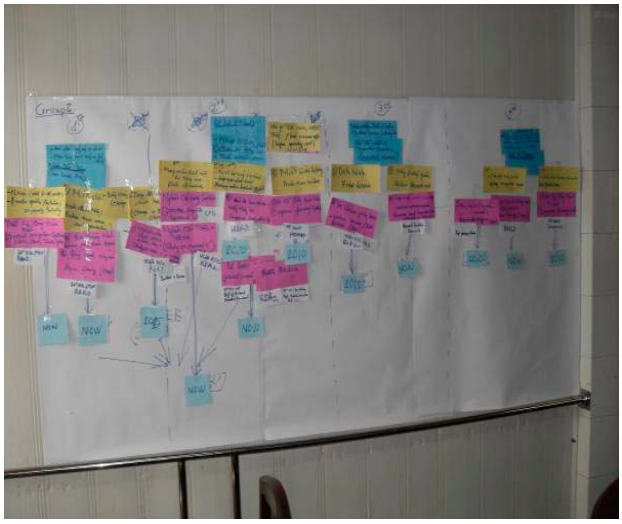

Fig. 3 Mapping stakeholder perceptions

Managers group

The managers perceived sea level rise as the most serious threat from climate change effects. According to them, it results in salt water intrusion specifically into areas where the Mekong tributaries are closer to the sea, thereby, reducing the area for aquaculture. The group felt that increase in salinity as a result of sea water intrusion will affect the biological characteristics of the freshwater species in the Mekong River.

Managers, like farmers, perceived flooding as a serious threat to catfish farming, caused by intense rainfall leading to fish diseases that significantly reduces the production and income of farmers. Frequent flooding increases incidences of the destruction of water supply channels.

Seasonal change (change in seasonal pattern i.e. early rains and floods, and higher summer temperature) was seen by all the three groups as a threat, causing fish diseases and reduced growth rate. All the three groups attributed fish diseases and reduced growth specifically to flooding and bad water quality. Typhoons were also seen as a threat that destroys the water supply channel systems and causing serious losses in production.

One stakeholder mentioned that a study is being conducted rearing fish at 30 ppt salinity. However, problems encountered include: slower growth rate, lower fish quality and higher cost of production.

Mixed stakeholder group

The main concern in the group was the increase in temperature and water quality change leading to fish stress and disease, reduced growth rate, white to yellow color flesh in the fish and increased production costs. Changes in the rainy season pattern and stormy weather were also seen as a threat.

Similar to the managers, the mixed group of stakeholders viewed sea level rise and changes in water flow leading to reduced areas for catfish culture and reduced water quality as one of the major climate change concerns that needs to be addressed.

Some of the adaptation measures already in practice as observed in the group were**:**

- Using chemicals to prevent white flesh from turning to yellow color
- Using probiotics to address water quality problems, and changes in culture system
- Treating disease outbreaks with vaccination and antibiotics
- Reducing stocking density, improve feed quality

Stakeholder suggestions for future

1. Both farmers and managers would like to see an improvement in the irrigation supply canal system to bring freshwater to the pond area in the long term.

2. Managers felt a need:
- for improvement of the farming and building dykes to protect farms from floods
- for developing effective vaccines and drugs that can treat the diseases

- for improving the quality of the fingerlings and make them available to farmers.
- zoning aquaculture areas
- more research on suitable species that can be grown in saline water.
- training of farmers to promote awareness and improve adaptive capacity of farmers.

Fig. 4 Mapping stakeholder perceptions

The Department of Agriculture and Rural Development in Can Tho is currently organizing 20 SQF 1000 training workshops to catfish farmers training courses in 2009

3. The mixed stakeholder group felt a need for:

- Selective breeding to address the problems of reduced fish growth rate (Sang et. al., 2007)
- Improving technology and farm management to control production costs

In general, stakeholders expressed a need for defining "small scale aquaculture". This is important in the context of climate change, where vulnerability and adaptability are closely linked to the scale and socio-economic status of the farmers. AQUACLIMATE will try to address the problems of small scale aquaculture in specific, and thus will provide a definition in the course of the project. Some of issues identified in the preliminary stakeholder analysis will be followed up by the AQUACLIMATE project group and further detailed analysis of the issues will be carried out.

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The Technical Brief series communicate the results from the project into practical and useful information for stakeholders, especially scientists and managers.

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About AQUACLIMATE
AQUACLIMATE is a three year project funded by the Ministry of Foreign Affairs, Norway, through the Royal Norwegian Embassy, Bangkok, Thailand.

Title of project: Strengthening Adaptive Capacities to the Impacts of Climate Change in Resource-poor Small-scale Aquaculture and Aquatic Resources-dependent Sector in the South and South-east Asian Region

Start date of project: March 2009 Duration: 36 months