

Traditional Knowledge Associated with Fishing Practices of Ramnagar, Nainital District, Uttarakhand

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Abstract: Uttarakhand Himalaya is known with its rich coldwater fish diversity and bio-resources. Ethnobiological study was conducted in Ramnagar region, Nainital district of Uttarakhand which reveals their Traditional Knowledge associated with fishing practices of Kyashap community along the Ramganga River. Fishing is one of the important sources of livelihood for the community people of Ramnagar region. The Kyashap community has developed several traditional fishing methods, locally known as *Gahan*, *Fass*, *Dolabujana*, *Kadiyali*, *GherJal*, *Herbs*, *Mahajaal*, *Hooks* and *Dynamiting*. It was found that most of these methods are suitable for local circumstances of the region.

Key words: Traditional Fishing Practices • Kumoan Region • Indigenous Knowledge • Ethnobiology
• Uttarakhand

INTRODUCTION

Kumaon region is situated in the central Himalayan region in Uttarakhand, with an area of 21, 035 Km². The Uttarakhand Himalayas has unique and diverse genetic resources and associated Traditional Knowledge (TK). The Nainital district of Uttarakhand covering an area of 3, 860 Km² is bounded on the north by the Almora and on the south by the Udham Singh Nagar districts [1]. Ramnagar is a small town settled in 1856 located 65 Kms from the Nainital district of Kumoan region, the ancient name of Ramnagar was Ahichhatra the capital of Northern Panchala of Mahabharata times [2]. Two main river systems drain Kumoan region, these are Kali and Ramganga (Fig. 1). They are a part of the Ganga drainage basin. The Sarju River is the largest tributary of the Kali River draining Kumoan. The Ramganga River is an important tributary of the Sarju River. It rises from a small glacier on the South-Eastern slopes of the Garhwal-Kumoan water divide and the Ramganga River system drains South-Western Kumoan. A total of 258 coldwater fish species belonging to 21 families and 76 genera are listed for the Indian Himalayan region [3]. Subsistence

and commercial fisheries exploit the larger fish, such as the cyprinids *Labeo dero*, *Tor putitora*, *Barilius bendelisis* and *Schizothorax richardsonii* as well as *Garra gotyla*, *Pseudoecheneis* spp., *Mastacembelus armatus* and *Crossocheilus latius*. The other fishes are smaller and of low economic value. Fish production in streams is low and therefore, commercial fishery is on a low scale only. Sport and recreational fishery targets the native mahseer, *Tor putitora*.

Ramganga and Kosi rivers passing through the Ramnagar area are quite rich in genetic resources and its coldwater fish biodiversity. Local Kyashap community employs a number of unique fishing practices based on indigenous knowledge system passed on by their ancestors to catch fishes for their livelihood security. Since Uttarakhand is a hilly state, some of the fishing techniques applied in other parts of the country are not suitable in the hilly rivers and streams, therefore, the local natives have developed several indigenous fishing methods to suit their unique stream system. In view of the above, an attempt has been made in this paper to describe community fishing practices followed by the villagers in Ramnagar area of Uttarakhand.

