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Reservoir fisheries of freshwater prawn – success story of an emerging culture-based giant freshwater prawn fishery at Malampuzha Dam in Kerala, India

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The Department of Fisheries of Kerala State in India stocked 600,000 post larvae of the giant freshwater prawn, *Macrobrachium rosenbergii* (also known as 'scampi' in India) in Malampuzha Dam in Palakkad District during September–November 2005 and began harvesting medium and large sized prawns in April 2006. The fishing operations are being done by newly formed fishers Self Help Groups (SHG). The fishers harvest 30-50 kg daily, the large sized prawns sold at about Rs. 300/kg to an exporter at farm gate. This fishery has brought considerably higher income to the 122 tribal and settler fisher families, including 47 SC/ST families (underprivileged communities protected by legislation), in the hill tracts.

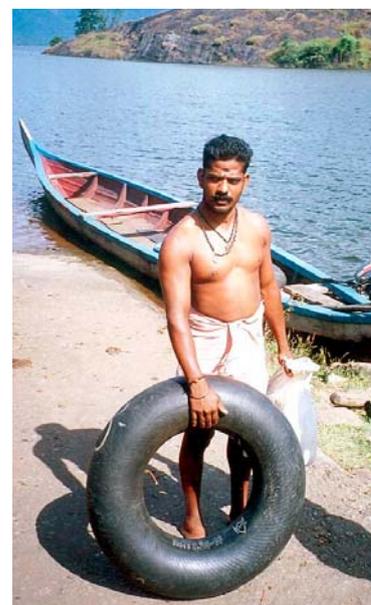
M. rosenbergii is not endemic to the Malampuzha - Bharathapuzha river system, though it occurs in southern Kerala. In the past where Vembanad Lake connected to the Arabian Sea there was a flourishing fishery, now dwindling due to barrage construction, pollution and other anthropogenic factors.

Prior to the formation of the SHGs the tribal people and settlers around the dam were engaged in fishing in the 2,320 ha reservoir (the main objectives of damming the Malampuzha river in

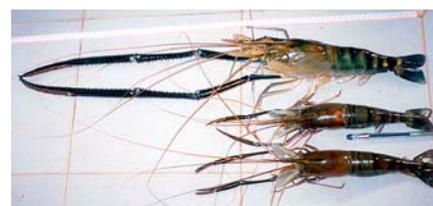
1952 were for irrigation and potable water), but the landings were poor due mainly to poaching and lack of motivation and participation of local fishers. The newly organized SHGs were motivated and cooperative with the participatory approach adopted by the DoF, allowing the 'poachers' to join as SHG members, which had a healthy effect on management and fish yield.

A survey of the reservoir catches conducted on 16/06/2006 showed that until about 10 am 719 kg of finfish (stocked Indian major carps, common carp and naturally recruited wild fishes, mainly minor cyprinids and catfishes) and stocked prawns were landed and sold at the DoF fish sales counter, of which 41.8 kg (fetching Rs 10,450) were from the prawns. *M. rosenbergii* males and females (all berried) caught ranged from 200 to 350 g and 25-30 cm, and about 100-150 g and 20-24.5 cm, respectively.

A total of 53.53 tonnes of fish and prawns amounting to Rs. 14.75 x105 were caught during the year 2005-2006. The average annual production from Malampuzha reservoir for the past 15 years was 3.76 kg/ha, the highest being 9.4 and the lowest 0.07 kg/ha. The production for the year 2005-2006 was 23.14 kg/ha, showing a 20 kg/ha



SHG fisherman using a tire tube as a float to sit on while fishing for prawn/ laying gill nets. Both fish and prawn are caught with the monofilament net of mesh size 12, 15 & 20 cm.



M. rosenbergii from Malampuzha Dam.

Table 1. Small water bodies/multi-purpose ponds used for aquaculture in Kerala with reference to Palakkad District^{1, 2}

Type of water body/pond	Kerala No. & (Area in Acres)	Palakkad No. & (Area in Acres)	Mean size (Acres)		% Total in Palakkad No. (Area in Acres)
			Kerala	Palakkad	
Panchayath (local govt.)	6820 (3,661.73)	633 (401.34)	0.54	0.63	9.3 (11.0)
Temple	2524 (1,039.58)	314 (302.03)	0.41	0.96	12.4 (29.1)
Irrigation	838 (5,022.76)	61 (1,895.49)	5.99	31.07	7.3 (37.8)
Private	36461 (51,539.64)	3070 (2,142.20)	1.41	0.70	8.4 (5.8)
Quarry	904 (818.64)	134 (129.04)	0.91	0.96	14.8 (15.8)
Total	47547 (62,077.02)	4212 (4,870.10)	1.31	1.16	8.9 (7.8)

