

# Global Innovations–Local Solutions for Enhancing Sustainable Aquaculture for Poverty Eradication

Maroti Upare

The former Fisheries and Credit Expert FAO and former General Manager, National Bank for Agriculture and Rural Development, Mumbai. Wide experience in fisheries including aquaculture management and governance in India and abroad i.e. Vietnam, Malawi, Sierra Leone, Bangladesh, Tajikistan, Uzbekistan, Kyrgyzstan besides India etc. Presently, working as consultant to the World Bank and FAO

## Corresponding Author

Maroti Upare

## Article History

Article id: CBM001

Received in: 11<sup>th</sup> December, 2016

Received in revised form: 18<sup>th</sup> February, 2017

Accepted in final form: 04<sup>th</sup> March, 2017

## Abstract

The innovative community based tank management projects implemented by support of the World Bank in Karnataka and Andhra Pradesh and Agricultural Competitiveness project in Assam and UNDP supported–aquaculture development in northern uplands of Vietnam are sustainable innovative projects for development of livelihood. The project thus directly contributed to the achievement to eradicate poverty and hunger and to promote gender equality and empower women for poverty reduction for achieving livelihood. These projects had impact including women for providing services for economic development through community participation of disadvantaged people of society. The project experiences are innovative and replicable for achieving conservation of bio-diversity, poverty alleviations and supporting sustainable livelihood.

**Keywords:** Aquaculture, innovations, microfinance, poverty reduction, bio-diversity

## 1. Introduction

The major objective of aquaculture development is to reduce poverty and to provide productive employment to people whose income is less than one dollar a day. The task of achieving this objective has become more challenging. The MDG effort of development threatened by a global economic slowdown and food security crisis.

Aquaculture provides best food security to hungry people. Therefore attempt is made in this paper to discuss innovations in aquaculture projects supported by the World Bank in Assam, Karnataka, Andhra Pradesh in India and UNDP/FAO in Vietnam, Bangladesh, Sierra Leone which has reached to ordinary people, women in marginalized section of society. Case studies can lead path for better livelihood, service delivery, public private partnership, model for providing support by donor agencies, Community involvement by creating better leadership with disadvantage people.

2. FAO/UNDP supported project VIE/98/009–aquaculture development in northern uplands of Vietnam

### 2.1. Background and objectives

The project aimed to reduce poverty and enhance local food security among poor upland ethnic communities through

small-scale aquaculture development. This was being done by strengthening the local capacity of poor and remotely located ethnic communities and organizations of the 50 pilot communes located in the three northern upland provinces of Hoa Binh, Son La and Lai Chau of Vietnam.

The productivity of small-scale aquaculture in upland areas was being increased through:

- development of appropriate aquaculture technology packages;
- establishment of aquaculture extension services;
- improving local availability of fish seed;
- a commune managed credit and savings scheme.

The project emphasizes empowerment of women through:

- improving the productivity and profitability of family aquaculture;
- introducing appropriate aquaculture technologies;
- training;
- assigning them the lead role in household aquaculture.

The project thus directly contributed to the achievement of MDGs i.e. to eradicate poverty and hunger and to promote gender equality and empower women.

### 2.2. Project execution



- The project was executed over a period of three years by the Ministry of Fisheries and implemented by the Dept. of Agriculture and Rural Development (DOARD) in the three project provinces. FAO was the co-implementing agency and provides project technical assistance through the services of international consultants under the Support for Technical Services (STS) component. The project commenced in April 1999 with the appointment of the National Project Director (NPD) and the Project Manager (NPM). The Ministry of Fisheries provides the services of personnel and office facilities for the project management unit in Son La Town.

- The Provincial Governments of Lai Chau, Son La and Hoa Binh are providing facilities for Provincial Implementation Units (PIU) of the project under the respective DOARD Offices. All three PIUs are headed by Vice-NPDs who are responsible for implementing and monitoring of project activities in their province.