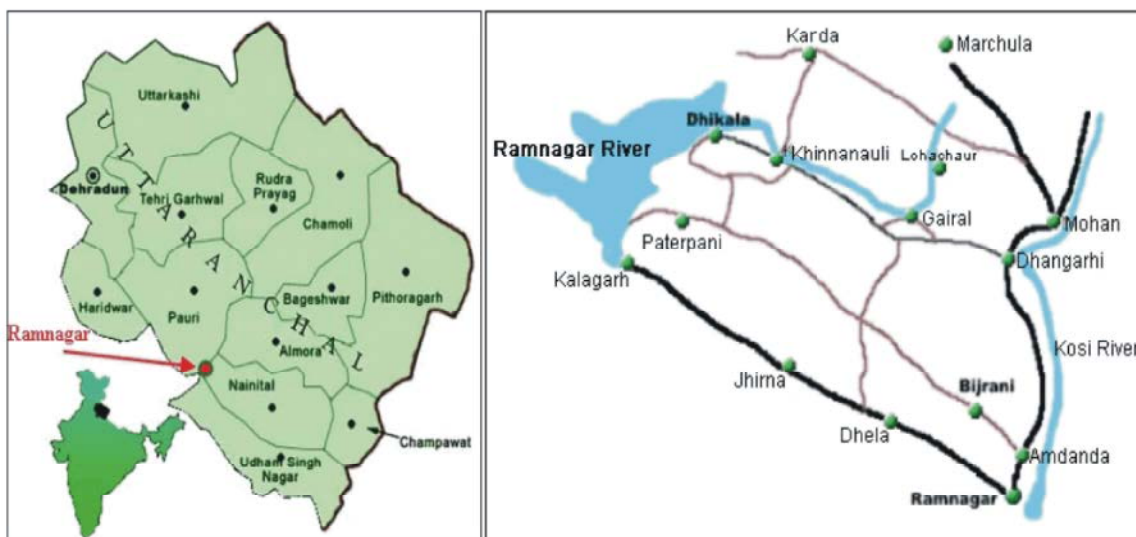


Fig. 1: Location map of the study area

MATERIALS AND METHODS

The study was conducted in Mohan, Kumaria and Sunderkhal Villages of Ramnagar tehsil under Nainital district, Uttarakhand during June, 2015 (Fig. 2 a&b). The Ramnagar Range villages have population of 2103, of which 1088 are males while 1015 are females. The fishing community mostly belongs to Kyashap community. Ramganga River flows by the lower stretch of villages. Information on fishing methods was collected through intensive field survey in the above mentioned villages along the Ramganga and Kosi rivers. Participatory and

informal Interaction with villages along the local fishermen and prominent citizens from these villages were conducted for studying the use and operation of the fishing practices and methods employed for catching fishes from these hill streams and their catch composition. The majority of fish species reported were: *Tor putitora* (locally mahseer), *Barilius bendelisis*, *Schizothorax* spp (locally Asela), *Garra gotyla*, *Acanthocobitis botia*, *Tor chylenoides*, *Labeo dero*, *Puntius* spp., *Mastacembalus armatus* (locally baam) and *Nemachelius* spp. etc., (Fig. 3a &b). The information collected was compared with the existing information in the literature.



Fig. 2: Ramganga River sampling site: (a) Fishing at Mohan village (b) Fishing at Kumaria village.



Fig. 3: Fishing during sampling at Ramganga River: (a) & (b) Fish species collected during sampling

RESULTS

Kyashap community uses various indigenous knowledge associated to fishing methods to catch fishes. The study aims that this knowledge should be documented, protected and valued as this is our legacy for the future and wealth for the present. Among the various methods of fishing, only a few are documented in the literature [4, 5]. These methods can be broadly classified as conventional, commercial, destructive and recreational (Fig. 4). Various kinds of methods show traditional knowledge of people on resource available to catch and their strategy and knowledge of ecosystems biodiversity. Some of the important indigenous fishing methods, documented in the study are as follows:

Gahan (Hammering): The coldwater fishes use the boulders as one of its hiding covers. When a strong blow is given on the boulders using a hammer, the fishes hiding beneath it are injured. The injured fishes will appear out and float on water surface including the small sized are collected. Commonly used for Loaches, Asela and *Garra* spp.

Fass (Knot Method): The *Fass* consists of a nylon rope or sometimes handmade thin thread with several knots at regular intervals. The diameter of the knots ranges from 5-15 cm, while the length of the nylon rope ranges from 10-25 m. The nylon rope with knots is fastened to submerged rocks or boulders on both ends across the stream. Fishes moving in the streams get trapped in these knots. It is put during night time where water velocity is

high and fishes are collected the next morning. The sizes of the fishes caught range from 0.5-2.5 kg and commonly used for *Schizothorax* spp. (Asela) and *Tor putitora* (Mahseer).

Dolabujana (Water Diversion Method): This method is used where two river streams merge at a common point. The water current of one stream is diverted to the other by blocking with mud, boulders and plants. Subsequently, the fishes are collected from the stream. This method is skillful in fast moving water habitats of the hilly streams. Most of the fish collected include small sized bottom dwelling fishes like *Garra gotyla*, *Barilius barna*, *Nemacheilus* spp., *Barilius bendelisis* and *Mastacembelus* spp. (Fig. 5a).

Herbs: Community fishing is a big significant event in all over the Uttarakhand including Mohan and Kumaria villages (Ramnagar). People celebrate it as a social/religious festival. In this event Timur powder (*Zanthoxylum armatum*) and Rambans (*Agave americana*) etc., are used to catch various sizes of fishes. These plant products are first well grinded and thereafter, applied to pools and streams. These herbal products are well mixed with the mud to make the stream water turbid. After its application, the fishes come to the surface and become unconscious. The faint fishes are collected by the fishermen using simple cloth [6, 7].

