Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 2389-2394

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-11 pp. 2389-2394**
Journal homepage: http://www.ijcmas.com

Original Research Article

Present Status of Freshwater Fishery Resources in Uttar Pradesh, India

Dinesh Kumar[1], Ashish Kumar Maurya[2], Vipin Mishra[3*], C. P. Singh[1] and Laxmi Prasad[1]

[1]Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh-224 229, India
[2]Department of Fisheries, Karnataka Veterinary Animal and Fisheries Sciences University, Mangalore, 575 002, India
[3]Krishi Vigyan Kendra West Kameng Dirang Arunachal Pradesh, India
**Corresponding author*

A B S T R A C T

Uttar Pradesh is the most populated state and blessed with vast potential of aquatic bioresources that exhibit rich genetic and vivid freshwater fish diversity that contributes nearly 14.68% of Indian fish biodiversity. Fisheries resources are in the form of network of rivers and rivulets, reservoirs, network of irrigation canals, ponds, lakes and extensive floodplain wetland. Rivers and canals comprise one of the most valuable fisheries resources of the state with total length of 39,542 km. Uttar Pradesh has a total of 94 reservoirs with an estimated area of 1, 47,552 ha out of which 64 reservoirs are managed by fisheries sector (area, 64,889.87 ha.). Revenue ponds has an area of 1,50,482.50 ha, fisheries department tanks has 1,530.44 ha, Irrigation department ponds has 16,725.58 ha and Private ponds has 5,172 ha in the state. Quality seed and nutritionally balanced feed are considered to be most important requirements for practicing aquaculture. Presently there are 251 hatcheries aimed to provide quality fish seed to farmers. Along with this 77 feed mill are in operation in the state to meet the feed requirement in the state. Observing the importance of nutritional security, employment generation and uplifting the economic and social status of fisherman and fish farmers and for sustainable exploitation of the available resources an attempt has been made to study the available fresh water resources, their potential to boost the fish production, future possibilities and the pattern of fish production in the state.

Keywords

Fishery, Uttar Pradesh, Resources and production

Introduction

Uttar Pradesh (UP) is the most populated state and blessed with vast potential of aquatic bioresources that exhibit rich genetic and vivid freshwater fish diversity (Pathak *et al.,* 2019). UP contributes nearly 14.68% of Indian fish biodiversity and offers considerable scope for inland fisheries development and aquaculture (Lakra, 2010). Major fisheries resources mainly consist of rivers and rivulets, reservoirs, irrigation canals, ponds and floodplain wetlands (Department of Fisheries, UP, 2013). Aquaculture is mainly practiced in un-drainable simple excavated multi-purpose ponds (Department of Fisheries, UP, 2013).Pond water is a primary unit of inland fish production (Dwivedi *et al.,* 2004; Jha *et al.,* 2015). Ponds are shallow water bodies of standing water (Whitfield *et al.,* 2004). Wild ponds are rich in plankton biodiversity

compared to managed ponds (Roy, 2012). These water bodies are also providing huge food security and livelihoods of peoples globally (Jha *et al.*, 2015: Das *et al.*, 2016).

It has been reported that nearly 55% of the fishing community is engaged in capture fisheries (Lakra, 2010). In view of the significance to improve socio-economic condition fisherman community and to achieve sustainable utilization of resources for fisheries development, optimum production of fish from water bodies, employment generation, availability of protein rich food, appropriate planning for conservation and management strategies are of utmost importance (Lakra, 2010).

Demand of fish in Uttar Pradesh is 15 lakh metric tonnes (15kg/ capita/ year for 54% fish eating population of the State) against the total production of 4.9 lakh metric tonnes (NFDB Newsletter, 2016).

The availability of vast and varied fisheries and aquaculture resources are currently unutilized or underutilized and have tremendous scope to improve the rural livelihoods while improving the food and nutritional security of UP (Department of Fisheries, UP, 2013). The objective of the present study is to provide an overview of the freshwater fishery resources available in the state for their proper utilization and management to increase the fish production.

Materials and Methods

The present study was based on the secondary data collected from various sources which mainly includes Handbook of Fisheries Statistics, 2018, published by Department of Fisheries, Government of India, Official website of Fisheries Department of Uttar Pradesh and from people of Department of Fisheries, Uttar Pradesh.