**Organizational Arrangements of Micro-credit Scheme**

Women unions at commune, district and provincial level play key role. The individuals, groups and organizations involved in micro-credit scheme:

1. members of aquaculture credit groups;
2. Management committees of aquaculture credit groups;
3. District women unions;
4. Provincial women unions;
5. National aquaculture extension centre/provincial agriculture and rural development department.

Organizational arrangements of micro-credit scheme Women unions at commune, district and provincial level play key role

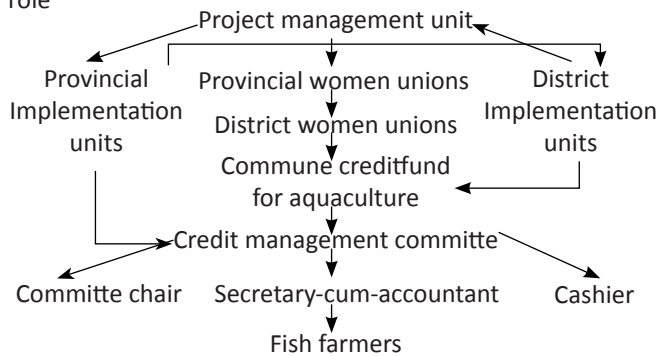


Diagram of micro-credit scheme management structure under the project

**2.3. Role, obligations and privileges of individuals and groups in credit scheme members of aquaculture credit groups**

1. Elect members of management committees of aquaculture credit groups;
2. Deposit savings with management committees of aquaculture credit groups;
3. Submit loan applications to aquaculture credit groups;
4. Repay loans (interest and principal) to management committee of aquaculture credit groups;
5. Receive technical assistance from aquaculture extension

service;

6. Report to aquaculture extension service on production figures, growth rates of fish and other technical matters.

**2.4. Management committees of aquaculture credit groups**

1. Are elected by members of aquaculture credit groups;
2. Receive savings deposits from members of aquaculture credit groups;
3. Receive and examine loan applications;
4. Receive loan repayments;
5. Monitor loan use and loan repayment of members of aquaculture credit groups;
6. Manage loan repayments and savings and maintain financial records;
7. Submit endorsed loan repayments to district women unions;
8. Report to district women unions;
9. Convene monthly or quarterly meetings of members of aquaculture credit groups;
10. Assist district women unions in loan disbursements;
11. Transfer loan principle repayments to district women unions;
12. Manage and safe-keep interest repayments and savings deposits and use them for lending to members of aquaculture credit groups as well as for covering their and the women unions administrative cost;
13. Report to and liaise with local Government authorities as required district women unions;
14. Supervise management committees of aquaculture credit groups under their jurisdiction;
15. Receive and examine monthly accounts/progress reports from management committees of aquaculture credit groups;
16. Receive repayments of loan principal from management committees of aquaculture credit groups; receive share of repayment of loan interest from management committees of aquaculture credit groups for covering their cost of operation;
17. Deposit funds in VBARD and maintain financial records;
18. Examine loan applications submitted by management committees of aquaculture credit groups and approve loans;
19. Disburse loans to members of aquaculture credit groups;
20. Report to provincial women unions;
21. liaise with aquaculture extension centres and local Government authorities provincial women unions;
22. Annual internal auditing of accounts;
23. Supervise the district women unions and receive quarterly progress reports;
24. liaise with provincial Government authorities and central Government authorities; receive a share of repayment of loan interest from management committees of aquaculture credit groups for covering their cost of operation national aquaculture extension centre/provincial agriculture and rural development department;
25. Provide extension services to members of aquaculture credit groups;
26. Assist members of aquaculture credit groups in preparation



of production plans;

27. Assist women unions in technical appraisal of loan applications;

28. Receive production figures from members of aquaculture credit groups.

2.5. Achievements of micro-credit programme

Overall, the microcredit component of project VIE/98/009 can boast an impressive performance with regard to poverty alleviation and livelihood enhancement for socially disadvantaged ethnic minorities in three mountainous provinces in northern Viet Nam-Lai Chau, Son La and Hoa Binh. The achievements can be described in terms of well-functioning aquaculture microcredit groups and credit management committees; savings generated; amount and no. of loans disbursed and recovered; turnover and efficient use of capital and savings; building of national capacity for the design and implementation of microcredit schemes in support of aquaculture development in upland areas; the active participation of women and the poor in the management of the scheme; and use of credit for aquaculture development.

