DOI: https://doi.org/10.36094/sc.v88.2022.River_Ranching_Programmes_of_Indigenous.Das.406

ARTICLE

Sci. and Cult. 88 (11–12) : 406-409 (2022)

RIVER RANCHING PROGRAMMES OF INDIGENOUS FISH SPECIES OF RIVER GANGA AND THEIR BENEFITS

BASANTA KUMAR DAS[a], HIMANSHU SEKHAR SWAIN[a], SUPRITI BAYEN[a], MITESH HIRADAS RAMTEKE[a], SUBHADEEP DAS GUPTA[a] AND NITISH KUMAR TIWARI[a]

Fish stock augmentation in open water resources is imperative for conservation and restoration of declined fish fauna. It enables in harnessing direct and indirect benefits from the ecosystems on sustainable manner. The technique of river ranching as a method of ex situ conservation has been a newest approach designed and initiatives taken by ICAR- Central Inland Fisheries Research Institute in river Ganga from the year 2016 onwards. Indigenous IMC (Rohu, Catla and Mrigal) bred in captive condition, reared and ranched in depleted waters of the river. The institute has already ranched 56 lakhs fingerlings of IMC's in different sites covering 5 different states of the country.The approach has been first of its kind towards restoring and conserving Gangetic fishes for future.

Introduction

River Ranching is a practice in aquaculture in which, the fish population are maintained in captivity in the first stage of their life cycle, and later they are resealed in a particular ecosystem to maintain and sustain the population without hampering the stock characteristics of native fish fauna. River ranching programme can restore the ecosystem health of inland waters, reduce habitat degradation and conserve aquatic biodiversity, assess ecosystem services as well as maximize socio-economic benefits. This process also ensures the up-gradation of small-scale fisheries in terms of trade and enhances production in the inland fisheries sector. However, there is need to ensure the supply of quality fingerling of the desired fish species for river ranching. ICAR-CIFRI maintained on-field broodstock development and fingerling raising facilities.

The population of Indian major carp (IMC) is declining very drastically due to several man-made and natural factors. In order to increase the stock of IMC in river Ganga, quality seed production is essential from the native IMC stock for conservation. The induced breeding was performed in a controlled condition as it is the appropriate method to get maximum seed production and also it has less competition during grow out stage which helps to maintain a better survival rate. The live fish were collected from different stretches of river Ganga and reared up to maturation to conserve the pure genetic stock. After the maturation, the stocking densities of the brooders in the brood stock pond are maintained at 1500 kg/ha. The breeding programme was scheduled in the monsoon. The selected fishes were kept in a happa for one hour, for acclimatization to the netting stress and then transported to the nearby hatchery. In hatchery, the fishes were weighed and segregated as per their sex (male and female) and released in separate circular cemented tanks for acclimatisation with the environment. The optimum water quality parameters were maintained in the tank. The dosages of Crude Pituitary Extract (CPE) were determined based on the body weight of brooders. During evening hours, the female fishes were injected with initial dose of

a National Mission for Clean Ganga Laboratory, ICAR- Central Inland Fisheries Research Institute, Barrackpore, Kolkata - 700120.

* Corresponding author: basantakumard@gmail.com

CPE @ 2-4 mg/kg body weight through intra-peritoneal injection and were released into the separate tank. After five hours interval, the second dose of CPE was injected to the female fishes @ 6-8 mg/kg body weight and at the same time a single dose of CPE was administered to the male fishes @ 2-4 mg/kg body weight. After five hours of second dose of CPE injection, the stripping was done by gently pressing on the lower abdominal portion of the fishes and eggs and milt were collected in a plastic tray. Immediately after stripping, the eggs and milt were mixed properly for fertilization and transferred to the hatching pool. The fertilized eggs were hatched between sixteen to eighteen hours. The hatchlings were kept undisturbed in hatching pool for three days after hatching. During this period, the spawns would get nourishment from the energy deposited in the egg yolk. After that period, the spawns were collected and stocked in outer cemented cistern for further transportation and stocking in prepared nursery ponds. The produced seed reared up to fingerling size and reintroduced in their natural habitat to the stock enhancement of the river.

Under the ambitious programme of NMCG, New Delhi, ICAR-Central Inland Fisheries Research Institute has been assigned to initiate Scientific River Ranching programme in Ganga River to restore the indigenous prized fish stock since 2016. The first river ranching programme was held at Rishikesh, Uttarakhand involving the local fishers. The systematic planning and ranching programme of the prized fishes of river Ganga has shown considerable impact on the local fishers. A total of 56 lakhs fingerlings of Indian major carps (IMC) and Mahseer (*Tor putitora*) were ranched in five priority states of the Ganga basin viz. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal through conducting a series of 75 ranching programme to sustain. Fish species of commercial and conservation significance viz. Indian major carp (*Labeo rohita, Labeo catla* and *Cirrhinus mrigala*), Calbose (*Labeo calbasu*), Mahseer (*Tor putitora*), Bata (*Labeo bata*), Singhi (*Heteropneustes fossilis*), Giant river prawn (*Macrobrachium rosenbergii*), tengara (*Mystus vittatus*) and sarputhi *Systomus sarana* were ranched in the River. The ranching sites were selected at depleted stretches of river Ganga based on the primary survey, collection of information regarding loss of biodiversity through stakeholder perception, and considering the catch trend to understand the current status of the species and habitat depletion of river Ganga. Besides these, ranching was also conducted at some major pilgrimage areas like *Rishikesh, Dasashwamedh Ghat, Kumbhmela, Sangam, Ayodhya* and *Mayapur*. The details of the state specific programme are presented below;

