Vulnerability and adaptation to climate change for catfish farmers in the Mekong Delta: Policy and institutional adaptation measures

Policy brief

Feeding in an intensive pangasius catfish pond.

Policy recommendations

- SET UP STANDARDISED ENVIRONMENTAL MONITORING AND WEATHER FORECASTING SYSTEMS: Timely information to farmers on water flow and water quality issues through standardised environmental monitoring and early weather warnings on extreme weather events will help catfish farmers to plan their activities properly and take necessary actions as needed, reducing risk and damage to farms significantly. Provincial Governments should be responsible in each province for implementing this measure supported by a national policy introduced by the Ministry of Agriculture and Rural Development (MARD).

- DESIGN AND IMPLEMENT TRAINING AND CAPACITY BUILDING COURSES ON CLIMATE CHANGE IMPACTS: This is to be done in two steps, first train selected scientific extension officers. The extension officers in turn should be made competent to train catfish farmers. The training should be conducted at province level for extension officers and at commune level for farmers. The Department of Agriculture and Rural Development (DARD) should be responsible for organising and implementing the training, designed in cooperation with the local universities and research institutes.

- PROVIDE ACCESS FOR CREDIT AND CROP INSURANCE TO SMALL SCALE CATFISH FARMERS: Easy access to credit and crop insurance is important for small scale farmers and can cover losses to farms in the event of droughts, storms, floods and other extreme events. Timely access to credit is also necessary to repair and restart farming activities after losses due to extreme weather events and natural disasters and will improve the farmers' adaptive capacity. Weather-based crop insurance for agriculture is currently being discussed within MARD. The DARD should cooperate and request private insurance companies and banks to provide crop insurance for catfish farmers.

- STRENGTHEN COORDINATION AND COOPERATION BETWEEN STAKEHOLDERS: A well-coordinated body at the provincial level will be useful to improve planning and implementation of climate change adaptation measures, pull resources from different departments together and avoid duplication of effort. MARD should be responsible for introducing such coordination under the new Action Plan Framework on Adaptation to Climate Change for the Agriculture and Rural Development Sector, Period 2008 – 2020. To begin with, a working group with representatives from various relevant departments should be set up at the provincial level under the supervision of DARD for initiating such cross-sectoral coordination for climate adaptation.

- INCREASE RESEARCH FUNDING TO ADDRESS CLIMATE CHANGE IMPACTS ASSESSMENT AND ADAPTATION: Priority research issues include a long term breeding program to develop new strains of catfish that can tolerate higher temperature, salinity and adverse water quality conditions and disease resistance; species suitable for polyculture; and development of vaccines. In the Mekong River Delta, agencies like the Research Institute for Aquaculture No. 2 and Can Tho University should be involved in conducting research and giving recommendations to farmers.

Policy workshop at Can Tho University.

Catfish and climate change

Viet Nam is one of world's top five most vulnerable countries to sea level rise and the area most vulnerable to climate change impacts is the Mekong Delta. Mapping impacts and vulnerability, devising adaptation strategies at the national and local levels and strengthening the capacity of rural farming communities to manage the impacts of climate change are now a matter of urgency. This is more relevant for vulnerable sectors such as aquaculture that provide employment to a large number of small scale farmers and poor households.

Significance of Catfish farming

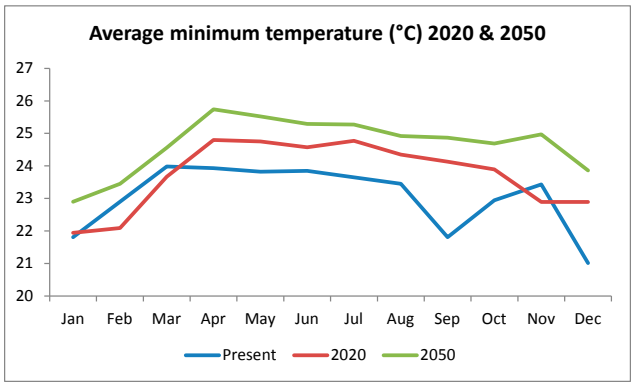
A major part of Viet Nam's aquaculture production, both for domestic and export markets is the striped catfish known locally as "ca tra". In 2011 total production reached 1.35 million tonnes from a production area of 5,430 ha. Approximately 660,000 tonnes of catfish were exported, generating foreign exchange of US$ 1.427 billion (VASEP, 2011, D-Fish, 2012).

