SALWEEN YOUTH ENGAGEMENT PROGRAM

TECHNICAL REPORT

Assessment of Small-scaled Fish Farming Practices in Kunhing Region and Impacts on Local Livelihoods and the Salween River Basin Ecosystem



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Research Team

Nang Phoo Phoo San, Shoon Lae Win, Htet Htun Aung, Myint Thaw

EXECUTIVE SUMMARY

This study examines fish farming practices in Kunhing Region, Southern Shan State, and their implications for local livelihoods and the Nam Pang–Salween River Basin ecosystem. Kunhing Region was selected as the study location because fish farming activities in the area rely directly on water extracted from the Nam Pang River, and because fishponds, residential communities, and local markets are closely interconnected. This context allows for an integrated assessment of livelihood and environmental interactions consistent with the project objectives.

Field data were collected using qualitative methods, including semi-structured interviews, direct field observations, and local market visits. A total of 32 participants took part in the study, comprising fish farm owners, fish farm laborers, neighbors living near fishponds, and fish sellers. Among the five fish farm owners interviewed, four were male and one was female. Participants were selected through purposive sampling, focusing on individuals directly involved in fish farming activities, affected by fishpond operations, or engaged in fish marketing.

The findings indicate that fish farming plays an important role in supporting household income, employment opportunities, and local fish supply in Kunhing Region. Reported changes relate mainly to income levels, production outcomes, and management practices rather than changes in the number of fishponds. Fish farming systems in the area are predominantly small-scale traditional and semi-commercial, relying on earthen ponds and basic management practices.

Perceived environmental changes were reported primarily by neighbors living near fishponds, who described increased water turbidity and reduced water availability during the dry season. These observations are based on local perceptions rather than direct measurements. Overall, the study highlights the need to strengthen technical capacity and environmental awareness to balance livelihood benefits with long-term river ecosystem sustainability.

INTRODUCTION

Aquaculture has become an important livelihood activity in inland regions of Myanmar, particularly in Shan State where access to rivers and natural water sources supports small-scale fish farming. Fish farming is commonly promoted to enhance food security, generate income, and reduce economic vulnerability among rural households. In Kunhing Region, many households operate fishponds that rely directly on water drawn from the Nam Pang River, a major tributary of the Salween River.

The Covid-19 pandemic increased economic pressures on rural communities and reinforced reliance on existing livelihood activities such as fish farming. However, small-scale aquaculture in Southern Shan State is often practiced using basic methods with limited technical guidance and environmental awareness. Despite the growing importance of fish farming, limited research has examined its post-Covid livelihood and environmental implications at the local level. This study addresses that gap by examining fish farming practices and their interactions with livelihoods and river ecosystems in Kunhing Region.

Goal

The overall goal of this study is to examine fish farming practices in Kunhing Region and their impacts on local livelihoods and the ecological health of the Nam Pang, Salween River Basin.

Specific Objectives

The specific objectives of the study are

- To document fish farming practices and systems used in Kunhing Region,
- To assess the importance of fish farming for household livelihoods and employment, and
- To examine perceived ecological and social impacts associated with fish farming activities.

METHODS

Study Area

The study was conducted in Kunhing Region, Southern Shan State, focusing on fish farming areas located near the Nam Pang River, surrounding residential communities, and Kar Li Market. These locations represent direct interaction points between fish farming activities, river water use, and local livelihoods. The Nam Pang River connects directly to the Salween River Basin, making the area suitable for examining conservation of livelihood linkages.

Research Methods

This study employed qualitative research methods, including semi-structured interviews and direct field observations. Interviews were conducted with fish farm owners, fish farm laborers, neighbors living near fishponds, and fish sellers. Interviews with fish farm owners and laborers focused on fish farming practices, pond management, seasonal activities, and livelihood dependence. Interviews with neighbors explored perceptions of water use, environmental changes, and potential conflicts related to fishponds. Fish sellers were interviewed to document commonly farmed species and market-related aspects. Direct field observations were used to assess pond structures, water sources, feeding practices, and overall pond conditions.