By the end of the project, D1 million 47 132 had been disbursed (US\$314 213). This is more than double the amount (209%) that had originally been allocated in the project budget for credit disbursements. It shows that the funds have actually revolved as farmers repaid their loans and the amounts repaid were then used for further loan disbursements. Altogether, 3 630 households in all six districts of the project were reached by the microcredit component of the project, received loans and deposited savings.

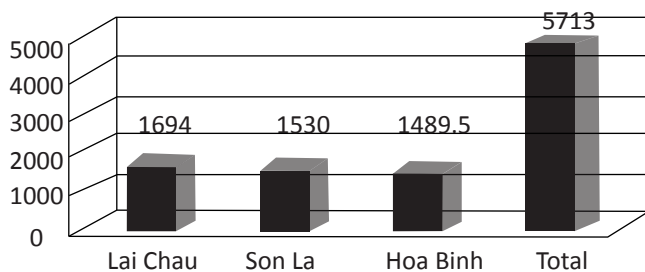
Loan repayment was excellent and the ratio of amount due for repayment and amounts repaid was as high as 100% in Son La province and 98% in Hoa Binh and Lai Chau provinces. The excellent repayment figures were achieved despite short repayment periods which, in most cases, did not exceed 12 months. As far as the impact of the project by income stratification is concerned, initially the majority of loan recipients belonged to the middle-income group while poor farmers benefited to a lesser extent from the credit support provided by the project. A better capacity for improving their aquaculture practices and the willingness to incur debt for this purpose were probably the major factors behind the leading role of the middle income group in the use of credit for improvement of their aquaculture practices.

Later, however, this trend changed as poor households as well as the village authorities became more confident that fish farming was a technically and economically viable activity. At the end of the project, 68% of all loan recipients can be classified as poor households, 31% belonged to the middle-income group and only 1% belonged to the upper income level category. The project reached its target group, i.e. the ethnic minorities in the three mountainous provinces of Son La, Hoa Binh and Lai Chau. The ethnic minorities that benefited from the project include the Thai, Muong, Khmu and H'mong

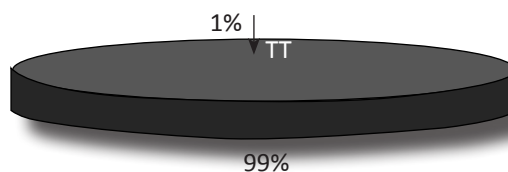
ethnic groups.

The active participation of women in the management and use of credit for aquaculture development was also achieved. The majority of the members of the management committees and group members are women as are 85% of the credit recipients. The achievements in the three provinces are shown in the figure below.

Indicators	Lai Chau	Son La	Hoa Binh
Project loans (Million dong)	715.8	715.8	715.8
Total loan value (Million dong)	1693.7	1530	1489.5
Saving amount (Million dong)	103.9	99.8	72.0
Recovery rate (%)	98.2	100	98.0
Accured capital (Million dong)	20.0	39.0	25.0
No. of borrowers	1630	970	1040
Percentage of women (Out of total)	94	81	73
Poor borrowers	1139	752	600
Percentage of poor (Out of total)	70	77	58



Credit delivery during project life (in million dong)



Credit delivery during project life (in million dong)

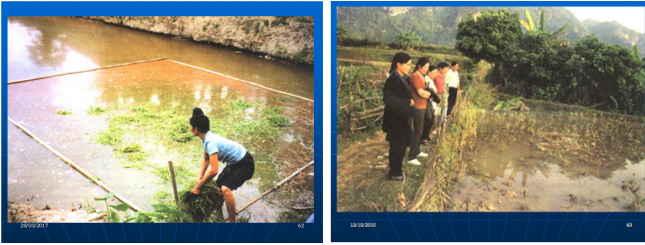


Microcredit and enhancement of role of women

In terms of continuation and expansion of the microcredit programme in Viet Nam and its sustainability, VBARD and the Viet Nam Social Policy Bank (VSPB), together with the Women's Unions of Viet Nam, are expanded the programme

to other parts of the country, using national financial resources after donor support had ended.

