



Photo credit: Sonabh Debby/WorldFish

FACT SHEET

Taking Nutrition-Sensitive Carp-SIS Polyculture Technology to Scale



Background

Fish is an irreplaceable source of micronutrients in diets in many developing countries, where large numbers of vulnerable people belong to “fish dependent” populations. Small indigenous fish species, collectively referred to as SIS, are regarded as natural “superfoods” because they are much richer in vital micronutrients, such as calcium, zinc, iron, and vitamins A and B12, than common farmed fish, like rohu and catla. SIS are small, growing to a maximum length of about 25 cm, and largely inhabit freshwater ecosystems. However, SIS have become increasingly at risk because of resource degradation, overexploitation, pollution and climate change. Although once ubiquitous and affordable, some SIS are now scarce and expensive, making them less accessible to lower- and middle- income fish consumers.

Over the past decade, WorldFish has promoted the inclusion of SIS in carp-based pond polyculture in Bangladesh and the Indian states of Odisha and Assam to popularize SIS production for household consumption and income generation. WorldFish’s research indicates that SIS can be co-cultured in fishponds alongside larger fish such as carp, and the inclusion of these fish in polyculture systems does not decrease carp production. However, unlike much of conventional aquaculture, which uses seed (juvenile fish) produced in hatcheries, these initiatives have relied on collecting SIS parent fish (broodstock) from natural sources to stock in farmers’ ponds, where they reproduce naturally. A lack of standardized hatchery-based mass production techniques for SIS seed is a key technical barrier to scaling up nutrition-sensitive aquaculture to reach many more people. To address this bottleneck, WorldFish is implementing the Taking Nutrition-Sensitive Carp-SIS Polyculture Technology to Scale project, with funding from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), in Odisha and Assam. A key goal of the project is to develop easily scalable techniques for the mass production of SIS seed by standardizing a method of hatchery-based breeding.



Project location

Odisha and Assam

Project name

Taking Nutrition-Sensitive Carp-SIS Polyculture Technology to Scale

Donor

German Federal Ministry for Economic Cooperation and Development (BMZ) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Project duration

March 2021–February 2024

Project objectives

- Assess factors influencing the adoption of carp-SIS polyculture technology under previous projects.
- Develop protocols for the mass production and transportation of seed for up to five nutrient-rich SIS.
- Validate business models for breeding and distributing SIS species in partnership with private seed supply enterprises.
- Provide technical training and outreach to ensure integration into public and private investments for further scaling.

Project activities

- Evaluate factors influencing the adoption, dis-adoption, diffusion and adaptation of carp-SIS polyculture technology promoted by previous WorldFish projects in Bangladesh, Odisha and Assam with an explicit focus on gendered dimensions and nutritional outcomes.
- Understand the prevailing market dynamics of SIS in Bangladesh, Odisha and Assam, with an emphasis on their value, preference and availability.
- Implement scientific breeding experiments in selected experimental sites in India to develop technical protocols for the sustainable mass production and transportation of seed for three to five key nutrient-rich SIS, including mola (*Amblypharyngodon mola*).
- Develop nursing and seed rearing protocols and feeding strategies for three to five key nutrient-rich SIS, including mola.
- Monitor SIS production, distribution and sales by partner enterprises in selected experimental sites in India.
- Develop and select one or more viable business models for multiplying and distributing SIS seed for further promotion while working with private actors in the fish seed supply chain.
- Share knowledge and technology on the mass production of SIS with actors in the supply chain, including hatcheries, seed traders, government, development agencies, grassroots institutions and entrepreneurs.
- Perform collaborative research with selected universities and research institutes in India to foster an enhanced understanding of fish genetics, ecology, breeding biology and linked socioeconomic issues.
- Develop knowledge products such as training manuals, extension videos, and peer-reviewed articles in Odia, Assamese, and Bangla language.

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Project webpage: www.worldfishcenter.org/project/taking-nutrition-sensitive-carp-sis-polyculture-technology-scale
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