

Fish Production Trends in Certain Reservoirs - A Study in the North Telangana Districts of Telangana State

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Abstract: *In the present study an attempt has been made to study the Ichthyo fauna diversity and fish production in some reservoirs in Northern Telangana districts during the year 2012 to 2014. North Telangana Zone includes the five districts i.e Adilabad, Karimnagar, Nizamabad, Medak(except southern borders) and Warangal (except western portion and N.W. Part), North-eastern tips of Nalgonda and Khammam (most parts of Khammam).In North Telangana Zone Karimnagar district has the maximum number of reservoirs (10) followed by Nalgonda (9), Nizamabad (6), Warangal (5) districts. Nalgonda, Karimnagar have large concentration of small reservoirs. Medium reservoirs are well dispersed among the districts and 4 large reservoirs are distributed among Karimnagar and Nizamabad district. Majority of the reservoirs in the North Telangana Zone are small (24), followed by those in the medium (12) and large (04) as suggested by Srivastava et al., [3] and Anon, [14]. In the present study the fish yield has been estimated for the consecutive years (for a period of two years from 2012-2014). It is observed that the fish production has increased from 1, 48,799tonnes to 1, 86, 960 tonnes where as the fresh water prawn production was decreased from 3,229 tonnes to 1,881 tonnes. However in order to increase fish production there has been an increase of pressure on these water bodies that leads to ecological imbalance, it is observed.*

Keywords: Inland fish, Reservoir fisheries, Fish culture, Fisheries development, Yield optimization.

1. Introduction

In India, fresh water bodies occupy an area of 1.37 million hectares in which more than 2, 44,000 hectares are under fish culture [1]. Indian fisheries are an important component of the global fishery with India being a sixth largest producer of fish amounting to 3.39 mmt, playing an important role in Asian fisheries and aquaculture scenario. India produces over 2.44 mmt from the inland fisheries sector, being at the second position in the world. Indian fisheries has rich resources of 1, 31, 334 kms of rivers and canals [2]. From 1984 to1999 aquaculture production expanded from 7 million to 33 million metric tones. Now growing more than 220 species, aquatic farmers are providing one third of worlds total food fish supply. By the year 2030 more than half of all fish consumed will come from aquaculture says the FAO.

Fisheries sector contributes significantly to the national economy while providing livelihood to approximately 1449 million people in the country. It has been observed and recognized as powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food besides being a source of foreign exchange earner. Most important it is the source of livelihood for a large section of economically backward population of the country. Although Telangana State (Part of the united Andhra Pradesh) stands in the second position in Inland fish production in India. In order to increase fish production all the existing water resources in the state both the natural and man-made are being utilized for fisheries development. Reservoirs being the major water bodies therefore these water bodies receive special attention to take up the fisheries and also for yield optimization.

Reservoirs or man-made lakes constitute an important Inland fishery resource of India. Reservoirs were generally

classified as small (<1,000 ha), medium (1,000 to 5,000 ha) and large (75,000 ha). Small reservoirs differ significantly from the large and medium ones. In large reservoir, fisheries management lays emphasis on establishing relatively self-sustaining populations more or less on capture fishery norms, while small reservoirs essentially requires a stocking and recapture policy on an annual basis which is more akin to extensive aquaculture system.Telangana and Andhra Pradesh have a long tradition of constructing big dams and reservoirs. Some of the oldest man-made lakes in the country are situated in the state. Srivastava et al., [3] have listed 117 reservoirs, along with their areas at FRL and the fish production rate. However, a recent communication from the state Fisheries Department mentions only 102 reservoirs. Andhra Pradesh has 98 small reservoirs, 2,800 tanks, 32 medium reservoirs on 7 large reservoirs with a total surface water area of 458507 ha.

