



Chapter 22

Recreational Fisheries and Resource Conservation

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1.0 Introduction

Terminologies such as recreational fishing, angling, recreational angling, leisure fishing, hobby fishing and sport fishing are used interchangeably to describe recreational fishing. Recreational fishery is considered as an activity that does not include sale of fish while some suggest that part of recreational fishery catch could be sold for financial gain but should constitute an insignificant part of the person's income. A simple definition of recreational fisheries as coined by European Commission is 'all fishing activities not conducted for commercial fishing purposes'. Recreational fishing mainly differs from commercial fishing in view of the fact that the former is primarily for enjoyment or recreation or adventure against the latter for production of food, for monetary benefits and for employment.

2.0 Importance

There are 118 maritime countries around the world where recreational fishing takes place. The estimated recreational anglers around the world in 2003 was 58 million spending a total of 39.7 billion US \$ generating 0.954 million jobs. The total annual catch by recreational fisheries was estimated at 47 billion fish in 2004, which comes to 12% of total world catch.

Recreation fishing is the most fascinating outdoor physical activity as it gives amusement and recreation. It is important in terms of social, employment and economic aspects. It does not have competitive spirit and therefore does not arise the question of stress or strain.

Recreational fishing gives immense pleasure and mental peace to the angler without involving any risk factor associated with many other marine recreational activities like diving, kayaking and swimming with wild dolphins. Thus this is an ideal leisure time activity for the young as well as senior citizens.

Unlike many other commercial fishing activities, recreational fishing does not disturb the biodiversity or adversely affect the ecological balance. Recreational fishing normally does not produce noise or disturb the ecosystem. It generally preserves biodiversity and wildlife due to non use of electronic gadgets, noise or disturbance. It also conserves resources by releasing the catch back into the system.

The economic benefits of sports fishing are both direct and indirect. The direct benefit refers to the money directly spent by the sport fishers while the indirect benefits can be the employment and the number of personnel engaged in it. The money, sport fishers spend result in a sizeable employment viz., employment in fishing unit, agents, managers, fishing implement suppliers and manufactures and travel and food sectors associated with it.

3.0 Types of recreational fishing

Recreational fishing methods range from fly fishing to the modern high-tech fishing from modern vessels targeting marlin and tuna. Recreational fishing is broadly divided into two, fresh water and marine. Fresh water recreational fishing is mainly conducted in rivers, pools, bays and cold water streams. The main target species are mahseer, trout, snow-trout, carp and catfish. Marine recreational fishing is conducted in open seas and beaches. Sea angling started in late 1800 along with the invention of motor boat. USA, Australia, New Zealand, Hawaii etc. were the countries where this game started initially. Later, as more powerful and large vessels were made available the endeavour grew up and spread to Asian maritime countries where fishery close to shores was available. Marine recreational fishing is present in 76% of the world's Exclusive Economic Zones (EEZ). The target group of fishes are snappers, groupers, tunas, marlins and marine cat fishes.

Recreational fishing is diverse in terms of the diverse catching implements used like spear, rifle, rod and line, pots, small nets or bare hands. However, it mostly refers to angling, the activity of catching fish on hooks using rod and line or hand held line. This is due to the challenge of finding and catching the fish associated with angling. Thus often recreational fishing is termed as 'angling'.

Based on the fishing equipment and methods, there are four basic types of recreational fishing practices. They are spin fishing, fly casting, bait casting and jigging. Spin fishing is an angling technique where a spinning lure is used to entice the fish to bite. Spin fishing is used in both freshwater and marine environments. Two types of reels are used in spin fishing viz., open faced reel and closed faced reel. In spin fishing rod, there is no trigger attached to the base of the fishing rod unlike in bait casting fishing rod. The effectiveness of spinner and lure are governed by weight, colour, and actions of the lure and the speed of retrieval by the angler. The common freshwater target species are trout, salmon, perch and

