

# Community Aquaculture for Poverty Alleviation in Rural Areas of Thailand

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The role of fish as traditional source of animal protein in the Thai diet is expressed in many common Thai expressions, such as: “*Kin kao kin pla leo yang?*” (Have you eaten rice and fish yet?), and “*Nai nam mee pla nai na mee kao*” (In the water there are fish, in the field there is rice). In Thailand, an enormous amount of fish is consumed in rural households because of its relatively cheap and affordable price as well as the nutritive value that fish provides especially to the people in rural communities. Among the various types of protein available, fish is preferred by poor rural villagers to meet their main protein requirement because of availability and affordability.

Thailand is rich in natural and man-made water resources that include natural lakes, dams and reservoirs, and freshwater ponds, which could be intensively tapped to promote community fishpond development throughout the country as means of eradicating hunger and malnutrition in rural communities. The people of Thailand have always been proud of their heritage particularly their land and the natural environment. As described aptly by Prompoj (1994) “even long before the age of the now famous Golden Triangle, this fertile country was already known as the Golden Land,” referring to the rich natural resources of Thailand that yield adequate quantities of products that ensure the food security of its people. Thailand has been endowed with abundant freshwater fisheries resources that led to the development of freshwater aquaculture systems especially for a number of freshwater aquatic species.

## Freshwater Fisheries Production of Thailand

Based on the Fisheries Statistics of Thailand (DOF, 2011), the country’s total fisheries production during the last decade had slightly decreased from 3,713,200 mt in 2000 to 3,287,300 mt in 2009 (Table 1) due to the declining total production from marine fisheries. Considered a critical contributor to the country’s total fisheries production, marine fisheries accounted for about 78% of the total fisheries production in 2009. Production from freshwater fisheries, although still minimal in terms of volume and value, plays an important role in the country’s food security as freshwater fish has been providing the much need protein for the poor segment of the population. Nevertheless, the total freshwater fish production (Table 1, Fig. 1) has been increasing over the last decade from 472,500 mt in 2000 to 728,680 mt in 2009, while the almost stable trend of production from freshwater capture fisheries (201,500 mt in 2000 to 206,800 mt in 2009) implies that production from

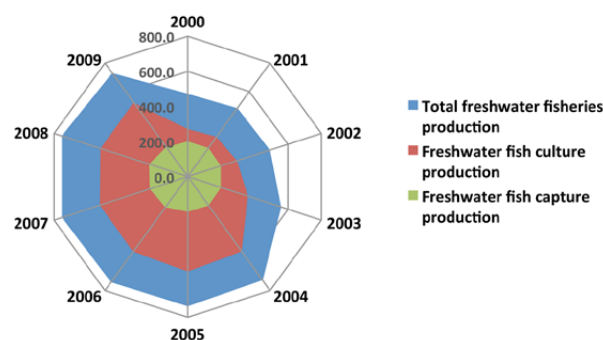


Fig. 1. Production from freshwater fisheries of Thailand in 2000-2009 ('000 mt)

Table 1. Fisheries production of Thailand in quantity (2000-2009) in metric tons (mt)

Year	Total Fisheries Production	Freshwater		Total Freshwater Production	Marine		Total Marine Production
		Culture	Capture		Culture	Capture	
2000	3,713,200	271,000	201,500	472,500	467,000	2,773,700	3,240,700
2001	3,648,400	279,700	202,500	482,200	534,500	2,631,700	3,166,200
2002	3,797,000	294,500	198,700	493,200	660,100	2,643,700	3,303,800
2003	3,914,000	361,100	198,400	559,500	703,300	2,651,200	3,354,500
2004	4,099,600	523,700	203,700	727,400	736,300	2,635,900	3,372,200
2005	4,118,500	539,400	198,800	738,200	764,700	2,615,600	3,380,300
2006	4,053,100	527,400	214,000	741,400	826,900	2,484,800	3,311,700
2007	3,675,400	525,100	225,600	750,700	845,300	2,079,400	2,924,700
2008	3,204,200	522,500	228,600	751,100	808,300	1,644,800	2,453,100
2009	3,287,280	521,880	206,800	728,680	894,800	1,663,800	2,558,600

Source: Information Technology Center, Department of Fisheries (DOF, 2011)

nature may not increase any more. Culture of freshwater fish is therefore an option to increase fish production that could meet the needs of the country's inland population (Choltisak, 2012).