The northern part of Telangana is mountainous receiving an annual rainfall of the order of 102 cm. In the south, the terrain is undulating with isolated hills and an average precipitation of only 50 cm a year. The State is a hot, semi-arid dry land, except the coastal districts which are very fertile and have a highly productive agriculture.Andhra Pradesh is drained, by three large rivers (catchment< 20 000 km²), including the Godavari and Krishna, which have an annual discharge of 105 000 and 67 675 million m³ respectively. Pennar, the third major river carries 3238 million m³ annually. The medium rivers (catchment 2001 – 20 000 km²) comprising Nagavali, Sarda, Eluru, Gumdlakamma, Musi, Paleru, Muneru and Kunleru have an annual discharge of 6 430 million m³.

2. Material and Methods

Telangana is a state in the Southern region of India. It has an area of 114,840 km² and is the twelfth largest state in India.

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Most of it was part of the princely state of Hyderabad (Medak and Warangal Divisions), ruled by the Nizam of Hyderabad during the British Raj, joining the Union of India in 1948. On 2 June 2014, Telangana was separated from Andhra Pradesh as a new 29th state of India, with Hyderabad as its capital. Telangana is bordered by the states of Odisha and Chhattisgarh to the north, Maharashtra and Karnataka to the west, and the residuary Andhra Pradesh to the south and east. Telangana has an area of 114,840 square kilometres (44,340 sq mi) and a population of 35,286,757 (2011 census). Telangana is a semi-arid area and has a predominantly hot and dry climate. Summers start in March, and peak in May with average high temperatures in the 42 °C (108 °F) range. The monsoon arrives in June and lasts until September with about 755 mm (29.7 inches) of precipitation. A dry, mild winter starts in late November and lasts until early February with little humidity and average temperatures in the 22–23 °C (72–73 °F) range. The fresh water bodies that were surveyed during the present investigation are mainly on certain small reservoirs in North Telangana Zone includes the Districts of Adilabad, Karimnagar, Nizamabad, Medak (except southern borders), Warangal (except western portion and N.W. Part), North-eastern tips of Nalgonda and Khammam (most parts of Khammam).

Fishes were collected personally by using nets and the help was also taken from the local fishermen. The fish were collected from the landing sites along the tank soon after they were caught. They were brought to the laboratory for their identification and they were then preserved in 10% formalin for further observation. The fishes were identified up to species level following the standard procedures in the literature [4] - [13].

3. Results and Discussion

In North Telangana Zone Karimnagar district has the maximum number of reservoirs (10) followed by Nalgonda (9), Nizamabad (6), Warangal (5) districts. Nalgonda, Karimnagar have large concentration of small reservoirs. Medium reservoirs are well dispersed among the districts and 4 large reservoirs are distributed among Karimnagar and Nizamabad district. Majority of the reservoirs in the North Telangana Zone are small (24), followed by those in the medium (12) and large (04) categories. The four large reservoirs have a total surface area of 1,10,477 ha, while the medium and small reservoirs cover 25,970 ha and 8769 ha respectively. Taking the irrigation tanks in to the account the total number and area is much higher. Irrigation tanks of Telangana are classified in to two categories, viz., perennial and long seasonal [14]. Although an inventory of all perennial tanks in the State is not available their number and area by districts are known. More than half of the perennial tank is situated in Nizamabad district in North Telangana, both numerically and in terms of water spread. Reservoirs and tanks together constitute large amount of water area in North Telangana Zone.

Fish fauna varies with food spectrum of the aquatic system. The small reservoirs by virtue of dominant planktonic food chain harbour combination of plankton feeding fishes like *Amblypharyngodon mola*, *Gadusiachapra*, *Puntius* spp.,

Gambusia affinis, *Chelabacaila*, *Osteobramacotio*, *Esomus danrica*, *Ambasis nama* and *A. ranga*. Big sized carnivorous fishes viz., *Wallago attu*, *Mystus* spp., *Channa* and the major carps like *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala* and *Labeo calbasu* are also found. Many reports were published on reservoir, canal and tank fisheries. Authors like Mohanty [15] described the development of reservoir fisheries in Orissa. Sinha [16] reported present status and future potentialities of fisheries in North Eastern region of India. So many researchers are also worked on fisheries of reservoirs [17] - [19], and reviewed the fisheries development in Andhra Pradesh [20] [21].

