

# Fish diversity and fishery yield of major wetlands from Gadhinglaj tahsil of Kolhapur district, (M. S.) India

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## Abstract:

Present study deals with the investigation of fish diversity and fishery potential at eight major reservoirs from the Gadhinglaj tahsil of Kolhapur district, Maharashtra state. The study revealed that total 10 species of fishes were noted at all reservoirs belonging to 8 genuses. During the study period highest species diversity was noted at Narewadi and Vairagwadi reservoirs while lowest species diversity was recorded at Mahagaon reservoir. On the basis of fishery potential, Kumari reservoir has shown highest catch per year while Kadagaon and Mahagaon reservoir have shown lowest fish catch per year. However, based on net profit, fisherman catching fish from Narewadi and Kumari reservoirs earned more profit while fisherman from Mahagaon and Kadagaon earned low profit.

**Keywords:** Fish, diversity, fishery yield, Gadhinglaj tahsil

## Introduction:

Freshwater bodies present a good opportunity for studying the effect of scale on the relative importance of factors that determine diversity on a broad scale. Freshwater bodies are recent and their communities are a combination of species from the former fresh water bodies fish fauna as well as introduced species (Fernando and Holick 1991, Oliveira *et al.* 2004). India is one of the mega biodiversity countries in the world and occupies the ninth position in terms of freshwater mega biodiversity (Mittermeier and Mittermeier, 1997). The Indian fish population represents 11.72 % of species, 23.96% of genera, 57% of families and 80% of the global fishes. Out of the 2200 species so far listed, 73 (3.32%) belong to the cold freshwater regime 544 (24.73%) to the warm freshwaters domain, 143(6.50%) to the brackish waters and 1440 (65.45%) to the marine ecosystem (ICBD1994).

The Chondrichthyes are represented by 131 species under 67 genera, 28 families and 10 orders in the Indian region. The Indian Osteichthyes are represented by 2,415 species belonging to 902 genera, 226 families and 30 orders of which five families, notably the family Parapsilornychidae are endemic to India. The country is endowed with vast and varied resources possessing river ecological heritage and rich biodiversity.

Freshwater fishery sites are varied like 45,000 km of rivers, 1,26,334 km of canals, ponds and tanks 2.36 million ha, 2.05 million ha of reservoirs ( Ayyapan, 2004).

Freshwater habitats are located in different parts of the country especially in rural areas, and are mainly used as source of drinking water, irrigation and for fish production by the local fisherman communities. However, tropical climate of the region create a condition conducive for fast growth of fish (Pailwan *et al.*, 2008). Patil *et. al.* (2015) have studied diversity of pisces and Patil *et al.* (2014) also emphasized on socio economic status of fisherman at various freshwater bodies of Ajara Tahsil of Kolhapur district, Maharashtra. Fishery is one of the important productivity of water bodies. It is an additional source of income to fisherman community. Fisherman community of Bhoi and Bagadi races and Muslim people generally do the fishing. The fishing business of these communities is traditional and from their ancestors. Present study was carried out to reveal the status of fish diversity and earnings of fisherman community at Gadhinglaj Tahsil of Kolhapur district.

### **Material and methods:**

#### **Study Area:**

The major water reservoirs of Gadhinglaj (16° 13' 26" N and 174° 26' 9" E) Tahsil of Kolhapur District from Maharashtra, India plays an important role in the settlement of human as well as providing an ideal habitat to different animal and plant species. These water reservoirs serves them for domestic uses like cloth washing, animal washing, bathing, animal water drinking, agricultural irrigation etc. The water is also used for human consumption from some of the water bodies. This Tahsil is one of the important tahsils of the Maharashtra state. The population is about 216257, distributed in 90 small as well as large villages occupying about 48094 ha of area. Throughout the Tahsil, there are number of small and large water bodies are present along with an important River Hiranyakeshi, which is lifeline of the Tahsil. The people, who are living away from river, are very dependent on these water bodies for their daily needs. The Tahsil is famous for crops like sugarcane, rice, soybean, wheat, chilies and vegetables as cash crops while sorghum, maize, ground nut etc. as minor crops (Sawant *et al.*,2014).

