Adding fish as a farming enterprise

Can fish be a key to helping Indian farming families climb out of poverty? India has nearly 40% of the world's absolute poor and 30% of the population of the world's low-income countries. The Eastern Plateau states of Bihar, Orissa and West Bengal, in particular, are characterised by poverty and inequality, land alienation and seasonal migration. Some castes and tribes are amongst the poorest communities in India.

Aquaculture may hold the potential for marginal farmers to diversify and improve their livelihoods

Most farming families in the region rely on rainfed crops and livestock for their livelihoods. Some have access to water for small-scale irrigation. Lowland farmers have more reliable perennial supplies whereas upland farmers must rely on seasonal rains and tanks for storage.

Water in storage provides the opportunity for farmers to develop aquaculture to complement their traditional sources of income. Fish is highly valued and is a valuable source of protein for the family, yet it is surprising to find that aquaculture is not widespread among farming communities. Research suggests that aquaculture may hold the potential for marginal farmers to diversify and improve their livelihoods. But if the benefits are so clear and so obvious why are they not doing it?

Support for aquaculture in India is well developed. It comes mainly from the government Departments of Fisheries, research institutes and NGOs. These have traditionally promoted large-scale capital-intensive systems. High levels of inputs are required which aim to maximise production. Centralised hatcheries

are used to produce fry, which are sold on to produce fingerlings, which are then passed on to large production units to grow them on to maturity and harvest. Poly-culture is encouraged enabling a range of different fish to be grown in the same pond. Some occupy the bottom of the pond whereas some prefer to feed close to the water surface. By careful management all the available water can be used to maximum advantage. Production under these conditions can be up to 4-5tonnes/ha of water area. But the inputs to this approach to fish farming are also significant. Large perennial water bodies are needed and other water uses and users are usually excluded. Feed and other inputs must all be bought in.

THE PROBLEM

This activity is well supported by research conducted on research stations but there are problems with developing and disseminating this technology to farmers. This constraint has

been widely recognised since the early 1990s. There is no tradition of fish farming among the poorer communities. Research has been technology based and has not addressed the main issue of how farmers can benefit from this knowledge. How can they incorporate aquaculture into their farms when they cannot afford the capital inputs and running costs of intensive systems or accept risks that such investments entail? Are there alternative strategies that require less input and less risk?

THE PROCESS

To investigate the possibilities of introducing aquaculture, a participatory approach was adopted recognising that farmers as well as each of the institutions involved in research and dissemination has a stake in aquaculture development and a role to play. This approach has enabled the research team to identify household priorities and experiences regarding options and approaches to take. Many important issues emerged from a stakeholder planning workshop. Some unexpected, such as the cultural issue of taking presents to family and friends when visiting. The usual practice is to take chicken even when a household can ill afford to do so. Fish was considered to be a very acceptable alternative.

Common interest groups engaged in aquaculture from clusters of neighbouring villages were encouraged to meet together regularly as Matsya Anusandhan Sahayak Committees MASCs (farmer research support committees). They identify, implement and evaluate research to target the needs of small and marginal farmers following initial support and institutional strengthening from community organisers.

The challenge of moving from the intensive fish production model to one in which small farmers could participate is a complex one. No one farming family could cope with the whole process from producing hatchlings to market sized fish. Yet if the process was to be split up, who would be responsible for producing hatchlings and who would then take on the

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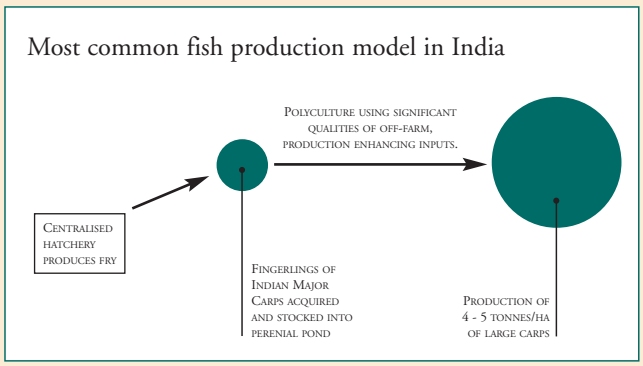
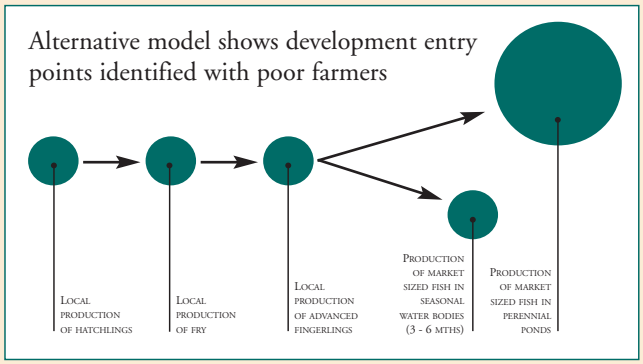
production of fry in a way that would allow others to grow the fish on to market size? A complex chain was needed with each link being dependent on its neighbours. Specific service components needed to be investigated to determine potential entry points for different groups. Can affordable functional hatcheries suitable for isolated communities be produced? Can groups of farmers produce fry and advanced fingerlings in temporary water bodies before the on-set of the rains? Can they produce market-sized fish in seasonal water bodies, which hold water for only 3-6 months of the year? In each case, is the technology accessible and attractive? Farmers know, for example, that larger fish survive better than small ones and so the risks





attending the production of fry and fingerlings are that much greater.

A Research Co-ordination Committee drawn from the main stakeholder groups co-ordinates research across the project, analyses overall results and feeds these back to the individual MASCs. Where promising new ideas come forward to address identified constraints and are more appropriately developed and/or tested on-station, this is undertaken by suitably equipped stakeholder groups. Village-based open days and research station-based open days are held to share research results as appropriate, and an iterative process now exists for upgrading and refining promising recommendations and discarding or amending those that fail.

THE OUTCOME

In the first season farmers groups in nine villages undertook 26 aquaculture trials. In initial MAS committee meetings, group brainstorming was used to identify the problems perceived/encountered by the farmers and specific researchable constraints were listed and prioritised. The results were evaluated by farmers in Farmer Network Meetings, and fed back to the Research Coordinating Committee. Their role was to consider the broader picture, co-ordinate research across the project, analyse overall results and feed this back to individual MAS committees.

Research project outputs include recommendations based on knowledge generated (based on the on-farm trials) and methodologies used relating to the farmer participatory research methodology. Part of the project aim is to disseminate both these types of information to researchers, development organisations and farmers.

Results to date include the evaluation of different species grown to fry, fingerling and marketable size stages in seasonal water bodies, and the testing of different fry transport methods and small-scale hatchery designs for the local production of fry. In-depth analyses of farmer adoption rates and impact of research are currently being undertaken. Preliminary data suggest that one year after the first trials, farmers are now independently (i.e. without project support) including aquaculture in their livelihood portfolio and they are experimenting with different aquaculture systems, based on the knowledge gained from the project trials.

R6759 Integration of Aquaculture into the Farming System in the Eastern Plateau of India.

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