bream. In fly fishing an artificial 'fly' is used to catch fish. The fly is thrown into water, using a fly rod, reel, and specialized weighted line. Fly fishermen use hand tied flies that resemble natural invertebrates or other food organisms, or 'lures' to attract the fish to strike. Fly fishing can be done in fresh or salt water. Techniques for fly fishing also differ with habitat like lakes and ponds, small streams, large rivers, bays and estuaries and open ocean. Bait casting involves presenting live or dead baits in a variety of ways to attract and catch fresh water or marine fishes. The bait, cut into pieces is attached on hook. The main baits used are small fishes, shrimps and crabs. The bait rigs are used in various combinations of terminal tackle -hooks, leaders, swivel, beads, sinkers etc. A single hook attached to the main fishing line is the simplest rig of all and is normally quite effective. Jigging is a fishing technique, which involves fishing with a special type of lure to attract the fish or prey. A jig consists of a lead sinker with a hook molded into it and usually covered by a soft body to attract fish. Jigs are intended to create a jerky, vertical motion. The jig is very versatile and can be used in both salt and fresh water. Many species are attracted to the lure which has made it popular amongst anglers.

4.0 Recreational fishing in India

India has ample scope for recreational fishing with about 40 indigenous and exotic fresh and saltwater fishes, which are some of the finest game fishes in the world, besides having a vast stretch of fresh, brackish and marine waters. The country has about 50000 km of fresh water bodies viz., river, streams and lakes. All major rivers are easily accessible and are near major cities. In addition, India has around 8000 km of coastal area inclusive of two beautiful groups of islands, Andaman and Nicobar islands and Lakshadweep on the east and west coasts.

The major river stretches and rivers suitable for fresh water recreational fishing are Himalayas, Satpuras, Aravallis and high ranges of Munnar and Nilgiris along the western ghats. The major rivers of the northern India which support sport fishery are Ganga, Yamuna, Sutlej, Brahmaputra and tributaries of these. In the southern side, Mahanadi, Cauvery, Krishna and Godavari are the best angling location throughout the year.

5.0 Fresh water game fishes

Mahseer: The largest of the carp and minnow family, the mahseer includes a number of different sub-species such as the red-finned mahseer, the yellow-finned mahseer and the copper mahseer. The largest can weigh up to 220 kg, and are capable of putting up a very stiff fight. Mahseer is known as the tiger of the Indian rivers and is the greatest fighting fish in the world. Mahseer is a migratory fish and is having the habit of running up for spawning during monsoon season. The angling of mahseer is an adventure, where every cast could be a potential strike. The main species are *Tor putitora* (golden mahseer), *Tor tor* (turiya mahseer), *T.khudree* (Deccan mahseer), *T.mussalah* (Mussalah mahseer), *T.mosal* (copper Mahseer), *T.progenious* (Jungha mahseer), *Neolissohilus hexagonalepsis* (chocolate boakar).

Trouts: Both rainbow trout and brown trout are introduced to Indian waters, by British more than hundred years ago. The main trout species found in India are *Salmo trutta fario* (brown trout), *Onchorynchus mykiss* (rainbow trout). The distribution pattern of trouts in India is Kashmir, Himachal Pradesh, Sikkim, Kerala Tamilnadu, and Uttarkashi.

Snow trout: The snow trout is found in high altitude streams and lakes in India and exhibits many potential qualities of game fish. The main species are, *Schizothoracichthys esocinus*, *S.planifrons*, *S.progastus* and *Schizothorax richardsonii*. These species are mainly found in Ladakh, Kashmir, Jhelum, Ganga, Assam, N.Bengal and Sikkim.

Carps: Carps are mainly used for food purpose, but some species of carps are very good game fishes. The main carp species are *Catla catla* (catla), *Cirrhinus mrigala* (mrigal), *C.cirrhusa* (carnatic carp), *Labeo rohita* (rohu), *L.calbasu* (kalbasu), *Gonoproktopterus curmuca* (kooori, Kural), *G. micropogan* (kariyan).

6.0 Marine recreational fishing

In India, angling in coastal or marine waters have great scope. Coastal belts which facilitate recreational fishing in India, are Odisha, Lakshwadweep, Andaman and Nicobar Islands, Goa and Kerala. The main centers are Mumbai, Kandla, Nhava sheva, Marmagao, Alibang, harihareshshawar, Kankavali, Vijaydurg, Kochi, Kolkatta/Haldia, Paradip, Vishakapatnam, Chennai and Tuticorin. The main species which are encountered in marine angling are tuna species, mackerel, seer species, snapper, giant travelly, grouper, barracuda and marlins. Presently an organized marine recreational fishing is practiced only in Andamans. Circle hooks and barbless hooks are used in the lines to have minimum injury to the fishes caught. Here, the angling activity exclusively is of the 'catch and release' type viz., the catch is released back in to the sea and is not retained unless injured severely.