#### **Fish diversity:**

The study was carried out during July 2011 to June 2013 by frequent visit to study sites especially during fish harvesting period and fish were brought to laboratory and identified by referring standard literature (Day, 1958; Jhingram, 1992 and Jayram, 2010).

#### **Fishery potential:**

The economic status was studied by personally interviewed fisherman during July 2016 to June 2017. Interviews were conducted for fisherman as the number of fisherman is limited for fishing activity is carried out through the process of lease. Hence, Individual fisherman was interviewed.

## Results and discussion

The present study revealed that fishing activity was noted in all tanks and reservoirs except Karambali. The occurrence of fishes at study sites is given in Table 1 while Economic status of fisheries is given in Table 2 and 3.

The fishery potential of Shendri tank was analyzed during present study and it has been observed that 2 lac finger limbs were released into this tank mainly belonging to carps like Rohu, Catla, Mrigal and Silver while naturally occurring fishes such as *Barbus minor* and *Punctius arulius* were also recorded. This tank was taken on the lease basis by Shendri Co-operative fishing Society Ltd, Shendri and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 8 tons. However, gross earnings from this activity is about INR 4, 80,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 2,30, 000. Hence the net profit from fishing activity is approximately INR 2, 50, 000.

The fishery potential of Yenechavandi tank was analyzed during present study and it has been observed that 2 lac finger limbs are released into this tank mainly belonging to carps like Cyprinus, Rohu, Catla, Mrigal and Silver while naturally occurring fishes such as *Punctius ticto* and *Punctius arulius* were also recorded. This tank was taken on the lease basis by Chaloba Co-operative fishing Society Ltd, Harali-Khurd and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 8 tons. However, gross earnings from this activity is about INR 4, 80,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 2,32, 000. Hence the net profit from fishing activity is approximately INR 2, 48, 000.

The fishery potential of Terani tank was analyzed during present study and it has been observed that 3 lac finger limbs are released in to this tank mainly belonging to carps like Cyprinus, Rohu, Catla and Mrigal while naturally occurring fishes such as *Labeo porcellus*, *Chana gachua* and *Punctius arulius* were also recorded. This tank was taken on the lease basis by Chaloba Co-operative fishing Society Ltd, Harali-Khurd and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 9 tons. However, gross earnings from this activity is about INR 5, 40,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 2, 87, 000. Hence the net profit from fishing activity is approximately INR 2, 53, 000.

The fishery potential of Narewadi tank was analyzed during present study and it has been observed that 3 lac finger limbs are released in to this tank mainly belonging to carps like *Cyprinus*, Rohu, Catla, Silver and Mrigal while naturally occurring fishes such as *Labeo porcellus*, *Chana gachua* and *Barbus minor* were also recorded. This tank was taken on the lease basis by Matshakanya Co-operative fishing Society Ltd, Harali-Khurd and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 9 tons. However, gross earnings from this activity is about INR 6, 00,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 2, 90, 000. Hence the net profit from fishing activity is approximately INR 3, 10, 000.

The fishery potential of Vairagwadi tank was analyzed during present study and it has been observed that 1 lac finger limbs are released in to this tank mainly belonging to carps like *Cyprinus*, Rohu, Catla, Silver and Mrigal while naturally occurring fishes such as *Labeo porcellus*, *Chana gachua* and *Barbus minor* were also recorded. This tank was taken on the lease basis by Matshakanya Co-operative fishing Society Ltd, Harali-Khurd and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 2 tons. However, gross earnings from this activity is about INR 1, 20,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 80,000. Hence the net profit from fishing activity is approximately INR 40,000.

The fishery potential of Kumari tank was analyzed during present study and it has been observed that 3 lac finger limbs are released in to this tank mainly belonging to carps like Catla, Silver and Mrigal while naturally occurring fishes such as *Chana gachua* and *Barbus minor* were also recorded. This tank was taken on the lease basis by Bhairavnath Co-operative fishing Society Ltd, Kanadewadi and royalty is paid to Government authorities per year INR 10,000. The average yield of fish per annum is about 10 tons. However, gross earnings from this activity is about INR 6, 00,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 3, 05,000. Hence, the net profit from fishing activity is approximately INR 2, 95,000.

