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Sustainable Aquaculture for a Secure Future

Title: Successful Breeding of Sahar *Tor putitora* in Sub-tropical Nepal

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Abstract: Sahar (*Tor putitora*), also known as mahseer, is an important fish species of the torrential waters of the Himalayas. It is a popular, economically important, and high-value indigenous species. Sahar is a game and food fish that is widely distributed in rivers, streams, and lakes (Rai et al. 1997). The price of sahar in the Nepalese market is almost double that of commonly cultivated carps and tilapia. Sahar is captured from lakes and rivers but commercial cultivation has yet to begin in Nepal. This species is declining in its natural habitat mainly because of urbanization, poaching, overfishing, and ecological alterations of physical, chemical, and biological conditions in the natural environment (Bista et al. 2007). Hence, there is a need for conservation of this species. In recent years, successful artificial breeding at some research stations has led to additional enthusiasm towards developing sahar for commercial cultivation, as well as rehabilitation in natural waters (Rai et al. 2006).

Attempts to culture and conserve sahar were initiated in Nepal, with major efforts to develop culture technology and propagate the species (Gurung et al. 2002, Joshi et al. 2002). This has led to better knowledge of spawning biology, ecology, behavior, and preliminary growth performance in captive conditions. Enhanced growth in tropical and subtropical ponds and recent breeding success in hatcheries has raised new hope for the prospects of sahar aquaculture in Nepal (Shrestha et al. 2005, Bista et al. 2001, 2007, Rai 2008). In addition to the culture of fish to adult size for consumption, these new developments can contribute to

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rearing individuals that can be stocked into natural waters to replenish populations there. Its omnivorous and predatory feeding habits make sahar a good candidate to co-culture with mixed-sex tilapia to control tilapia recruits and provide better size at harvest and yield of tilapia (Shrestha et al. 2011). Inclusion of sahar in polyculture of mixed-sex tilapia with carps has enhanced overall fish production in these ponds.

Sahar is an intermittent spawner. It can spawn year-round in Nepal, except during January, under culture conditions. In natural waters, sahar typically migrate a long distance from large rivers to streams for spawning during the monsoon season when rivers and streams are at peak flows. The Fisheries Research Center (FRC) in Pokhara is the key center that produces sahar fry in limited quantity. Demand for sahar fry has increased for restocking rivers and lakes and for aquaculture production. Lack of fry availability is a major bottleneck for commercial production and conservation. The objectives of the study described in this article were to test sahar breeding in the warmer climate of Chitwan, develop protocols for sahar reproduction and mass-scale seed production there, establish nursing and rearing management practices for sahar fry, and make sahar fry available for culture and restocking.

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