## Rural Aquaculture Development Program

Recognizing that poverty prevails in the most disadvantaged communities of the country, the Government of Thailand has been intensifying its efforts towards the improvement of the well-being of peoples in rural communities. Through the Department of Fisheries (DOF), Thailand continues to promote freshwater aquaculture for rural development to increase fish supply, create employment opportunities, and eventually eradicate poverty in rural areas.

The DOF has been promoting rural aquaculture in Thailand for decades through research and extension services. In the past, the strategy for its small-scale rural aquaculture development program included providing the fish farmers with subsidies and substantial support as well as incentives, by providing them with free advisory services for the adoption of modern aquaculture technologies, and subsidized inputs for pond construction and management, seeds and feeds. Realizing later that subsidies do not necessarily lead to sustainable aquaculture development, the DOF shifted its support to extending adequate and appropriate information on aquaculture technologies to targeted fish farmers. This metamorphosis necessitated the DOF to require additional budgetary allocation to give more focus on rural aquaculture development, from 5.94 million USD in 2001 which continued to increase annually at 9.93 million USD in 2009 (**Table 2**). With such inputs, more than 20 freshwater fish species have been promoted for culture to 304,876 fish farmers in 6850 extension project sites in the last decade. This was achieved through the rural aquaculture development program of Thailand which includes four major projects, namely: Village Fish Pond

Development Project, School Fishpond Project, Training of Fish Farmers in Freshwater Fish Culture, and Culture of Indigenous Fish Species.

### Village Fish Pond Development Project

One of the most important rural fisheries development approaches, the Village Fish Pond Development Project (VFPDP) has been promoted with the main objective of strengthening social cohesiveness in rural communities (Virapat and Laoprasert, 2002). As a communal activity, culture of fish in freshwater ponds is recognized as crucial for community development as it could enhance cooperation among community members. Started in the early 1980s, VFPDP is aimed at increasing fish production for local consumption, creating opportunities for local employment, and ultimately alleviating malnutrition and poverty in rural communities.

Moreover, through human capacity building, the VFPDP aims to train rural community members to be more self-governing and self-reliant. From 1982 to 2002, VFPDP had overseen more than 20,000 freshwater fishponds which are mostly located in the northeast and northern areas of Thailand (Virapat and Laoprasert, 2002). Under the VFPDP, the role of DOF comes in the form of technical advice for the rehabilitation or construction of village fishponds (reservoirs, swamps, and tanks), adoption of appropriate freshwater fish culture technologies, and increased supply of quality fish seeds or fingerlings for increased fish production. The VFPDP embraces several sub-projects that have benefited the country's rural communities, *i.e.* Sustainable Fish Production in Natural Waters, Village Fish Breeding Center, and Fish Processing.

Considering that there were thousands of freshwater fishponds ranging from 0.2 to 20.0 ha in the rural areas of the country producing fish not sufficient enough even for local consumption (3-5 kg/ha/year), the DOF was challenged to promote effective management of these ponds to enable fish farmers to increase their production (Virapat, 2007). Thus, the VFPDP was initiated and has since then been instrumental in the country's increasing numbers of freshwater fishponds from 256,082 in 2000 to 550,631 in 2009, as well as in terms of the area cultivated from 96,145 ha in 2000 165,210 ha in 2009, and average productivity of about 3.25 mt/ha/year (**Table 3**). When the Government of Thailand decided to transfer in 2001 the authority for management of natural resources including fisheries in all community waters to the local government units, locally known as Tambon Administrative Organization (TAO), which are responsible of rural development, the responsibility of implementing the VFPDP including the budgetary allocations were also gradually transferred