Cast net (GherJal): The cast net is a widely used fishing gear all across India. In Ramnagar area, the local fisherman used handmade cast net locally named as Gol jal or Gher

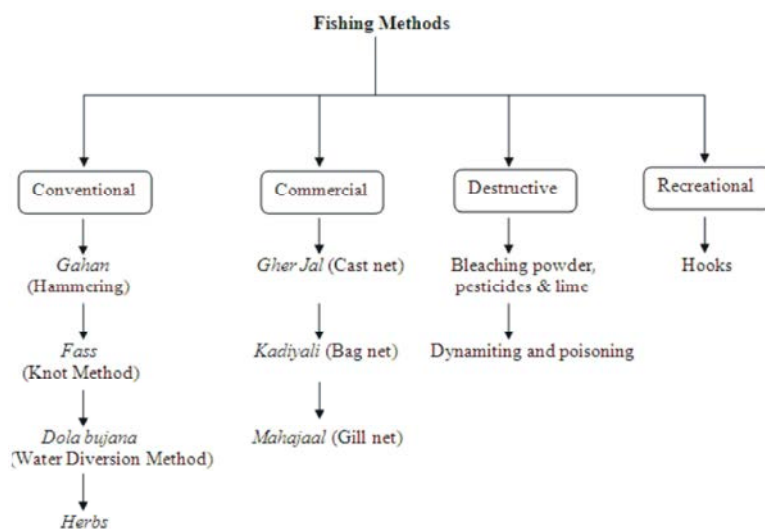


Fig. 4: Classification of fishing methods used in Ramnagar region

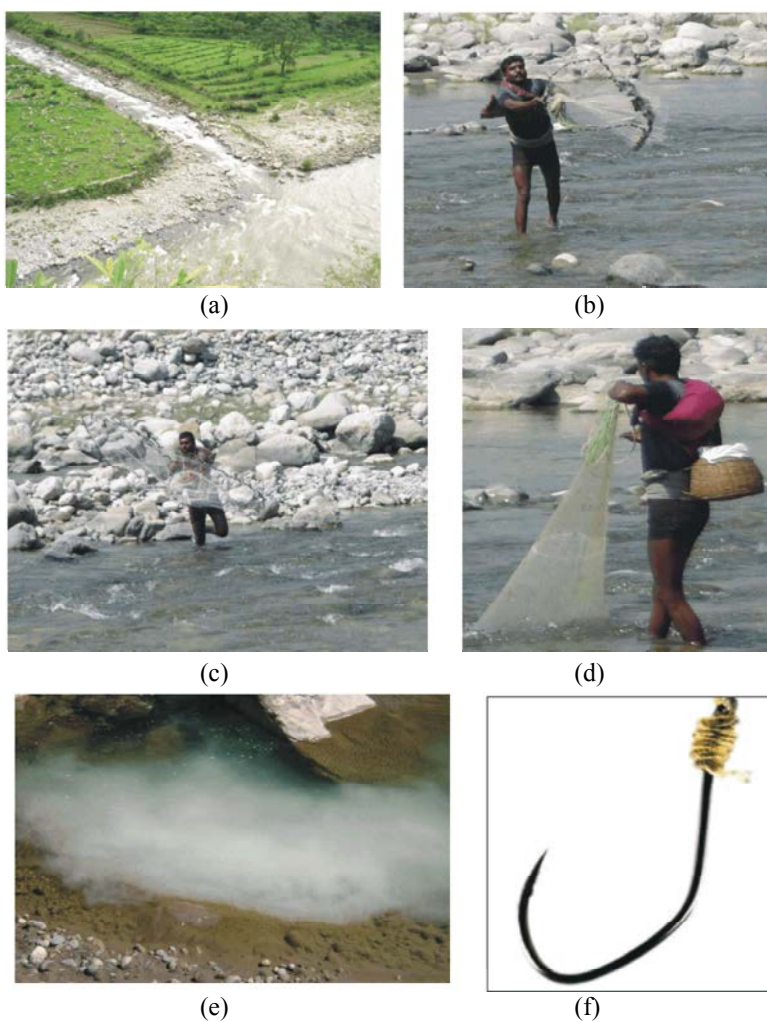


Fig. 5: Fishing methods: (a) Dola bujana; (b), (c) & (d) Gher Jal; (e) Bleaching powder; (f) Hooks

