Policy and Practice Brief 4

Farming Households' Vulnerabilities and Adaptation to Weather and Water Variabilities

AQUADAPT
www.aquadapt.org

Inland Aquaculture and Adaptation to Climate Change in Northern Thailand

Contexts of Risks

Agriculture and aquaculture depend not only upon the weather and natural resources like water, but also upon such factors as state policies, markets, and power relations among farmers and agri-businesses, all of which are embedded within processes of globalisation, urbanisation, and rural restructuring. The research questions focused on how farming households become vulnerable, and how they adapt to risks of production, in particular, arising from changing weather and water resources. Using qualitative research methodology, the research team studied 137 farming households, including both fish farmers and crop-and-livestock farmers, from 7 villages situated within the irrigated areas of Ping and Ing rivers basins from the cool season of 2012 through to the wet season of 2014.

Community Vulnerabilities

At the river basin level, fish cage farming communities are vulnerable in two ways. First, two fish cage farming communities were located below either a large hydroelectric dam or small weirs and experienced water scarcity, river bank erosion and changes in river channel. Second, another fish cage farming community was located above a weir and vulnerable to torrential floods during the wet season. In contrast, earthen-pond fish farming communities were vulnerable in two other ways. First, vulnerabilities that are caused by urban encroachment, municipal effluents, agrochemical residues, and land and water competition within agricultural sector as well as between urban and agricultural sectors. Second, vulnerabilities that are caused by weak water user groups unable to negotiate with other stakeholders, leading to less and poorer quality water for paddies, orchards, and fish farms.

Household Vulnerabilities

At the household level, almost all farmers produce in both farm and non-farm sectors. Farms can be grouped by size according to areas of ponds or number of cages, as well as area of land used for other purposes or numbers of livestock and poultry. Large-scale farmers are relatively less vulnerable than medium-scaled and small-scale farmers since they have better access to land, capital, labor, technology and knowledge necessary for fish culture. They not only diversify their livelihood portfolios, but also hold secure production activities that help absorb risks from aquaculture such as orchards, paddies, pig farming and non-farm jobs with high regular income. Medium-scale and small-scale farming households are moderately and highly vulnerable due to high household dependency while their income-earning abilities are lower than large-scale farming households. In addition, their farms are located in risk-prone areas such as irrigation tails, shallow waterways, poorly-drained areas, and riversides unprotected from strong currents. In short, farmers have been susceptible to multiple risks and vulnerabilities ranging from market fluctuation, public policies, and production relations. The vulnerabilities of those farming fish, rice, upland crops and orchards are aggravated by weather and water variabilities including droughts, delayed rainy season, overcast sky, localised and uneven precipitation, floods, fast flows and water pollution.

Unit for Social and Environmental Research

Faculty of Social Sciences, Chiang Mai University
Chiang Mai 50200 THAILAND

USER
www.sea-user.org
053 854 898

Policy and Practice Brief 4

Farming Households' Vulnerabilities and Adaptation to Weather and Water Variabilities

AQUADAPT
www.aquadapt.org

Inland Aquaculture and Adaptation to Climate Change in Northern Thailand

Farm-level Adaptation

Adaptation depends on the level of perceived risks as well as household and community adaptive capacities. Within specific production structure, households alternate capital among different production activities to alleviate production losses, or shift profits from one activity to invest in another activity. For instance, they transfer income from pig or chicken farming to invest in fish farming, or transfer income from rice, orchard and upland crop production to compensate losses in fish farming. On the other hand, some earthern -pond farmers use profits to invest in horticulture and trade. However, most fish cage farmers mix and use profits (if any) from different sources without clear separation between activities. Anyway, during time of study, most fish cage farmers did not make profits. The earthen-pond system is physically more stable than the river cage system due to lower exposure to external risks. River cages are directly influenced by irrigation management decisions, hydropower production operations as well as weather variability.

Social Capital and Adaptation

Earthen-pond fish farming households cooperate as fish farmer groups or cooperatives in order to collectively manage production, distribute produce and group learning to reduce risks from weather and water variability. Intensive joint learning process among kin and neighbors as well as with agribusiness companies helps reduce differences among farmers of different scales of operation in applying knowledge and technology to adapt. Nevertheless, there are apparent differences in adaptive capacities among large, medium and small-scaled farmers. Among those farmers with more connections with state or external agencies than with kin groups, large-scale farmers gain better access to knowledge and technology to increase output than medium- and small-scale farmers. Despite such access, some large-scale farmers do not disseminate or exchange knowledge and technology with medium- or small-scale farmers.

Mobility as an Adaptation

Population mobility helps fish farmers' adaptation through various kinds of remittances including money, social connections, knowledge, skills and experiences. Comparison of mobility and remittances, before and after fish farming periods, in terms of distance, duration, frequency, and characteristics of mobile persons reveals that most large-scale farming households receive more remittances than medium- and small-scale households under two conditions: 1) long-term interregional and intercontinental migration, and 2) high-frequency local mobility. Both conditions help fish farmers develop knowledge, skills and experiences that contribute to reduce risks in fish farming as well as diversifying income opportunities during normal and crisis periods. Therefore, large-scale households have much more adaptive capacities than medium- and small-scale households.

Recommendations

- Roles of the state and academics should be increased in disseminating knowledge and technology to farmers as well as improving weather information systems so they are more accurate, timely and accessible.
- Fish cage farming households and communities should cooperate as groups, similar to earthen-pond fish farmers' groups, in order to exchange knowledge and information and to increase their economic bargaining power.
- A multi-stakeholder platform at a river basin level should be created and strengthened with inclusion and equal recognition of fish farming communities with other stakeholders. The platform should facilitate deliberation, exchange and formulation of regulation or institutions for joint water management at both river basin and irrigation project scales.

Unit for Social and Environmental Research

Faculty of Social Sciences, Chiang Mai University
Chiang Mai 50200 THAILAND

USER
www.sea-user.org
053 854 898