Sampling, Data Management and Analysis

Participants were selected using purposive sampling, targeting individuals directly involved in fish farming, affected by fishpond operations, or engaged in fish marketing. Interview data were recorded through detailed notetaking during field visits and subsequently transcribed. Data were organized thematically and analyzed qualitatively to identify recurring patterns across respondent groups. Percentages and numerical values presented in the report were calculated based on the number of respondents answering each relevant interview question.

Limitations

The research faced several limitations, including restricted access to some sites due to community concerns, language barriers during interviews, unable to shadow fisherman and extreme weather conditions that reduced observation time. These constraints may have limited the depth of discussion in certain locations.

RESULTS

Fish Farming in Kunhing

Fish farming in Kunhing Region is primarily practiced by pond owners with support from family members and hired laborers. Gender participation figures refer only to fish farm owners, not laborers or neighbors. Among the five fish farm owners interviewed, four were male and one was female, meaning that male participation accounts for 80% and female participation for 20% of fish farm ownership in the sample. These percentages were calculated based on the total number of fish farm owners interviewed.

Fish farming in Kunhing Region is predominantly small-scale and household-based, forming an important part of local livelihood strategies. Fish ponds are commonly located on privately owned land near residential or agricultural areas and depend directly on water extracted from nearby streams connected to the Nam Pang River. Farming activities are managed using basic techniques, reflecting limited access to advanced aquaculture technology and financial resources. Fish farming operations are closely integrated with household labour, with daily activities such as feeding, water management, and harvesting carried out by family members or hired labourers.

Most fish farm laborers are engaged in daily maintenance, feeding, and harvesting activities, while ownership and decision-making responsibilities remain concentrated among pond owners.

Fish Farming Systems

Pond sizes vary depending on land availability and household investment capacity. Recorded pond dimensions include ponds measuring 30.5 meters by 30.5 meters with a depth of 1.2 meters, 36.6 meters by 36.6 meters with a depth of 1.2 meters, and larger ponds measuring 91 meters by 91 meters with a depth of 1.2 meters. Smaller ponds were also observed, including ponds measuring 10 meters by 10 meters with a depth of 1.2 meters.

These variations indicate that fish farming in Kunhing Region operates at a small to medium scale, using simple pond structures without advanced infrastructure. The systems observed are best described as traditional and semi-commercial, rather than fully commercial aquaculture operations.

The fish species in the fish farming includes tilapia, grass carp, silver carp, common carp, mrigala carp, rohu carp, orange fin labeo, walking catfish, barb, and snakehead.

Management of Fishponds

Fish farming in Kunhing Region follows a structured management process that includes pond preparation, irrigation, feeding, and harvesting. Pond preparation generally involves cleaning, drying, and repairing pond structures to ensure suitable conditions for fish stocking. This preparation is usually carried out before the onset of the rainy season. Most fishponds are repaired only once every three years, reflecting both financial constraints and reliance on basic pond infrastructure.

Irrigation practices depend primarily on river water drawn from nearby streams connected to the Nam Pang River, with rainwater supplementing water levels during the wet season. Feeding practices rely largely on locally available inputs, including household food waste and simple feed materials, rather than commercially manufactured fish feed. Daily pond management and feeding activities continue throughout the year, while harvesting is typically conducted during the dry season, when water levels are lower and fish have reached marketable size. Overall, fishpond management practices demonstrate farmers' adaptation to seasonal climate patterns and water availability.

Marketing of Fish

Fish produced in Kunhing Region is primarily sold through local markets and informal trading networks. Fish sellers play a key role in linking producers with consumers, while some fish farmers sell fish directly to local buyers. Marketing activities are generally small-scale and oriented toward meeting local demand rather than external markets.

Harvesting decisions are strongly influenced by market demand. Farmers often harvest fish when prices are favorable, rather than following fixed production cycles, to maximize income. This flexible marketing approach reflects the economic priorities of households and the importance of fish farming as a source of cash income.