Uttarakhand

ICAR-CIFRI, Prayagraj regional center, Allahabad in collaboration with State fisheries department officials of Tehri, Uttarakhand have successfully organized the river ranching programme. More than 3,500 Mahseer fish species were ranched at Uttarakhand, covering the areas like Tehri, Rishikesh and Garhwal.

Ranching of Mahseer at Uttarakhand stretch is a conservation drive for restoring biodiversity in the sensistive habitats of the hilly stretch of Ganga. Mahseer (*Tor putitora*) is one of the dominant fish in the Himalayan stretch which are characteristic of the high flow velocities and low-temperature waters. The have been declared as a State Fish of Uttakhand and therefore special attention has been paid for the conservation. Mahseer has a disproportionately large effect on the environment regarding their abundance, and they have been listed as a keystone and indicator species of river Ganga due to their compatibility with the existing ecosystem.

Uttar Pradesh

A total of 28 River ranching programme were organised by the institute in Uttar Pradesh covering Prayagraj, Varanasi, Kausambi, Mirzapur, Sangam, Vindhyanchal, Narwar, and Ayodhya. The recent studies indicate that the abundance of indigenous fish species like Gangetic carp and catfishes are rapidly declining due to invasion of exotics and other factors resulting a high abundance of common carp at Kanpur, Prayagraj, and Varanasi. To restore the population of prized IMC, more than 6 lakh IMC (*Labeo rohita, Labeo catla* and *Cirrhinus mrigala*) and Calbasu (*Labeo calbasu*) were released in the depleted stretches of the river.

Bihar

Invasion of exotic carp *Cyprinus carpio* var. *communis* and Tilapia *Oreochromis niloticus* were noticed at Buxar stretch. As the rising catch of exotic fish triggers severe menace to the important native Gangetic species, ranching of indigenous fish species was carried out.

Jharkhand

More than 5 lakh IMC fish species were ranched at Sahibganj and Maharajpur, Jharkhand for restoration of Gangetic carp (*Labeo rohita, Labeo catla* and *Cirrhinus mrigala*) and Calbasu (*Labeo calbasu*).

Fig. 1 Glimps of River Ranching Programme

West Bengal

A total of 34 river ranching programme were organised at different habitats namely Farakka, Behrampore, Jangipur, Nabadwip, Mayapur, Balagarh, Tribeni, Kalna, Chandannagar, Belur and Barrackpore. Till now, more than 35 lakh indigenous fish species as Bata (*Labeo bata*), Singhi (*Heteropneustes fossilis*), Giant river prawn (*Macrobrachium rosenbergii*), tengara (*Mystus vittatus*) and sarputhi *Systomus sarana* including gangetic carp (*Labeo rohita, Labeo catla* and *Cirrhinus mrigala*) and *Labeo calbasu* were ranched in the river.

River Ranching Programme: Part of Special Day Celebration

Ganga Utsav

On the eve of Ganga Utsav, initiated by the National Mission of Clean Ganga (NMCG), ICAR-Central Inland Fisheries Research Institute fervently celebrated the event in 2021 and 2022. River ranching programme were organised at Barrcakpore to make this event more blissful and fishes combining fingerling and advanced fingerling of Rohu, Catla and Mrigal were released in the river.

Ganga Mashal Yatra

NMCG was carrying forward a 'Ganga Mashal Yatra' flame to connect the people with Ganga and its ecology and local community. The team received at ICAR-CIFRI, Barrackpore on 23rd November 2021. To commemorate this *Yatra*, a river ranching programme was organized which was witnessed of the battalion of the Territorial Army, known as 'Ganga Task Force' to connect people with the Ganga rejuvenation programme. As a part of this ranching programme the local people were sensitized towards the importance of river ranching activity and created awareness regarding conservation and sustainable management of Ganga fisheries.

Conclusion

Ganga River is the natural abode of Indian Major Carps (*L. rohita, L. catla, C. mrigala*) and *L. calbasu* as well as several other native fish species. Several studies reported that the natural population of Indian Major Carp is considerably reduced. As the riverine ecosystem is open access, therefore a planned conservation programme is essential for sustainable exploitation of native stock. The continuous overexploitation of the native fish species might diminish the stock in future if not periodically assessed and managed. Indiscriminate fishing of adult brood stock from the river during peak spawning season needs strict monitoring and control measures. The river ranching will be help in recruitment process and building the stock in the river. However, there is need to ensure the large scale supply of quality fingerling of the desired fish species for river ranching through establishing required species specific infrastuctures. ❐