The fishery potential of Kadagaon reservoir was analyzed during present study and it has been observed that 20000 finger limbs are released in to this tank mainly belonging to carps like Rohu and Mrigal while naturally occurring fishes such as *Chana gachua* and *Punctius ticto* were also recorded. This tank was taken on the lease basis by Kalbhairav Co-operative fishing Society Ltd, Bhadgaon and royalty is paid to Government authorities per year INR 1,000. The average yield of fish per annum is about 0.6 ton. However, gross earnings from this activity is about INR 30,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 19,200. Hence the net profit from fishing activity is approximately INR 10,800.

The fishery potential of Mahagaon tank was analyzed during present study and it has been observed that 20,000 finger limbs are released in to this tank mainly belonging to carps like Rohu and Mrigal while naturally occurring fishes such as *Labeo porcellus* were also recorded. This tank was taken on the lease basis by Matshakanya Co-operative fishing Society Ltd, Harali-Khurd and royalty is paid to Government authorities per year INR 1,000. The average yield of fish per annum is about 0.6 tons. However, gross earnings from this activity is about INR 30,000 among which expenditures such as lease amount, finger limb purchase and transportation, Net charges and harvesting charges etc. is about INR 19,500. Hence, the net profit from fishing activity is approximately INR 10,500.

The finger limbs are released during monsoon season of every year while harvesting is carried out from November to May at all tanks and reservoirs. The frequency of harvesting is once or twice in a month. The present study also revealed that the fishing activity is not carried out at Karambali tank as the government authorities have not given on lease basis.

**Table 1:** Distribution of fishes at study sites

S. No.	Name of Species	Sd	Yn	Tr	Nr	Vg	Ku	Kd	Mh
01	<i>Catla catla</i>	+	+	+	+	+	+	-	-
02	<i>Cyprinus carpio</i>	-	+	+	+	+	+	-	-
03	<i>Cirrhinus mrigala</i>	+	+	+	+	+	+	+	+
04	<i>Labeo rohita</i>	+	+	+	+	+	-	+	+
05	<i>Hypophthalmichthys molitrix</i>	+	+	-	+	+	+	-	-
06	<i>Labeo porcellus</i>	-	-	+	+	+	-	-	+
07	<i>Puntius arulius</i>	+	+	+	-	-	+	-	-
08	<i>Punctius ticto</i>	-	+	-	-	-	-	+	-
09	<i>Chana gachua</i>	-	-	+	+	+	+	+	-
10	<i>Barbus minor</i>	+	-	-	+	+	-	-	-

**Note:** Sd- Shendri, Yn- Yenechavandi, Tr-Terani, Nr-Narewadi, Vg-Vairagwadi, Ku-Kumari, Kd-Kadagaon, Mh- Mahagaon, + - present, - - Absent

**Table 2: Economic status from fishery at study sites**

Tanks/ Expenditure	Shendri	Yenechavandi	Terani	Narewadi
Lease Amount (INR)	10000	10000	10000	10000
Finger limbs	80000	80000	120000	120000
Transportation (INR)	10000	12000	15000	15000
Net charges (INR)	10000	10000	12000	10000
Harvesting Charges (INR)	120000	120000	135000	135000
Yield in tons	8	8	9	9
Wholesale income (INR)	480000	480000	540000	600000
Net profit (INR)	250000	248000	253000	310000

**Table 3: Economic status from fishery at study sites**

Tanks/ Expenditure	Vairagwadi	Kumari	Kadagaon	Mahagaon
Lease Amount (INR)	10000	10000	1000	1000
Finger limbs	30000	120000	8000	8000
Transportation (INR)	5000	15000	1200	1500
Net charges(INR)	5000	10000	1500	1500
Harvesting Charges (INR)	30000	150000	7500	7500
Yield in tons	2	10	0.6	0.6
Wholesale income (INR)	120000	600000	30000	30000
Net profit (INR)	40000	295000	10800	10500

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