

Poster 3-9

## Seed quality research on freshwater finfish supply networks in Asia

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The production of freshwater fish based on stocking hatchery-produced seed has become increasingly important in Asia in recent decades. Falling *per capita* consumption of fish, and other aquatic foods, indicate the deterioration of wild stocks under pressure. The trend towards a greater reliance on cultured fish is likely to increase as demand by both rural and urban people increases, and access to natural stocks declines further.

A pre-condition for widespread adoption of aquaculture in its various forms, has usually been the ready availability of seed. Hatcheries, especially those producing carp seed, are well-established in countries where aquaculture is having most impact on livelihoods of the poor. Both Government and private entrepreneurs now produce fish seed in countries such as Bangladesh, Thailand and Vietnam where aquaculture is well-established. Increasingly, networks of private producers and traders dominate the supply of seed to farmers stocking fish seed and are important promoters of fish production.

Although fish seed is often abundant and cheap, a common emerging concern is that of poor quality. Fish seed that survive, or grow poorly undermine both attempts to promote farming fish among new adopters and the consistency required by commercial farmers to produce low-cost fish for poorer consumers. Poor quality may also undermine the livelihoods of actors in the supply network who, particularly within the trade and distribution sector, are often poor, marginalised individuals, or those within the nursing and hatchery sector who face great economic risk.

A major issue is whether the poor performance of stocked fish observed regionally is due to sub-optimal seed quality or simply inadequate management by the farmer after stocking. Further, if fish seed quality is to blame, is the major cause of poor quality genetic or management related? As fish seed stocked by farmers is frequently handled by many 'actors', poor management may occur at many stages.

Government agencies need to understand the importance of fish seed quality, and its impact on fish production, if resources are best to be targeted, and policy decisions on future investment and management options improved. Conventional data collection, analysis and dissemination typically produces information that is too little and too late to inform such decisions.

The Fish Seed Quality in Asia project<sup>11</sup> aims to identify and characterize the nature of quality constraints in carp and tilapia seed production in five areas of Asia and develop templates for strategies to deliver quality fish seed. A series of workshops involving farmers, hatchery and nursery operators, traders and policy makers have been held to establish current status at four of these locations and to identify major seed quality issues. Participative methods involving collection and synthesis of information on current practice and opinion from a broad range of stakeholders were the basis for the concept of State of the System reporting. Intensive fieldwork followed by initial analysis and presentation of results to stakeholders was followed by revision and production of concise,

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<sup>11</sup> The Fish Seed Quality project is supported by financial support to the Asian Institute of Technology and partner institutions in 4 countries by the Aquaculture Research Programme, DFID, UK. Partner institutions are the Research Institute of Aquaculture No. 1, Ha Bac, Vietnam, College of Agriculture and Forestry, Ho Chi Minh City, Vietnam, Regional Development Committee (RDC) for Livestock and Fisheries Development in Southern Lao PDR, the Department of Fisheries Thailand and the Department of Fisheries, Bangladesh. The AIT Aqua Outreach Program has facilitated the project in Vietnam, Thailand and Lao PDR and in Bangladesh this function was performed by the DFID Fisheries Programme

readable reports by local partner institutions. Research and implementation agendas were defined within State of the System Reports<sup>12</sup> that were printed and disseminated locally.

Trials on-farm and with local institutions are now underway or planned to compare and quantify performance differences between seed available to farmers. Project findings will be used as guidelines for the partner institutions to improve research, extension and policy foci.

#### Structured Approach

- *Problem recognition and definition* Surveys in four areas of Asia, samples included all actors in the seed supply network; farmers, traders/distributors, nursery operators and hatchery operators
- *Participatory methodology for problem understanding and system description.* Stakeholder workshops led to identification of researchable issues and policy recommendations.
- *State of the System reports* produced in the local language and English.
- *Researchable issues* identified and addressed by partner institutions or other institutional actors operating in the region. Certain issues have already been addressed; in five areas research, which has been centrally coordinated and facilitated, is ongoing.

#### Key benefits of process

- Workshop forum bringing all stakeholders together, often for the first time, promoting dialogue and raising awareness.
- Accessible, bilingual, reporting methodology using informal language for dissemination and use not only within the aquaculture research sector
- Needs of stakeholders addressed by practical research into pressing constraints.
- Capacity for research and extension improved in partner institutions and recommendations for appropriate policy foci made to regulators.
- Promotion of intraregional flow of specific information about research on common problems/issues.
- Common research needs identified and synergistic activities planned

#### Findings

Common issues arising from the surveys and workshops were;

- Perception that state produced seed was of better quality than private hatchery seed
- Seed production of high demand species does not fill the demand. this demand may be fueled by perceptions of quality in relation to production as well as market forces
- Quality issues can include size at sale, cheating on species and number as well as the usual survival and growth parameters.
- Perception and assessment of quality can vary within the same network depending on experience, market orientation and role within the network.

Most research is still ongoing but preliminary results have been;

- In Thailand extreme variability in seed quality both from private and public sectors. Major impacts of poor quality seed appear to be related to poor survival immediately post stocking rather than poor growth or survival during growout.
- In Laos PDR variability in quality with state sector performing worst. Provincial government hatcheries were able to use the monitoring system that had been developed together in a workshop

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<sup>12</sup> State of the System Reports for Bangladesh, Northeast Thailand, Northern Vietnam and Southern Vietnam are available from Angus MacNiven, AARM/SERD, Asian Institute of Technology, P.O. Box 4 Klong Luang, Pathumthani 12120, Thailand. Telephone +66(0) 2 524 5220, Fax +66(0)2 524 5217. Email [angusm@ait.ac.th](mailto:angusm@ait.ac.th)

held the previous year. This allowed constraints to their hatchery management to be established and in particular to establish the continuing poor nursery pond management prevalent in one hatchery.

- In northern Vietnam some variability in seed quality in early rearing from both hatchery sectors.

Project activities are now based on a work plan developed over the last few months with project coordinators. Activities include;

- In northern Vietnam a study of fry quality obtained from traders selling fry around the Delta, network analysis within a traditional fry nursing and trading centre
- In southern Vietnam, a comparison of tilapias obtained from different sewage-fed hatcheries and an assessment of the impact of transportation on them.
- In southern Lao PDR, the investigation began last season on seed quality available at the District level will be broadened to include areas more distant from government and imported seed and repeated to validate recent findings.
- In northeast Thailand the impacts of nursery practice on tilapia seed quality and transportation on silver barb seed will be conducted
- In northwest Bangladesh a comparison of introduced and current strains of silver carp will be finalised, a trial in which overwintered and new season seed are compared at the nursing, trader and food fish farm level is underway. It is planned to assess the livelihood impact of hatchery compared to self recruited seed for poor producers and consumers
- The impact of the State of the System reporting process on institutions and policy will be monitored.