

Reservoir Fisheries of Orissa State, Southeastern India

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Background

Orissa State has about 256 000 ha of reservoir waters. At present, about 197 000 ha of 1 442 reservoirs are suitable for fish production. These reservoirs, constructed primarily for water storage, irrigation, flood control and for generating electricity, include three large reservoirs, accounting for 119 400 ha; and six medium-sized reservoirs, ranging from 1 094 to 3 500 ha each. The remainder are small, 7 to 900 ha each. In the future, the reservoir area is expected to increase due to construction of new dams for irrigation. Reservoir fisheries development is still in its infancy and has not yet reserved adequate attention. The reservoirs support mainly small-scale fisheries and are rich in their diversity of fish species. In addition to native fish species, the introduction of catla, rohu, mrigal and exotic carps—grass (*Ctenopharyngodon idella*), silver (*Hypophthalmichthys molitrix*) and common (*Cyprinus carpio*)—is also being made. The native species include *Labeo calbasu*, *L. fimbriatus*, *L. bata*, *Cirrhinus reba*, *Puntius sarana*, *P. sophore*, *Satipina phaja*, *Rasbora* spp., *Macrobrachium rosenbergii* and *M. malcolmsonii*. Catfishes like *Clarias batrachus*, *Heteropneustes fossilis*, *Wallago attu*, *Aorichthys seenghala*, *Aorichthys aor*, *Notopterus notopterus*, *Chitala chitala*, *Channa striata*, *C. orientalis*, and *C. punctata* also occur.

Table 1. Fry stocking in the reservoirs of Orissa.

Year	No. of reservoirs	Area (ha)	Fry stocked (millions)	Fry stocked/ha
1985-86	37	63 159	8.4	134
1986-87	33	135 805	9.9	73
1987-88	38	62 726	20.4	326
1988-89	71	54 215	64.2	1 184
1989-90	70	131 217	57.5	438
1990-91	63	125 776	64.5	513
1991-92	61	122 510	65.6	536
1992-93	39	46 557	36.4	781

Stocking Program

Most of the reservoirs provide excellent habitats for raising fish. However, some are infested with weeds and are not productive. Stocking of Indian major carp fry in some of the reservoirs to boost fish production began in 1985-86. Fry have been stocked by the Orissa Fish Seed Development Corporation (OFSDC) and by the Department of Fisheries in a few reservoirs from 1985 onwards. The stocking rate is erratic and varies from 73 to 1 184 fry/ha (Table 1). Only a few reservoirs are stocked every year. Nonavailability of quality fish seed for reservoirs is a major constraint to fisheries development. There is a high demand for seed by fish farmers and only leftover seed is released into the reservoirs. During 1992-93, production of seed in the State from all sources (Government, private and OFSDC hatcheries) was about 200 million, but only 36 million were stocked in reservoirs.

The yearly fish production from reservoirs of Orissa and its contribution to total freshwater fish production are presented in

Table 2. The water area used for aquaculture (ponds and tanks) was 79 000 ha in 1992-93. The reservoir area is 2.5 times larger but reservoir fish production was only 7% of that from ponds and tanks.

The reservoirs are under the administrative control of the Irrigation Department. However, the fishing rights of 65 reservoirs, totaling 147 807 ha, have been transferred to the Department of Fisheries. Thirty reservoirs, having a total area of 64 525 ha, were placed under control of OFSDC, but during 1992-93, the number was reduced to 23 totaling 33 899 ha.

The State Government's urge to use small irrigation reservoirs for fisheries development will bring a new era in fish production. Hopefully, in the next few years, the State will witness a high production of fish from reservoirs due to a World Bank-aided project that commenced in 1992-93. This will operate up to 1998 and includes training for members of the primary fishers' cooperative societies (PFCS) on fingerling culture in pens and fishing techniques. Fifty-five reservoirs of total area 19 600 ha located in 15 different districts are included

Table 2. Fish production from reservoirs, ponds and tanks; and the contribution of reservoir fish production to total freshwater fish production of Orissa.