Women aqua-culturist in Vietnam



Credit activity results in 3 provinces (in million VND)

Credit activity results in 3 provinces (in million VND)			
Indicator	Lai Chau	Son La	Hoa Binh
Project loans	715.8	715.8	715.8
Total loans	1 693.7	1 530	1 489.5
Savings	103.9	99.8	72
Recovery rate	98.2	100	98
No of borrowers	1630	970	1040
% of women borrowers	94	81	73
% of poor borrowers	70	77	58

The achievements include

- Well functioning aquaculture micro-credit groups and credit management committees;
- Income and savings generated and poverty eradicated;
- Fish produced for local consumption and improvement of nutritional situation;
- Amount and number of loans disbursed and recovered;
- Turnover and efficient use of capital and savings;
- Women’s unions are very satisfied with the success of the micro-credit programme in support of aquaculture and fully appreciate the support they have received from the project;
- They are keen and interested in continuing and expanding it.

**3. Integrated development of rural fishing villages in Sierra Leone (West Africa)**

*3.1. Introduction and objective*

The project was implemented in least developed country Sierra Leone in West Africa in the World with poor human resources development index, having population of four million. The project was funded by United Nations Capital Development Fund and implemented by FAO in eleven villages of Shenge region of Sierra Leone. The major objective were–

- To increase fish and agriculture production by enhancing their livelihood.
- Provide sustainable technical and credit support.
- Set up community based management system for resource management and for marketing.

- Improving access for health and education facilities and other infrastructure.

*3.2. Achievement and impact*

The community organized eleven fishermen cooperative societies and their apex Federation at Shenge and provided multiple services such as supply of fishing nets, seed, diesel, daily need items for home consumptions, credit for purchase of fishing and agriculture implement for transport of fish to various destination for marketing and inputs etc. The Federation empowered to provide ambulance service for shifting patients to District hospitals and provided truck facility the total beneficiary were 11,000 farmers and fishermen

**4. INDIA–World Bank Supported Projects**

*4.1. Assam agriculture competitiveness project*

The project is supported by the World Bank. Significant progress has been achieved in the implementation of aquaculture subcomponent. The achievement in terms of physical programme is over 90% i.e. 2263 ha against target of 2500 ha of farmers` individual ponds ranging from 0.03-0.40 ha. The intensive aquaculture management practices were adopted by forming 1812 Common Interest Groups, popularly known as CIGs covering about 26372 beneficiaries. These beneficiaries renovated ponds and undertaken fish farming. The average fish production realized about 3000 kg per ha/ annum against 1000 kg/ha/annum in pre-project scenario and gross income realized ha<sup>-1</sup> is around ₹ 2, 14,000.

The community tank development activity has progressed well. The community based tank management practice was adopted by forming about 463 Community Tank Groups (CTGs). They developed more than 460 ha water area against 500 ha area proposed for development (92% achievement). Average ha<sup>-1</sup> production has increased to the level of 2500 kg/ ha/annum against 800 kg in pre-development.

The achievement under Integrated Fish Farming (IFF) with horticulture and pigs is highly satisfactory, about 240 ha water area developed under IFF against 250 ha envisaged in project. The achievement to the tune of 96%. The average fish production reported above 3150 kg/ha/annum against baseline fish production of 1000 kg/ha<sup>-1</sup>/year.

*4.1.1. Achievement*

- Outreach to about 40,000 beneficiaries covering women, small and marginal farmers.
- Developed leadership by forming Common Interest Groups for management of ponds for aquaculture.
- Achieved 3000 kg fish production/ha/year against 1000 kg in pre-project period
- The development is sustainable and replicable.