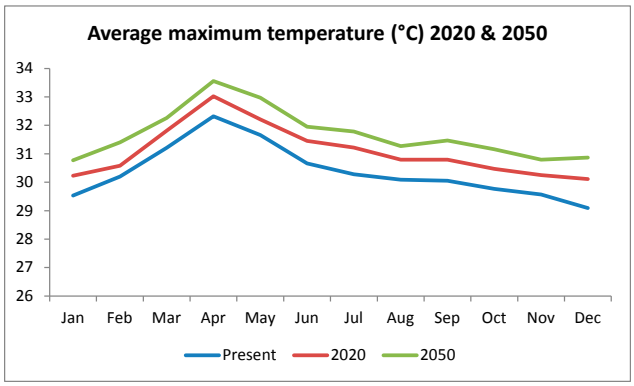
Catfish farming involves a diversity of stakeholders including farm owners, caretakers, processing plants (where women are > 70% of the work force), traders, seed and feed sellers and middlemen. An Giang is the most important catfish farming province in the Mekong delta with about 5,000 households involved, followed by Dong Thap and other delta provinces.

It is estimated that about 30-40,000 poor landless people are directly working in catfish farming at various levels, in addition to people involved indirectly. On an average, each hired labourer working on fish cages and ponds earns about VND 550,000-650,000 per month. Catfish also contributes as a source of protein to the local communities. Given this dependency, it is important to improve the adaptive capacity of the people involved in the sector.

Impacts of climate change on catfish farming

Climate change will impact the catfish farmers and they need to adapt their farming practices to maintain their livelihoods. As per predictions, the average monthly rainfall in the Mekong River catchment area in 2020 and 2050 will be similar to the present rainfall. However, peak rainfall is predicted to be 10% higher in August months, increasing the peak river flow. This together with rising sea level will increase the intensity of floods and reduce the available area for catfish farming. Efficient flood and dam management may help reduce this impact. With sea level rise, saltwater intrusion will increase in the lower Mekong River Delta and consequently river salinity will increase from December to March months. Saline intrusions will also reduce the potential culture area for catfish along the river banks and lower delta regions.





Average monthly maximum temperatures will increase by 0.7˚C by 2020 and 1.32˚C by 2050 respectively. There will also be hot weather spells for longer periods. The present peak average temperature, which occurs in April, will continue for two and a half months which poses significant risks to catfish, increasing disease risks and also aeration costs for keeping the required water quality. However, increased temperature between July and February will be positive for catfish farming leading to better food conversion rate and faster growth rate. The outputs from stakeholder analysis in the project indicated that farmers also consider longer hot season, increased saline intrusion, irregular weather and increasing river and flood levels as a serious threat.

The Aquaclimate Project is a three year initiative to strengthen the adaptive capacities of rural farming communities to the impacts of climate change. The project focuses on small-scale aquaculture in Viet Nam, the Philippines, India and Sri Lanka. This brief provides a summary of the project's work with catfish farmers in the Mekong Delta. It highlights the policy implications, research agenda and on farm adaptations that will be required to sustain the industry and its contribution to the livelihoods of poor farmers and food security. The project is coordinated by the Network of Aquaculture Centres in Asia-Pacific and funded by the Ministry of Foreign Affairs, Norway, through the Royal Norwegian Embassy, Bangkok, Thailand. The project was undertaken by international partners Bioforsk, Norway, Akvaplan-niva Norway, Kasetsart University, Thailand, the Department

of Aquaculture, Can Tho University and Research Institute for Aquaculture No. 2, Ho Chi Minh City, Viet Nam.