Fish spectrum is conspicuously different in shallow water ecosystems. Despite the high organic deposition, the fish fauna includes very few of the detritivores due to the unfavourable habitat. Fishes in these systems mainly belong to small planktivores and carnivorous species such as *Channa punctatus*, *C. marulius*, *C. gachua*, *C. striatus*, *Nandus nandus*, *Glossogobius giuris*, *Xenentodon cancila*, *Notopterus notopterus* and air-breathing fishes like *Anabas testudineus*, *Heteropneustes fossilis* and *Clarias batrachus*. Reservoirs have rich species diversity. Kanwate and Kulkarni [22] studied fish and fisheries of Kandhar tank, District Nanded Maharashtra. Battule *et al.*, [23] studied fish diversity from Ekrukhlake near Solapur, Maharashtra. Karnataka. Rathode *et al.*, [24] studied fish diversity of Umra reservoir, Wasim district, Maharashtra. Ravindar [25] studied biodiversity of fishes in Dharmasagar reservoir, Warangal District, Andhra Pradesh.

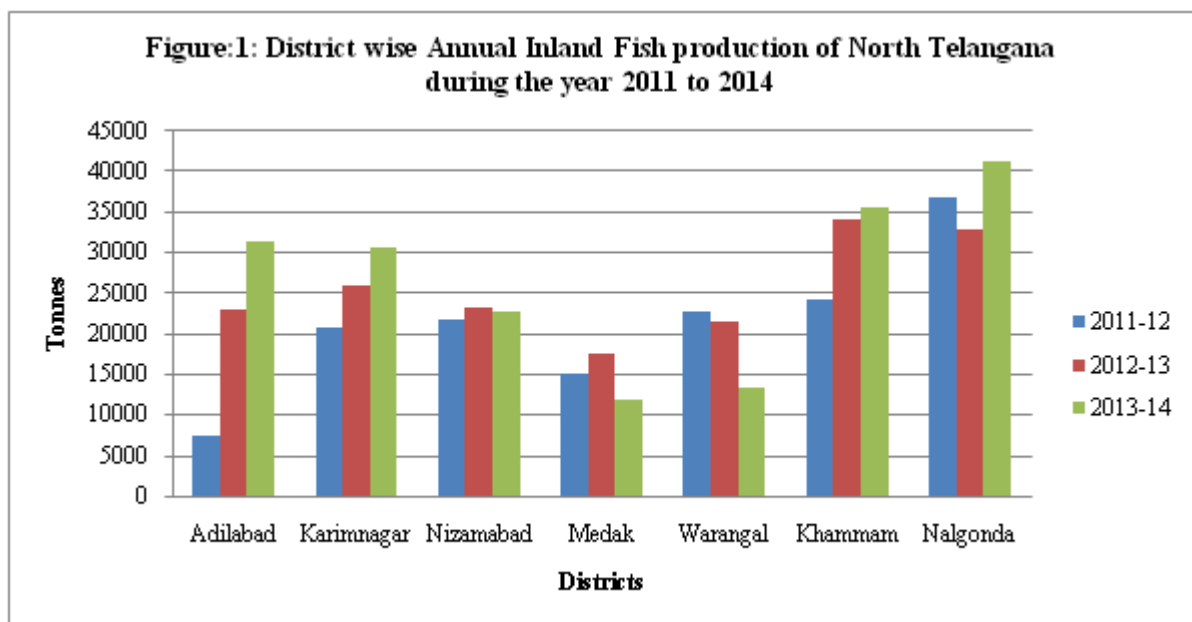
Fish yield in reservoirs fluctuates widely depending on the fish fauna and food spectrum, recruitment potentialities and overall habitat. These factors vary from one system to the other resulting in variation of the yield pattern. The average annual yield from reservoirs ranges between 150 and 350 kg/ha. This low fish production is attributable to the fish spectrum dominated by the small sized planktivores and carnivores. In reservoirs, the annual fish yield fluctuates between 250 and 475 kg/ha. The species contributing to the fish production are planktivores, detritivores and omnivores. Medium reservoirs yield fish at high rates of 500 to 1,000 kg/ha/yr.