Results and Discussion

Fishery Resources

Despite the fact that Uttar Pradesh is a landlocked state it is blessed with enormous freshwater resources that have great potential to enhance the aquaculture production(Maurya *et al.*, 2018). Fisheries resources are in the form of network of rivers and rivulets, reservoirs, network of irrigation canals and extensive floodplain wetland(Department of Fisheries, UP, 2013). Aquaculture is mainly practiced in un-drainable simple excavated multi-purpose ponds (Department of Fisheries, UP, 2013). Ponds are considered as prime unit of inland fish production. The various fisheries resources of Uttar Pradesh are mentioned in Table 1.

Rivers and canals form one of the most valuable fisheries resources of the state with total length of 39,542 km (Department of Fisheries, UP, 2020). These rivers are the original abode of the most valuable inland fish species including Indian major carps, the backbone of Indian aquaculture. Riverine fisheries support a large number of traditional fishers living in the vicinity and engaged in fishing and other allied activities (Department of Fisheries, UP, 2013). A sharp decline in fish catch from rivers has been observed in last few years.

Reasons for decline in catch may be attributed to introduction of exotic species, indiscriminate fishing, pollution, anthropogenic activities and climate change. To manage and conserve the resource from further decline and to prevent reaching an irreversible state rivers deserve rehabilitation of stock through several interventions including river ranching, for restoration of habitat and introduction of effective enforcement, and introduction of responsible

fisheries with active participation of fishing communities(Department of Fisheries, UP, 2013).

Reservoirs are the major freshwater fisheries resources in country. These open water bodies hold tremendous potential for optimizing the fish production in the country. India has 19,134 small reservoirs, 180 medium reservoirs and 56 large reservoirs with a total area of 3.54 million ha which offers single most important inland fisheries resource for the country in terms of resource size and production potential (Handbook of Fisheries and Aquaculture, 2011). Uttar Pradesh has a total of 94 reservoirs with an estimated area of 1, 47,552 ha (Department of Fisheries, UP, 2020). There are 64 reservoirs managed by fisheries sector in the state having an area of 64,889.87 ha. Small reservoirs (40-200 ha area) are maximum in Balrampur, Chitrakoot and Behraich with area 347.52 ha, 330 ha and 306.34 ha respectively (Department of Fisheries, UP, 2020). Small reservoirs (200-1000 ha area) are maximum in Mirzapur, Mahoba and Jhansi district with area 2235 ha, 2192 ha and 1790 ha. Medium reservoirs (1000-5000 ha area) are maximum in Chandauli, Banda and Sonbhadra with area 4575 ha, 2592 ha and 2296 ha respectively (Department of Fisheries, UP, 2020). Sonbhadra has maximum area of large reservoirs of 37325 ha. The current average fish from reservoir is poor, only 15 kg/ha/y. Development of reservoirs can be achieved through supplementary stocking with quality fingerlings of Indian Major Carps; creation of adequate rearing space for ex-situ/in-situ production of quality fingerlings for stocking; introduction of Co-management regime for the management of reservoir fisheries by involving fishers as active partner in planning, implementation and decision making process bringing all the reservoirs under scientific fisheries management practices; leasing of reservoirs on long-term; and continuous programme for HRD of reservoir fisheries managers and fishers (Department of Fisheries, UP, 2013). Following these actions it is anticipated that annual fish yield will increase to 400 kg, 300 kg, 100 kg and 50 kg for small –A, small-B, medium and large reservoirs respectively thereby increasing the total fish production from reservoirs (Department of Fisheries, UP, 2013).

Ponds are considered to be the most suitable sites for aquaculture purpose. Aquaculture has huge potential for development through both expansion and intensification (Department of Fisheries, UP, 2013). In the state, revenue ponds has an area of 1,50,482.50 ha, fisheries department tanks has 1,530.44 ha, Irrigation department ponds has 16,725.58 ha and Private ponds has 5,172 ha (Department of Fisheries, UP, 2020). Raibarely, Hardoi and Barabanki districts have maximum area of Revenue ponds i.e. 7090.74 ha, 6666.29 ha and 6484.02 ha respectively. Fisheries Department Tanks are maximum in Mahoba, LakhimpurKhiri and Unnao district with area 157.25 ha, 151.08 ha and 124.21 ha respectively. Private ponds are maximum in Pratapgarh, Behraich and Balia district with area 365.69 ha, 334.93 ha and 235.22 ha respectively (Department of Fisheries, UP, 2020). Presently there are 59 Recirculatory Aquaculture System (RAS) sites are in operation in the state. 835 ha area in the state is under Pangasius farming(Department of Fisheries, UP, 2020). As per Department of Fisheries, UP,(2013), Out of the 1.61 lac of community ponds out of which1.46lacs ha community ponds are suitable for fish culture only 70,000 ha are presently used for aquaculture. There is scope for using the remaining 91,000 ha of community ponds after undertaking renovation and improvement.