Policy adaptation measures

Standardised environmental monitoring and weather forecasting systems

Set up standardised environmental monitoring and weather forecasting systems for each province to provide early information and warning to farmers.

A majority of the catfish farmers are small scale, not organised and located in vulnerable areas in Viet Nam. The damage to farms and livelihoods mostly happens when farmers do not get timely information about extreme weather events, floods, water flows and due to a lack of preparedness for such events. The existing infrastructure and early warning systems are scattered and not adequate enough. Even if the early warning and monitoring systems are available they mainly focus on other sectors, and are not aquaculture or catfish industry specific and catfish farmers are not a target group for receiving such information in current monitoring and forecasting programs. There is a need to recognise that catfish sector should also be a target sector when planning for new environmental monitoring and weather forecasting systems. It will be less expensive for farmers to avoid damage, rather than repair once the damage has taken place. A well-developed monitoring and early warning system will assist in protecting the livelihoods and production of catfish industry.

A standardised environmental monitoring and early warning system would also be useful in providing timely information on water flows, river or canal water levels, water quality and early weather warnings that will be useful for catfish farmers to plan their activities. It will help farmers to act in advance, make decisions on investments and reduce losses on their farms. The information should be made widely available at the commune level on a daily basis. The use of mobile technology and radio to send weather related information to farmers should be explored. Provincial Governments should be responsible for implementing this policy measure supported by a national policy introduced by the Ministry of Agriculture and Rural Development.

Training and capacity building of farmers and other stakeholders

Design and implement short term training and capacity building courses on climate change impacts and adaptation in aquaculture for extension officers and farmers across the country.

The results from the project show that the awareness and knowledge of catfish farmers and stakeholders on issues related to climate change and their impacts are limited. For example, farmers are not aware of new strains of fish that can tolerate high temperatures or new systems of farming catfish. With such limited awareness it will be difficult for farmers to take up adaptation measures at the farm level. In many cases, by merely providing information or new knowledge or technology, farmers can benefit and adapt without much resources. Hence, our study suggests that by investing in training, the adaptive capacity of farmers can be improved significantly. The Government in Viet Nam does not have a policy and funding support for training and building capacity of the farmers and managers in aquaculture sector on issues related to climate change and adaptation. However, the new National Target Program to Respond to Climate Change (NTPRCC) 2008 emphasises on enhancing the role of science and technology for adaptation solutions and increasing public awareness and participation. This could be used a basis for developing new training programs at the provincial and commune level.

Training as suggested by stakeholders should be undertaken in two steps, first train selected scientific extension officers under the Department of Agriculture and Rural Development (DARD). The extension officers in turn should be made competent to train all catfish farmers. The training should be undertaken at province level for extension officers and the trained extension officers providing training to farmers at the commune level. Catfish farmers need training on new farming systems, for example new mixed farming systems that can be introduced under saline conditions, optimising feed and chemicals, adjusting farm management to increased floods and water flows, new strains of fish tolerant to higher temperature and adverse water quality and monitoring systems. DARD should be responsible for organising the training with training materials designed and prepared by local Universities and research institutes.

Access to credit and new weather based crop insurance policy

Ensure that small scale catfish farmers get access to credit and also covered by new crop insurance policy under development at the national level.

Aquaculture is prone to various risks due to production, weather, technological and market uncertainties. Losses arising out of these risks have to be mostly borne by farmers. Most catfish farmers are relatively small scale operators, and often find it difficult to adjust to uncertainties, especially the risks from extreme weather events and variability in climate. In recent years, weather based crop insurance for agricultural crops is becoming popular in many countries, providing farmers with a buffer against climate risks and losses in crop yields resulting from adverse weather events. Catfish farmers in general are not aware of such insurance policies, but this study has found that they generally would like to have access to such insurance. Weather based crop insurance

policies are currently being discussed at the national level in Viet Nam and aquaculture should be part of this dialogue. DARD should be the implementing agency for crop insurance in cooperation with private insurance companies and commercial banks.