*4.2. Karnataka community–based tank management project implementation progress at a glance*

The project supported by the World Bank and innovations brought prosperity to landless people, women through



aquaculture. The salient features are as follows;

- Physical progress-The target for development of fisheries in 600 tanks under project achieved by 100%.
- Source of livelihood—About 8000 persons were provided livelihood from fisheries development so far which represents 75% landless beneficiary and 25% marginal farmers.
- Increase in fish production and productivity-Fish production achieved around 624 t so far from tanks developed under project. The ha<sup>-1</sup> productivity enhanced from preproject 160 kg to above 500 kg.
- Improved food security of village community-The community were sold fish with less than market rate by majority TUGs and few TUGs supplied one or two kg fish free of cost to members. Fish production improved food security.
- Encouraged gender participation—About 30% women members were involved in fisheries activities which accounts for 30% participation by women.
- Social empowerment—From inception of fisheries activities in 2002–03 till May 2010 about Rs. 155 lakhs realized from sale of fish. The share of beneficiaries received from sale of fish harvested from project was worth Rs. 108.5 lakhs, providing additional average annual income in the range of Rs. 3000 to Rs. 3500 per beneficiary
- Major source of fund for tank maintenance—It is estimated that TUGs received about Rs. 46.5 lakhs (cumulative) as 30% share from sale of fish which are being used as revolving fund for O and M of tanks. It was also reported that income from fisheries activities is the major source received to TUGs for tank maintenance.
- Policy initiatives—Fisheries Dept. has issued policy order in 2006 for leasing tanks on priority basis to TUGs registered under Societies Act in JSYS for MI tanks above 40 ha command area. Now, Rural Development and Panchayat Raj Dept. also issued circular on 28th January 2010 for leasing GP tanks on priority basis to TUGs for fisheries development.

#### 4.3. Andhra Pradesh community based tank project

This World Bank assisted project shown that poor can improve their economic standards through community participation by accessing common property use of natural resources. The fisheries sub-component has continued to show good progress. Since project inception improved fish production practices have been introduced in 1097 tanks covering an effective water spread area about 67,262 ha in two cycles till date against an end project target of 1300 no. of tanks covering 78,006 ha WSA which accounts 86% achievement

in terms of water area brought under improved fish farming. About 7,484 fishermen were imparted training of improved fish farming technology and around 3000 fish farmers were provided exposure visits against target of 4,400. As a result of introduction of improved fish production technology and training of improved fish practice imparted to fishermen, it is reported that quantity of fish harvested 16,971 t from 37,970 ha WSA harvested, developed under two cycles till date. This translates to average productivity increasing from 125 kg/ha baseline to 447 kg/ha after project interventions. However, the year-wise fish productivity varies from 207 to 567 kg during last six years. About 75,000 fishermen members were provided livelihood support under project and technology adoption rate is reported 80%. The financial progress as on 31st March 2014 is Rs. 7.32 crores against total outlay for fisheries sector Rs. 10.60 crores.

#### 5. Recommendations

After analyzing above global and national programme and projects following recommendation proposed to complement existing efforts and accelerate development in aquaculture sector in India.

1. These innovative projects have shown that aquaculture through microfinance can be best tool for achieving reduction of poverty, gender participation, productive employment and best sustainable livelihood hence fisheries activity should be covered in Livelihood projects being implemented by various states governments.
2. Community based tank management projects supported by World Bank in Karnataka and Andhra Pradesh have shown that it facilitated to enhance livelihood, provide food security, employment and better income hence recommended for preparation of such projects in other states.
3. In order to enhance income of farmers and rational use of natural resources, recommended diversification of aquaculture activities by integrating with agriculture, horticulture and livestock.
4. There is need of policy initiatives, more research and technical support in effective management of inland fisheries resources i.e. rivers, canals, reservoirs and wetlands.
5. Aquaculture sector provides an opportunity for public-private partnership projects and for investment by donors in aquaculture sector globally. This need to be encouraged by State Governments.