Year	Reservoirs (t)	Ponds and tanks (t)	All freshwater sources (t)	Percentage of reservoir fish production in to total fish production (%)
1985-86	1 392	24 271	31 221	4.5
1986-87	1 400	25 833	32 791	4.3
1987-88	2 000	33 200	41 000	4.9
1988-89	2 500	36 865	45 365	5.5
1989-90	3 000	41 000	50 500	5.9
1990-91	3 150	49 275	58 720	5.4
1991-92	3 307	55 345	65 118	5.1
1992-93	4 192	58 966	70 829	5.9

in this project. The PFCS will be provided with loans to procure boats, nets, pen enclosures and for construction of rearing ponds.

Future Needs

Limnological and ecological studies are needed for scientifically based management. Removal of predatory and nonfood fish is essential to ensure maximum survival of stocked fry. Rearing fish seed to advanced

fingering stage in pens at suitable sites in reservoirs, and subsequently releasing them into the reservoirs, would reduce predation and ensure higher survival rate. Hence, hatcheries should be set up for production of fish seed near reservoirs. Judicious exploitation of waterbodies and implementation of conservation measures would promote high fish yields. If necessary, chemical fertilizers and/or organic manure may be applied in small reservoirs to increase the forage for filter-

feeding fish. As in China, integration of fisheries with animal husbandry and agriculture may be profitable in small reservoirs.

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AQUABYTE NEWS ITEMS

IAGA List Server

Dr. Brendan J. McAndrew invites the aquaculture genetics community to join the International Association for Genetics in Aquaculture (IAGA) list server. This list server has been set up to stimulate discussion and provide a vehicle for information exchange for those who are involved in the application of genetics to the management and improvement of aquatic organisms. People can join the list by subscribing directly as the system will automatically detect and use the correct mail address. Messages must be short and relevant to the community that the list will serve. To join, send the e-mail message:

To: mailbase@mailbase.ac.uk
Subject: (can be left blank)
Text of message: join aqua-genetics
(your name) stop

To contribute to the list discussions once you have joined, send:

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Text of message:
A recent study by ...

Messages will be sent to all those who have supplied their e-mail address on the conference application form, and from the participants' list of IAGAV. For further inquiries, please contact: Dr. B.J. McAndrew, Institute of Aquaculture, University of Stirling, Stirling FK9 4LA, Scotland, UK. Tel: 467884; Fax: 473211.

Internet-Aquaculture

Internet Aquaculture could be the ultimate coffee break for aquaculturists with their own computers, according to Nigel Robbins of the Canadian Aquaculture Institute at the University of Prince Edward Island. If you are on E-Mail and interested in aquaculture, you can try the daily discussions on production techniques, animal health, statistics/research, education, technical hints, finance, nutrition and meeting announcements on AQUA-L, the International Electronic Aquaculture Discussion List. Who is on Aqua-L? Fish farmers (finfish and shellfish), scientists, educators, government administrators, suppliers-people from all aspects of this global industry.

Right now there are several hundred subscribers from 36 countries. However, in spite of the many interesting topics which are

discussed through the list, Aqua-L is a low volume network - usually about two to seven entries a day. As the list increases in subscriptions and usage, this is expected to rise to about 20. There is no cost to subscribe. To join the Aquaculture Discussion List send an E-Mail message to: LISTPROC@UPEI.CA. Put this message in the body of your message: SUB AQUA-L Your Name. Note that 'Your Name' means your proper name and not your user identification or E-Mail address 'name'. LISTPROC extracts your identification and E-Mail address from your message header. If you are unfamiliar with lists and/or LISTPROC, add the following plea to your message: HELP. How do you use Aqua-L? Simply address your E-Mail message to: AQUA-L@UPEI.CA. Further information: contact Nigel Robbins NROBBINS@UPEI.CA or Ted White (the originator of Aqua-L) WHITET@MALA.BC.CA

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