Timely access to credit or soft loans with low interest rate is also necessary to repair and re-start new farming activities, especially when farmers suffer losses due to extreme weather events, and can help to improve farmers' adaptive capacity to climate shocks.

Co-ordination and cooperation between stakeholders

Increase co-ordination and cooperation between stakeholders, for example between different agencies at the provincial, district and commune levels and with regional agencies such as the Mekong River Commission to better address climate change impacts assessment and adaptation.

Climate change and impacts cuts across national, provincial and sectoral boundaries. In the lower Mekong Delta, sea level rise, floods and high water flows will have similar effects on other sectors including agriculture. With limited resources, countries like Viet Nam should prioritise introduction of combined adaptation measures that address the needs and problems of different sectors, rather than each sector duplicating measures and investments. Currently, climate predictions and impact assessment is being conducted by different Ministries. At the provincial level, the various sectors act independently, with some exceptions.

Good coordination at the national and provincial level will be useful for better planning and implementation of the adaptation measures, pooling resources from different departments and avoiding duplication of effort by different departments. The Ministry of Agriculture and Rural Development should be responsible for introducing such coordination possible under the new Action Plan Framework on adaptation to Climate Change for the Agriculture and Rural Development Sector, Period 2008 – 2020. To begin with, a working group with representatives from various relevant departments should be set up at the provincial level under the supervision of the Department of Agriculture and Rural Development for initiating such cross sectoral co-ordination and cooperation. The NTPRCC has set goals to involve a range of inter-sectoral institutional measures to address the cross-cutting nature of the impacts of climate change. These include vulnerability assessments across sectoral, regional, and community levels and integrating climate change into development strategies, plans, and programs in all sectors.

Increase research funding and activities

Increase research funding to address climate change impacts assessment and adaptation in catfish farming sector in particular and aquaculture in general and emphasise on strengthening science-policy linkage.

Currently, science and policy linkage is rather weak in the aquaculture sector. Research is carried out independent of the policy needs and vice versa. It is necessary to strengthen the science –policy linkage so that the real problems of farmers can be addressed more effectively. During the study, farmers expressed that they need new technology and scientific inputs to address the problems they face from climate change impacts. More research has to be undertaken through a long term breeding program and validated in real time field conditions in order to:

- Develop new strains that can tolerate higher temperatures, higher salinity and more variable water quality that are predicted in the Mekong Delta.

- Identify suitable culture systems to cope with higher salinity levels such as recirculated water and alternative culture species that are suitable for polyculture or that are salt tolerant.

In the Mekong River Delta, there should be a research agenda developed with suitable funding to be undertaken by agencies such as the Broodstock Station No. 2, the Research Institute for Aquaculture No. 2 and Can Tho University. There is also a need to link science to farmers' needs and policy development in the future. The so called science-policy linkage should be strengthened for meaningful policy development. Participatory research and demonstration should be encouraged with active involvement of farmers and women.

Summary of recommendations for key stakeholders

Stakeholder group	Recommendations
Policy makers (Ministry of Agriculture and Rural Development, Department of Agriculture and Rural Development)	• Improving coordination and cooperation between agencies on climate adaptation programs • More investment in training, research and capacity building • Environmental monitoring and early warning systems
Research and Development (Research Insitutes (such as the Research Institute for Aquaculture No. 2, Can Tho University)	• More research through long term breeding programs and validation at farmer level • Development of training curriculums, training materials and facilitating training and capacity building for extension officers and farmers
Private sector (insurance companies and commercial banks)	• Provide crop insurance policy • Facilitate credit for small scale farmers