Table.1 Fisheries resources of Uttar Pradesh

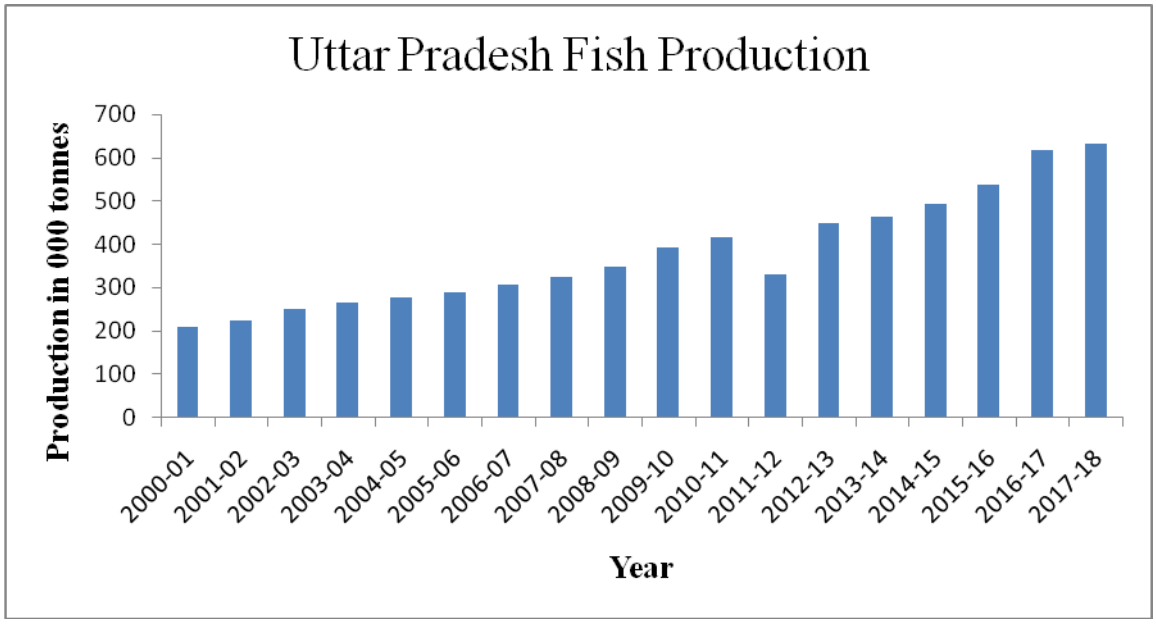
S. No.	Resource	Area	Number
1.	Rivers and Canals	39,542 km	-
2.	Other than rivers and canals	25351.00 ha	-
3.	Reservoir	1,47,552.00 ha	94
4.	Reservoir managed by fisheries sector	64,889.87 ha	64
5.	Aquaculture Ponds		
	a. Revenue ponds	1,50,482.5 ha	202499
	b. Fisheries department tank	1,530.44 ha	303
	c. Irrigation department ponds	16,725.58 ha	84
	d. Private ponds	5,172.00 ha	7404
6.	Oxbow lakes	12,034.00 ha	-
7.	Fish hatcheries	-	251
8.	Total feed mill	-	77

Source: Handbook of Fisheries Statistics, 2018
Department of Fisheries, Uttar Pradesh, 2020

Table.2 Fish production in Uttar Pradesh

S. No.	Year	Production (000' tonnes)
1.	2000-01	208.3
2.	2001-02	225.4
3.	2002-03	249.8
4.	2003-04	267.0
5.	2004-05	277.07
6.	2005-06	289.58
7.	2006-07	306.73
8.	2007-08	325.95
9.	2008-09	349.27
10.	2009-10	392.93
11.	2010-11	417.45
12.	2011-12	329.72
13.	2012-13	449.75
14.	2013-14	464.48
15.	2014-15	493.189
16.	2015-16	537.936
17.	2016-17	617.694
18.	2017-18	632.22

Fig.1 Figure showing fish production in Uttar Pradesh



These aquaculture ponds can be used as potential source to increase the fish production of the state. There are huge tract of water logged areas which are suitable for construction of fish culture ponds and farms by private sector. About 60,000 ha of additional fish culture ponds can be developed in water logged areas including 10,000 ha for culture of new species, under private sector (Department of Fisheries, UP, 2013). Oxbow lakes have an area of 12,034 ha in the state and are potential source of aquaculture in the state (Handbook of Fisheries Statistics, 2018).