The Inland fish production in North Telangana districts is mainly from reservoirs, perennial tanks, village tanks and farmer dugout ponds. From all the resources the district Khammam produced 24,250, 34,084 and 35,585 tonnes of fresh water fish during the year 2011-12, 2012-13 and 2013-14 respectively. This district always stood in first position in fish production as well as fresh water prawn production also (Table – 1 and Figure-1).

Apart from the reservoirs and tanks, the Adilabad district produced least quantity of fish and prawn production in these three consecutive years. Warangal produced 22781, 21,436 and 13,300 tonnes of fish and 689, 748 and 262 tonnes of prawn production during the year 2011-12, 2012-13 and 2013-14 respectively (Table – 1). The fish production mainly consists of Carps, Cat fishes, Murrels, Barbus, Hilsa and other miscellaneous groups. The Carps dominate with 70-80% of the production followed by Cat fish and Murrels.

Table: 1 showing district wise Annual Inland Fish and Fresh water Prawn production of North Telanganaduring the year 2011 to 2014 (Production in Tonnes)

Sl. No.	Name of the District	Inland Fish Production				Fresh Water Prawn Production			Total
		2011-12	2012-13	2013-14	Total	2011-12	2012-13	2013-14 (Provisional)	
	Adilabad	7360	22900	31455	61715	375	841	230	1446
	Karimnagar	20775	26014	30628	77417	238	1034	295	1567
	Nizamabad	21645	23270	22704	67619	340	400	306	1046
	Medak	15180	17627	11986	44794	0	362	77	439
	Warangal	22781	21436	13300	57517	689	748	262	1699
	Khammam	24250	34084	35585	93919	731	932	328	1991
	Nalgonda	36808	33000	41302	111110	856.5	369	383	1609
	Total	148799	178331	186960	514090	3229.5	4686	1881	9796.5



As Pillay [26] emphasized, in order to enhance the fish production in inland waters to cater the food requirement of the people, efforts have not been made in this direction. The average annual fish yield in Indian reservoirs can be increased to 75 kg/hectare per year during 1981[27].

The reservoir fish productivity was much higher in China than that of India. In China the productivity is 60 kg/hectare per year in large reservoirs, 225 kg/hectare per year in medium reservoirs and 1000 kg/hectare per year in small reservoirs having less than 500 hectares of water spread area. This level of yield must have been achieved only under intensive monitoring. When compared to reservoirs of China, the productivity of Indian reservoirs is also low [28]. As Mahaptra [29] recorded only 15.6 kg/hectare per year in Hirakud reservoir and 5-10 kg/hectare per year in other major reservoirs of Orissa. It was observed that there was scope to increase yield rate @ 100 kg/hectare per year, provided proper management practices are adopted. However the present fish yields from the reservoirs in Telangana remain high with 150 kg /hectare and above per year.

The fishing methods practiced in reservoirs are traditional. Gill nets, scoop nets, seine nets, encircling nets and lifting nets are deployed depending on the requirements and suitability of their operation. Gill and lift nets are intensely operated in large and medium reservoirs while traps and scoop nets are the principal gear in small reservoirs.

The reservoir resource of the State is enormous and diverse in ecological characteristics. For proper management, they need to be classified on the basis of ecological and production characteristics. However, there is an urgent need to conserve these water bodies and protect them from environmental degradation due to anthropogenic activities. Reopening or excavation of the linkages wherever possible is one of the prime needs.

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