Jal, while moving upstream or downstream. In this area, the fishermen catch fishes mostly in morning times after sunrise. The diameter of the cast net ranges from 1-2 m and the mesh size is from 1-5 cm. On the edge, heavy metallic round shape sinkers are attached and towards the apex of net long nylon thread is attached to make the net sink and to withstand the flow of streams. After throwing the net, the fishermen disturb the bouldery substrate so that the fishes hiding behind the rocks come out and get trapped in the net (Fig. 5b&c). Caught are collected in the round bamboo basket fixed to fisherman waists (Fig. 5d). This is commonly used for *Garra gotyla* (Patarchatta), *Barilius bendelisis* and *Schizothorax richardsonii* (Asela), etc.

Kadiyali (Bag Net): It is pyramid shape handmade net used for catching the small fishes. The mesh size of these nets ranges from 1-5 cm resulting to catch the small fishes. Fishermen use it during night hours with the torchlight. The method is practiced in shallow pools and riffles where the fishermen can move.

Mahajaal (Gill Net): The gill nets are locally known as *Mahajaal* or sometime as *Patti Jal* also. This Mahajaal is mostly applied in the stagnant water or deep pools in the river streams. It is made up of nylon silk, 10 m long and stretched mesh size varying from 5-8 cm. The fishermen normally carry out this method during the evening and morning times. It is commonly used for big fishes. In Ramnagar area, it is mostly used to catch *T. putitora* (Mahseer), *Labeo dero* and *Bagarius* spp. (Goonch). They are placed across the stream by means of rope fastened at the banks.

Bleaching Powder, Pesticides & Lime: Bleaching powder, pesticides and lime are the chemicals easily available in the Kumaon region, used to kill fish species. Soon after its application the fishes come to the water surface. Commonly used pesticides are Nuvan, Thiodon and Malathion. These pesticides are applied in high concentrations to the areas with high probability of catching fishes (Fig. 5e). The application of pesticides not only damages the ecosystem but also affects the health of human beings.

Dynamiting and Poisoning: This is very commonly used method in the Kumaon hill stream and, is one of the major reasons for the decline in the number of fishes in the region. It is used for large-scale fishing in this region. The poison used may be of plant derivatives or synthetic

chemicals. The fishes killed by these methods are said to be fit for human consumption, though studies are needed in this direction.

Hooks: In this method a thin bamboo rod tied with cotton thread fixed to a sharp metallic hook are used for fishing. Commonly used to catch small fishes like loaches and *Puntius* spp. etc. Generally, earthworm and wheat flour is used as bait to attract fishes. This hook and line fishing is most widely used method both in stagnant and running water bodies (Fig. 5f).

DISCUSSION

The study results show that fishing practices and gears along the Ramganga and Kosi Rivers are mostly traditional or non-mechanized in nature and make use of traditional rafts and wooden manual boats. The majority of the fishermen were part-time, who are also engaged in multiple activities such as fruits production and daily labors to sustain their livelihoods. The study also showed that fish contribute to livelihood security by both serving as a major food item and by providing cash income ultimately used for the purchase of a variety of goods and services. It was also found that fisherman were mainly focusing on one type of fish, due to its high demand and high price i.e., Mahseer. This could be one of the main reasons for this fish (*T. putitora*) coming under the endangered status. Other reasons mentioned one of the most economically important game fish for decline of (Mahseer) in the Kumaon region, was environmental degradation of the habitat and various deleterious developmental activities along with poaching, overexploitation of resources and indiscriminate fishing in the area [8].

CONCLUSION

During the study we find a traditional paradox "leave it or lose it" relationship between the community people and aquatic diversity, which has positive or negative effects. If community people leave their indigenous methods or fishing practices, the TK become extinct in the near future and if we lose the fishing community to continue their practices like this without any law or regulations, the future of aquatic life and genetic material in the Ramnagar area of Himalayan region, particularly in Ramganga River, may turn out to be endangered. Though, Uttarakhand lies in the one of the richest biodiversity hotspot region, due to anthropogenic

activities a number of fish species appears to be declining at an alarming rate. Very little research has been done from outside the state and no intensive study from the natives in this direction. The conservation of aquatic life is addressed only by the fisheries protection act (Uttarakhand Fisheries Act, 2003), which prohibits the use of illegal or unmanaged practices in the region and defines concrete administrative penalties, civil liabilities and responsibilities.

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