Quality seed and nutritionally balanced feed are considered to be most important requirements for practicing aquaculture. To meet the seed requirement in the state presently there are 251 hatcheries aimed to provide quality fish seed to farmers (Department of Fisheries, UP, 2020). Earlier to this Department of fisheries (2013) reported that there are 209 carp hatcheries in the state including 19 under DoF or related agencies which produce about 1400 million fry annually. Rampur, Kushinagar and Maharajganj districts have maximum number of fish hatcheries i.e. 36, 32 and 21 respectively. Along with this 77 feed mill are in operation in the state to meet the feed requirement in the state. Mau, Sitapur and Gazipur has maximum number of fish feed mill i.e. 7, 5 and 5 respectively (Department of Fisheries, UP, 2020).

Fish Production in Uttar Pradesh

Fish production in the state is increasing continuously with the current production being 632 thousand metric tonnes. Continuous growth is observed in the fish production for several years with a slight decline in the year 2011-12 (Maurya *et al.*, 2018). Culture fisheries share the major portion of fish production compared to capture fisheries. Fish production in the last few years is given in Table 2.

From the present study it can be concluded that Uttar Pradesh has vast and varied inland fisheries and aquaculture resources that can be utilized for fish production. Reservoirs and rivers are found to be the most unexplored

resources that when utilized properly are capable of uplifting the fish production in the state. Aquaculture in ponds is mostly practiced in the state. Quality fish seed and feed are found to be basic requirements for practicing aquaculture. To make Uttar Pradesh leading inland fish producing state there is urgent need to establish hatcheries for production of quality fish seeds and to establish feed manufacturing units for obtaining good quality feed (Maurya *et al.*, 2018). Fishes with higher growth rate and adaptation to the environment can help in boosting fish production of the state. Significant decline if fish production has been observed from rivers as a result of growth overfishing, recruitment overfishing, destructive fishing, degradation and loss of natural habitats and entry of exotics in the inland waters. Strict enforcement of rules and regulation can help in sustainable exploitation of rivers(Maurya *et al.*, 2018).

References

Das SCS, Pathak RK, Khan A, Joshi KD (2016) Assessment of fecundity and gonado-somatic index of pond reared *Cirrhinus mrigala* (Ham. 1822). *J Inland Fish Soc India* 48: 32-36.

Department of Fisheries, Government of Uttar Pradesh, 2020.Ayyappan S, Moza U, Gopalakrishan A, Meenakumari B, Jena J. K, Pandey A K(2011). Handbook of Fisheries and Aquaculture. Second Edition. New Delhi, Indian Council of Agricultural Research.

Dwivedi AC, Tewari NP, Singh KR (2004). Present structure of capture and culture fishery of the Faizabad District (U.P.). *Bioved* 15: 95-98.

Handbook of Fisheries Statistics, (2018) Government of India, Ministry of Fisheries, Animal Husbandry and Dairying.

Jha DN, Joshi KD, Dwivedi AC, Mayank P, Kumar M (2015). *J. Kalash Sci* 3: 7-10.

Lakra WS. Fish Biodiversity of Uttar Pradesh: Issues of Livelihood Security, Threats and Conservation. National Conference on Biodiversity, Development and Poverty Alleviation, 2010.

Lakra, W S (2010) Fish biodiversity of Uttar Pradesh: issues of livelihood security, threats and conservation. In: National Conference on Biodiversity, Development and Poverty Alleviation (May 22, 2010). Uttar Pradesh State Biodiversity Board, Lucknow, 40–45.

Maurya A K, Upadhyay A D, Prasad L and Khan S (2018). Trend analysis of fish production in Uttar Pradesh, India. *J. Entomol. Zool. Stud*6(4): 180-184.

Newsletter of the National Fisheries Development Board. 2016; 7(5):1-64.

Pathak A K, Sarkar U K, Dayal R and Singh S P (2019). UPF Base—A freshwater fish diversity database of Uttar Pradesh, India. *Indian J. Anim. Sci* 89(3): 347–354.

Roy K (2012). Qualitative plankton diversity of a fish culture pond and a wild village pond of Chhattisgarh, South Central India. *Glob. Res. Anal* 2: 13-14.

Vision and Perspective Plan for Development. Department of Fisheries, Government of Uttar Pradesh, 2013.

Whitfield M, Biggs J, Bray S, Fox G, Nicolet P (2004). Comparative biodiversity of rivers, streams, ditches and ponds in an agricultural landscape in southern England. *Biol. Conserv* 115: 329-341.