**Table 2.** Budget for freshwater aquaculture development in Thailand

Year	Budget for Aquaculture Development Program (in USD)	Number of Trainees (Farmers)	Number of Extension Project Sites
2001	5,940,669	48,487	140
2002	4,527,563	34,500	168
2003	11,084,514	58,592	168
2004	7,074,920	29,200	1,030
2005	9,701,034	30,000	1,034
2006	10,819,570	27,555	1,049
2007	12,010,483	26,000	1,056
2008	9,444,479	24,542	1,100
2009	9,930,799	26,000	1,105

Source: Information Technology Center, Department of Fisheries (DOF, 2011)

**Table 3.** Number of freshwater aquaculture farms in Thailand

Year	Total Number of Farms	Total Culture Area (ha)	Total Production (mt)	Productivity (mt/ha)
2000	256,082	96,145	271,000	2.82
2001	268,591	100,553	279,700	2.78
2002	281,199	101,952	294,500	2.89
2003	333,537	111,903	361,100	3.23
2004	423,083	143,501	523,700	3.65
2005	468,926	149,574	539,400	3.61
2006	488,167	151,138	527,400	3.49
2007	496,124	149,228	525,100	3.52
2008	500,785	153,819	522,500	3.40
2009	550,631	165,210	521,880	3.16

Source: Information Technology Center, Department of Fisheries (DOF, 2011)

from DOF to the TAO from 2001 until 2004. However, the DOF continues its role of providing technical inputs for the effective adoption of VFPPD in the rural areas of the country.

### School Fishpond Project

Under the patronage of Her Royal Highness *Princess Maha Chakri Sirindhorn*, the School Fishpond Project which is also known as Lunch Program targets mainly the village primary and secondary schools in remote rural areas. The main objective of this project is to impart on school children the skills in fishpond preparation, fish stocking, feed preparation using locally available ingredients and low-cost methods and facilities, feeding management, and harvesting. The school children eat the fish they raised during school lunch, therefore this scheme provides the means of producing fish for daily consumption in schools through self-help initiatives in fish culture.

In addition to serving as means to teach children on the basic principles of freshwater fishpond culture and to be self-reliant, the project also provides outreach human capacity building to parents and other members of the communities. Thus, the project was later expanded to include integrated fish-poultry farming, now serving as focal point for the sustainable development of freshwater aquaculture in remote rural areas. Through the school fishpond development activities, students and the communities together take part in an experiential learning process that actively demonstrates the potential benefits of improved fishpond management to livelihoods and human nutrition. To date, the DOF continues to provide technical support to this School Fishpond Project which now covers the border areas of the country.

### Training of Fish Farmers in Freshwater Fish Culture

Through the DOF, training of general fish farmers in fish culture was also conducted to increase fish production from

community fishponds for local consumption. Several on-site training activities have been adopted under this project, such as the establishment of the learning centers for fish seed production. Moreover, training sessions were also conducted in DOF facilities on fish disease management, fish culture technology, fish nutrition, among others. Since its inception in early 2000s, the project has trained more than 300,000 fish farmers including their children in about 6850 project sites in remote rural areas of the country.

### Culture of Indigenous Fish Species

DOF has continued to conduct research projects on the culture of indigenous fish species which has been running in the country during the last decade. The DOF researchers experimented on the culture of more than 60 indigenous fish species and came up with more than 1,000 technical research reports which provide the necessary knowledge for the aquaculture of indigenous fish species for extension to the fish farmers.

### Consumption of Fish in Thailand

A study was conducted in the poorest areas of Thailand on consumption of fish and other aquatic species from inland fisheries. The results indicated that the poor is highly dependent on the aquatic resources for their subsistence. The estimated annual per capita consumption of fish of the people based on a field survey of 465 sample households in 1998-1999 was 28.8 kg/capita/year of which 92.5% was in the form of fresh fish. As a matter of fact, freshwater fish accounted for 70-90% of the total quantity of fish consumed in all regions of the country (**Fig. 2**). Tilapia is the most preferred freshwater fish (8.5 kg/capita/year or 29.6%) followed by the Thai silver barb (4.7 kg/capita/year or 16.3%) and striped snakehead (4.4 kg/capita/year or 15.4%).