Importance of Fish Farming

Dependency on Fish Farming

Fish farming represents an important source of livelihood for many households in Kunhing Region. For some families, it serves as a primary income-generating activity, while for others it functions as a significant secondary source of income. Fish farming contributes to household food security by providing a reliable source of protein and reducing dependence on purchased food.

Job Opportunities for Laborers

Fish farming generates employment opportunities for local laborers, particularly during labor-intensive periods such as pond preparation and harvesting. Laborers are commonly engaged in activities including cleaning ponds, repairing structures, feeding fish, and harvesting. These employment opportunities provide regular income for individuals with limited alternative livelihood options, although the work is physically demanding during peak seasons.

Gender Perspectives

Gender participation in fish farming differs across roles. Fishpond ownership and decision-making responsibilities are largely held by men, while women play important supporting roles in daily management activities such as feeding, monitoring ponds, and marketing fish. Women's involvement in fish selling contributes directly to household income, even though they are less represented in ownership positions.

Ecological Impacts

Fish farming activities in Kunhing Region interact closely with the river environment due to reliance on direct water extraction from the Nam Pang River and connected streams. Perceived ecological impacts were reported mainly by neighbors living near fishponds, who described increased water turbidity and reduced water availability during the dry season. These observations are based on local perceptions rather than measured environmental data.

Socio-Economic Impacts

Among those who received training, many reported difficulties applying new techniques due to financial constraints and lack of technical support.

Challenges and Opportunities

Limited access to formal training in aquaculture and environmental management remains a key challenge. Most farmers rely on traditional knowledge and informal learning.

Awareness of river basin connectivity and long-term environmental impacts of fish farming is generally low. Strengthening awareness presents an opportunity to improve sustainability without undermining livelihoods.

DISCUSSION

The findings of this study indicate that fish farming plays an important role in supporting livelihoods in Kunhing Region through income generation, employment, and local food supply. The results suggest that fish farming activities are sustained mainly through continued use of existing ponds rather than expansion in pond numbers. This indicates that fish farming has become a stable livelihood strategy rather than a rapidly growing activity, which has implications for both livelihood planning and environmental management.

Fish farming practices in Kunhing Region remain predominantly small-scale, traditional, and semi-commercial. Management relies on basic techniques, local knowledge, and direct river water use. While these practices enable households to continue fish farming with limited resources, they also highlight gaps in technical capacity and environmental awareness. If not addressed, these gaps may increase pressure on shared water resources, particularly during the dry season.

Gender and labor patterns observed in the study show a clear division of roles. Men are more commonly involved in pond ownership and decision-making, while women contribute significantly to daily management and fish marketing. Laborers view fish farming as an important source of employment, despite the physically demanding nature of the work. These findings underline the livelihood value of fish farming while also pointing to the need for more inclusive and supportive approaches.

Perceived ecological and social impacts were reported mainly by neighbors, particularly concerns related to water turbidity and reduced water availability during the dry season. Although these observations are based on perceptions rather than measurements, they remain important indicators of community concerns and potential sources of tension among water users.

Based on these findings, improved knowledge, awareness, and coordination among stakeholders are required. For researchers, combining community perceptions with basic environmental monitoring would strengthen understanding of fish farming impacts. For decision-makers, including conservation organizations and relevant authorities, practical training on sustainable pond management, water use, and environmental awareness would support livelihoods while reducing pressure on river ecosystems. Such approaches are consistent with IUCN's people-centered conservation principles and can contribute to balancing livelihood benefits with long-term ecosystem health in the Nam Pang–Salween River Basin.

BUDGEDARY FRAMEWORK

No.	Description	Requested Budget	Expenditure	Balance
1.	Research materials	1,196,000	971,300	224,700
2.	Transportation	2,110,000	1,270,000	(840,000)
3.	Meals and allowances	3,720,000	3,112,300	607,700
Total Budget		7,026,000	5,353,600	1,672,400

No.	Description	Requested Budget	Expenditure	Balance
1.	Research materials	1,026,000	968,800	57,200
2.	Transportation	1,490,000	1,270,000	220,000
3.	Meals and allowances	2,440,000	3,009,300	(569,300)
Total Budget		4,956,000	5,248,100	(292,100)