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## SUCCESS STORY

# Researchers in Nepal repeat success with breeding native sahar in new location

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**Improved breeding techniques help support conservation and boost food security**



AquaFish researchers check the maturity of a sahar brood fish to determine its readiness to spawn.

The sahar (*Tor putitora*) is an endangered cyprinid endemic to Asia. Also called “mahseer,” it is a popular game fish and an economically important food fish in several countries across the Himalayan plateau. In Nepal, as in many places throughout its native range, overfishing and habitat alterations have caused widespread declines in sahar populations. Management efforts to reverse population declines, such as restoring habitat and curbing fishing pressure with government regulations, offer possible solutions. Another approach is to supplement the capture fishery by increasing supply from aquaculture production, which could allow for an enhanced market presence.

AquaFish researchers in Nepal are improving breeding techniques for sahar to support conservation and improve food security. Building upon past findings, AquaFish researchers at the Agriculture and Forestry University (AFU) developed artificial breeding techniques for sahar. Ultimately, the goal is to scale up seed production technologies. Many current hatchery operations use reproductive hormones to artificially induce the development of ova in female fish. Though effective, these techniques can have negative environmental effects that reduce the sustainability of the aquaculture operation.

Dr. Jay Dev Bista, AquaFish Host Country Co-PI, worked with colleagues at AFU and the Fisheries Research Center in Pokhara to establish a method that allows the fish to “ripen” (become sexually mature) more frequently than in the wild without the use of reproductive hormones. By controlling for temperature and stocking density in culture ponds, Dr. Bista and his team were able to create conditions that allowed nearly 100% of females to become sexually mature in February and March 2015, and achieved hatch rates between 75% and 95% after spawning and incubation.

The sahar, as with most other cyprinids (such as carps, minnows, and barbs), is capable of spawning multiple times per year. Replicating the same spawning frequencies at different hatcheries throughout Nepal will increase sahar seed production for grow-out farms, reducing the need for fishing bans and tighter regulations.

Although initial attempts to spawn sahar in Chitwan were unsuccessful, researchers achieved breeding success in the springtime, once water temperatures began to rise. These results are an encouraging step towards accomplishing the research objective of scaling up production of sahar seed for grow out operations at fish farms throughout the country.

In Nepal, where there are very few experts working in the field of aquaculture, knowledge transfer and extension activities are critically important for building capacity in the aquaculture industry, which relies heavily on government subsidies to keep fish farms running. By innovating methods for efficient, reliable seed production of sahar, Dr. Bista and his team hope their efforts will spur sustainable growth of the aquaculture industry in Nepal.

Culturing indigenous species helps avoid invasive species introductions, aligns with local cultural needs, and increases the available options for aquaculture production. AquaFish researchers in Nepal are paving the way for producing large volumes of sahar seed, as well as developing nursing and rearing techniques. The results of this research could ultimately kick-start a new sector of the industry that can help contribute to food security and promote conservation of this important yet threatened fishery.

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