In terms of household expenditures for food, fish ranked among the primary animal protein sources accounting for 15.6% of the total expenditures, together with chicken, pork, and beef which contributed around 14-17% (Piumsombun, 2001). Based on the fisheries statistical

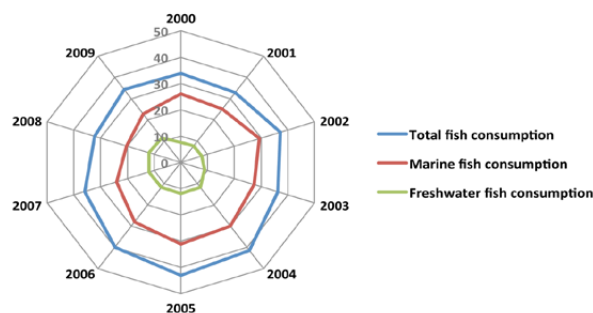


Fig. 2. Total fish consumption of Thailand in 2000-2009 (kg/capita/year)

Source: Information Technology Center, Department of Fisheries (DOF, 2011)

**Table 4.** A decade of fish consumption in Thailand

Source of Fish Consumption	Fish Consumption in 2000 (kg/capita/year)	Fish Consumption in 2009 (kg/capita/year)	Ratio
Total Fish Consumption	33.76	34.21	1.01
Marine Fish Consumption	26.13	22.74	0.87
Freshwater Fish Consumption	7.64	11.47	1.50

Source: Information Technology Center, Department of Fisheries (DOF, 2011)

report of Thailand (DOF, 2011), the efforts of DOF to promote community aquaculture throughout Thailand in the last ten years, had contributed positive impacts with respect to fish consumption at the national level. As can be gleaned from **Table 4**, the total fish consumption from 2000 to 2009 had increased by 1.01 times, from about 33.8 kg/capita/year to 34.2 kg/capita/year, respectively.

Meanwhile, the consumption of marine fish on the one hand had slightly decreased by 0.87 times from about 26.1 kg/capita/year to 22.7 kg/capita/year. On the other hand, the consumption of freshwater fish increased by more than 1.50 times from 7.6 kg/capita/year to 11.5 kg/capita/year, implying that freshwater fish could serve as main source of protein for rural communities. However, there is a need to promote improved freshwater community aquaculture in order to increase production and sustain its role in alleviating poverty and eradicating malnutrition in rural communities.

## Conclusion and Way Forward

Over all, Thailand is not short of food fish as protein source for its people especially those who are in the rural communities. However, it is imperative that sustainable yields from natural waters and increased productivity in fish culture are ensured. The responsibility of the DOF in the past was focused in maintaining the stable status of capture fisheries production particularly in freshwater and more particularly in increasing production from community aquaculture, as it is in this aspect that the needs of the Thais for food fish can be fulfilled. The role of DOF had been successfully undertaken especially in terms of supporting the fish consumption needs of the country. However, its efforts were without challenges and difficulties, in which case Thailand would still need to continue generating advanced aquaculture techniques as part of its next step in development, in order to sustain the responsible utilization of its natural aquatic resources, and to eventually eradicate hunger and malnutrition in the rural areas of the country.

The experience of Thailand in community aquaculture development, e.g. the Village Fish Pond Development Project and the School Fishpond Project, demonstrates the

applicability of community-based participatory approach in remote rural areas to increase fish production for food security. This approach could be adapted in the rural areas of other Southeast Asian countries, especially in the countries bordering Thailand, *i.e.* Cambodia, Lao PDR and Myanmar, where freshwater ponds could be developed to increase fish production for the daily fish consumption needs of the peoples in the rural areas, eradicate poverty and achieve food security.

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