

and other colleagues and friends for their support.

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Fish Seed Production and Marketing in Northeast Thailand

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Abstract

In Northeast Thailand, fish seed production by private hatcheries is being encouraged by the Department of Fisheries. Dissemination of technical knowledge to hatcheries has considerably improved fish seed availability over the last decade, which has stimulated the adoption of fish culture.

Introduction

Fish seed, mostly produced by private entrepreneurs who have supplanted government fisheries stations, is easily available to farmers in northeast Thailand who stock and raise them in ponds and rice fields. The Thai Department of Fisheries (DOF) has encouraged this trend by supporting private hatchery development through training, extension and marketing assistance. The production char-

acteristics of private hatcheries have been assessed (Little et al. 1987; Purba 1990) but the current status of production and marketing in this dynamic environment is not known. In recent years, hatcheries have been concentrated in certain areas and mobile seed vendors have emerged as major players in fish seed distribution. The results of a study undertaken to assess the current practices of fish seed production and the role of mobile vendors in the distribution are reported here.

The Study

Distribution and Classification of Fish Hatcheries

Official statistics indicate that the fish hatcheries in Northeast Thailand are concentrated in Nong Khai and Mahasarakham provinces with 500 and 200 hatcheries, respectively, while isolated hatcheries are distributed all over the region. The hatchery situation was classified according to location within or outside a concentration

of operations (> 100 in a single village). Small and large hatcheries were classified by annual seed production (small <5 million fingerling/year; large >5 million fingerling/year) (Table 1).

Table 1. Mean fish seed production $\times 10^4$ (SE).

	Size of hatcheries	
	Small	Large
Concentrated	1.7 \pm 0.4	8.8 \pm 1.9
Isolated	3.0 \pm 0.4	8.8 \pm 1.2

Research Design

The research hypothesized that the size, scale and location of hatchery may affect both production and marketing of fish seed. Fourteen hatcheries, five small and three large from concentrated areas in Nong Khai and Maharakham, three small and three large from isolated areas in Khon Kaen province, and several mobile vendors were surveyed from April to June 1994. Production and marketing indicators were identified and quantified. Characteristics of mobile traders were also assessed through interviews and observation at hatcheries and by traveling with a single operator during his working day.

Experience

Operators of small hatcheries in concentrated areas had significantly less experience in seed production than other groups (Table 2). Hatcheries with more than 10 years' experience appear to have received formal training from the DOF and other government and non-government organizations. A small minority of trained farmers subsequently established hatcheries in isolated rural areas.

Table 2. Fish seed production (years).

	Size of hatcheries	
	Small	Large
Concentrated	2.0 \pm 0.4	18.5 \pm 6.5
Isolated	14.0 \pm 1.5	10.2 \pm 2.7

Species

All hatcheries more or less produced seed of the same fish species. Details of fish species used for seed production and their ranking are given in Table 3.

Seed Price

Typical selling size of carp fish seed was 2-3 cm and the price depended on species, season, size and number purchased (Table 4). Small, isolated hatcheries commanded higher prices for their produce, whereas prices were most competitive in concentrations of small hatcheries, most of which sold their produce to the wholesale trade. There was a clear dependence on intermediate traders for the concentrated and large hatcheries whose production quickly exceeded the needs of local markets.

Marketing Channels

There are six marketing channels (Fig. 1) for private hatchery-produced seed throughout the region and beyond. In addition

to the stocking of ponds or rice fields owned by individual households, large quantities are also stocked in community water bodies through DOF. Mobile traders play an important role in marketing seed from small hatcheries, particularly those in concentrated areas, whereas larger hatcheries usually deal with such traders through secondary and often smaller hatcheries. Large hatcheries—both in concentrated and isolated areas—primarily have wholesale trade with other hatcheries (Table 5), supplying to order so that a variety of species is available. Agents are usually local fish farmers who arrange the sale and delivery of seed from a larger hatchery for local groups of farmers. Only small, isolated hatcheries market their fry directly to growout farmers in the same area. Mobile traders use pickup trucks or motorcycles to transport and sell fish seed even in remote villages. The customers who buy seed from vendors are generally rice farmers often relatively inexperienced at raising fish. The demand for fish seed peaks during the early wet season (May-August) although considerable variations occur within the region and from year to year. At this time of the year, farmers

Table 3. Fish species ranked by importance for seed production in northeast Thailand.

Scientific name	Common name	Number of hatcheries by size	
		Small	Large
<i>Puntius gonionotus</i>	Silver barb	8	6
<i>Cirrhinus mrigala</i>	Mrigal	7	6
<i>Cyprinus carpio</i>	Common carp	6	6
<i>Labeo rohita</i>	Rohu	5	6
<i>Clarias</i> spp. ¹	Catfish	4	3
<i>Aristichthys nobilis</i>	Bighead carp	1	5
<i>Tilapia</i> spp.	Tilapia	2	2
<i>Hypophthalmichthys molitrix</i>	Silver carp	0	3
<i>Ctenopharyngodon idella</i>	Grass carp	1	2

¹ *Clarias gariapinus* or its hybrid with *C. macrocephalus*.

are busy with rice farming and unwilling to travel long distances to buy small numbers of fish seed. Local and timely availability of seed is essential and mobile vending has developed to meet this need.