1. Source: DoF, 2001. Panfish Book - Palakkad District, District Fisheries Data Book, Janakeeya Mathsya Krishi Cell, Department of Fisheries, Kerala, Trivandrum, 382 p.; DoF, 2002. Kerala Fisheries - Facts and Figures. Statistical Wing of the Department of Fisheries, Trivandrum, 212 p.
2. The area units are indicated as given in the source/s (One hectare = 2.44 acre).

Table 2. Reservoirs and irrigation tanks and paddy fields with high potential for freshwater prawn stocking/integration in Palakkad District, Kerala¹.

Water bodies	Number	Area (ha)
Reservoirs/dams:	9	6,683
Malampuzha:		2,313
Mangam:		393
Meenkara:		259
Chuliyar:		159
Pothundy:		363
Walayar:		259
Parambikulam:		2,092
Thunakadavu:		283
Kanjirapuzha:		512
Irrigation reservoirs (not dams):	89	1947
Paddy fields (potential integration - for paddy-cum-prawn culture): ²		124, 000
Padasekarams (collective paddy farming) under seasonal fish culture:		1,235 ha

1. Source: Same as for Table 1.
2. Traditional rice fields in Palakkad (often referred to as granary of Kerala) are now unprofitable and high price prawn integration in the system would improve the socio-economics of the area.

increase over the average production for the last 15 years. The revenue from prawn/fish catch for a single year (2005-2006) was Rs. 1,475,000, which is only 500,000 less than the total revenue of the previous 15 years, clearly indicating the profit margin achieved through prawn stocking and improved participatory exploitation of the reservoir fishery resources.

As on September 2006, i.e. 10 months after stocking, a total of 6,374 kg of prawns were harvested, earning a return of more than Rs. 16,00,000. The total fish catch from April to September 2006 was 26.8 mt, valued at Rs. 693,000.

A return of Rs. 1,600,000 from the stocked freshwater prawns within a 10-month period by spending Rs. 250,000 on stocked prawn seeds, is a remarkable achievement. Adding about Rs. 50,000 as harvesting and other

expenses, the total input cost for scampi culture was only Rs. 300,000, resulting in a cost-benefit ratio of 1:5.3, indicative of a high performance of the reservoir stocking.

The stocked prawns showed exceptional growth, attaining a maximum individual size of 632 g. The large sized prawns caught within 10 - 12 months since the PL stocking, is indicative of healthy conditions for prawn growth in the reservoir during this virgin stocking.

As per DoF/SFG regulations 75% of the total earning from the reservoir catches is distributed to fisher families of Malampuzha, within eight SHGs, and the remaining 25% is deposited in a revolving fund, utilized for stocking of fish/prawn seed and fisher welfare. One Kudumbasree (SHG exclusively of women members) unit consist of five women, is also among the beneficiaries in the DoF project.

One of the major causes of failure of reservoir fisheries and fish culture in Kerala is poaching, which was very prevalent in Malampuzha reservoir as well. Since most of the so called 'poachers' have been included in the SFGs in the scheme, poaching has been controlled, which is a landmark achievement through participatory approach.

Stocking *M. rosenbergii* post larvae in Malampuzha reservoir has yielded significant results. It appears that the new culture-based prawn fishery will be continued, judging also from the earlier smaller trials in smaller Meenkara Dam nearby (see Table 1), where a continuing minor culture-based fishery was established as a project to rehabilitate underprivileged fishers organized into SHGs around its vicinity. There is considerable scope for further development of regular culture based fishery and integrated farming of freshwater prawn in the neighborhood of Malampuzha reservoir in Palakkad District and other parts of Kerala (see Tables 1 & 2). There are 54 reservoirs in Kerala (2 - >5000ha, 13 - 1,000-5,000ha, & 39 - <1,000ha). It must however, be noted that qualitative and quantitative changes in the fish fauna and associated ecosystems in these man-made impoundments and water bodies where such stocking is/will be done, should be reviewed periodically, especially from the point of view of biodiversity changes and sustainability. This calls for development of adequate skilled manpower, especially competent fishery professionals, infrastructure and other facilities by the Government and the private sector with possible assistance from global/regional fisheries/aquaculture development agencies.