Hatcheries of all types in the region specialize in producing carp fish seed. Large hatcheries control the countertrade of tilapia and catfish seed production in central Thailand.

Mobile Trading

Traders hawking fish seed in pickup trucks first appeared around 1989. More than 300 are believed to be active during the season and are concentrated in the provinces of Mahasarakham and Khon Kaen. Fish seed selling is a seasonal activity, so during the off-season the traders sell other goods such as ducklings, fruit or furniture. Many large hatcheries refuse to sell seed directly to mobile traders due to their reputation for cheating their customers over the number and species of fish. Seed are typically purchased by vendors and packed late in the evening ready for transportation and sale in the village early to mid-morning. Arriving in the village at a time when farmers are travelling to their rice fields and ponds usually stimulates rapid sales.

Fish seed are packed in oxygenated plastic bags according to individual size (500-600 seed of 3-5 cm, 800-1 000 seed of 2-3 cm). Distance, duration of transport and temperature are important factors that affect seed quality and their subsequent survival on stocking. Traders attempt to keep the seed cool by covering plastic bags with wet sacks.

Table 4. Selling price (Thai Baht/100 seed) of carp seed (2-3 cm in length).

Situation	Price	Size of hatcheries	
		Small	Large
Concentrated	Wholesale	5.5 ± 1.5	6.0 ± 1.0
	Retail		10.0
Isolated	Wholesale	9.0 ± 1.0	7.0 ± 0
	Retail	10.0	10.0

¹ US\$1 = Baht 25.

Table 5. Ranking marketing channel by importance for each hatchery type.

Situation	Size of hatchery	
	Small	Large
Concentrated	3>4>5>1>6	4>5>1>2>3>6
Isolated	1>3>4>5>6	4>5>1>2>3>6

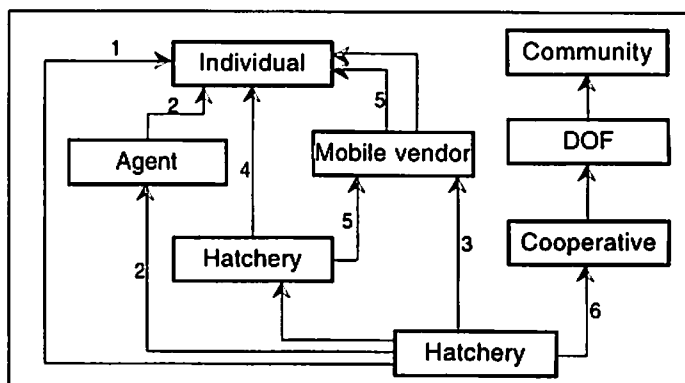
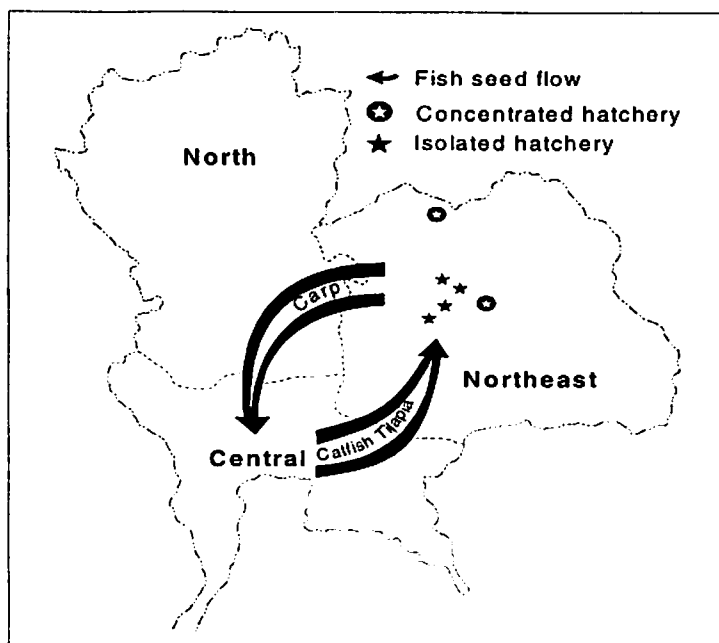


Fig. 1. Six marketing channels within the fish seed network.



Fish seed counter trade between Central and Northeast regions of Thailand.

Conclusion

The Thai Department of Fisheries lacks resources to reach all potential fish farmers directly. Dissemination of technical knowledge to hatcheries has considerably improved fish seed availability over the last decades and, in turn, stimulated the adoption of fish culture. Strategies to further promote fish culture in the region could include transfer of improved seed and production techniques directly to private hatcheries, quality testing and endorsement of fish seed at hatcheries and dissemination of extension messages through hatcheries and traders.

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A rice farmer checking the quality of silver barb seed before purchase from a mobile vendor.



Each farmer normally only buys 2-3 bags only of fish seed for stocking in the rice field or pond.