7.0 Legal framework

In many European countries and US, recreational fishing is regularized in terms of minimum landing size, prohibited species, closed seasons, area and gear specifications. In India, the sector is not sufficiently regulated in all centres. Generally, the Tourism and/Fisheries Departments are giving licenses to fish a specific stretch of river and there are restrictions on the number of fishes that can be caught. For marine angling, the minimum crew requirement is to be followed and it is mandatory for the crew to have identity cards. The permits are issued to tourists for a day to a week with regulations on the number and size of fishes permitted to fish. Fishes below the stipulated size are not allowed to fish. Generally fishing licenses are not issued during monsoon when majority of the fishes breed. Catch and release policy is stipulated in certain sectors.

8.0 Problems of the Sector

Absence of clear cut policies is a major problem facing the recreational fishing sector of India. For any management interventions, data base on the sector viz., number of participants,

employment opportunities, financial benefits, fishing implements used, treatment of the catch etc. are required. This is lacking in the Indian sector. The fresh water angling destinations lack comfortable camping facilities, approach roads and anglers hut. In the marine angling sector, the problems are lack of infrastructure for out board motor servicing, vessel dry-docking and also absence of provision for fresh water and bunkering facilities at the jetty. There is a huge untapped marine resource around Andaman islands. This species has the maximum attraction from foreign clients. However, India is not able to capture this market due to the absence of dedicated fishing boats and experienced crew with good communication skills. The local fishermen who work on sports fishing vessels in Andamans lack language command to deal with foreign clients.

There are instances of recreational fishers having negative impact on commercial fishers. The increased fishing pressure for masher Tor khudree in the Western Ghats led to their decline. Anglers mostly target large individuals, which can have a negative impact on the ecosystem. Removal of larger individuals adversely affects the balance of the food web. The European Inland Fishery Advisory Commission (EIFAC) developed the Code of Practice for Recreational Fisheries in 2007-08, which stipulated standards for responsible environmentally friendly recreational fishing. FAO is developing technical guidelines for censoring all types of recreational fisheries viz., harvest oriented angling, catch and release fishing, trapping and spear fishing in marine, coastal and inland waters. Such guidelines are meant for sustenance of the system ensuring a balanced development of recreational and commercial fishing.

9.0 Conservation aspects

Many recreational fishers is characterized by open-access scenario which is giving intense fishing pressure on certain pockets. Hence, the catch quota system is to be implemented to avoid unhealthy fishing pressure on the resources. Monitoring of the recreational fishers is to be done through registration and licensing.

The conservation measures that can be adopted in recreational fisheries are size limits, imposing licenses and fees, stocking of fish, closed fishing seasons, harvest regulations, 'catch and release' policy, habitat management, human interference and control of predatory or unwanted species. Closed areas, gear restrictions, catch limits, size restrictions on species caught and regulation of fishing effort are other regulatory measures imposed for sustainability of the system. Size limits is one of the common form of management measure, in which the size of the fish that may be harvested and those that must be released are stipulated. Imposing licenses and fees for angling may prevent the number of anglers and intensity of angling. Stocking plays an important role in recreational fisheries management. The practice involves regularly stocking the water with hatchery produced fingerlings. In some areas authorities/regional bodies implement closed season for recreational fishing. Which will protect the stock and recruitment of fish population. Regulating the manner of fishing, safe fishing methods, prevention of fishing by using explosives and poisons, gear restrictions etc are the major harvest regulating methods. Habitat management protects the

habitat of the fish population where the recreational fishing is conducted. It includes protecting, modifying, mitigating and restoring biological and physical factors of the habitat. Human interference such as increasing use of water bodies for irrigation, hydropower production, municipal and industrial purposes and inputs of pollutants have also impacted on fish stocks. Control of predatory species like snakes, frogs, birds etc. in the angling or recreational fishing areas will aid in sustainability of the system. Fishing licenses should not be issued during the breeding season of fishes (mostly monsoon). While issuing licenses the condition of 'catch and release' should be ensured. Use of barbless hooks and circle hooks reduces the chance of deep hooking and severe wounds giving a better chance for the survival of the released fish.

Recreational fisheries, important in most of the developed and developing countries of the world is a growing sector which attract people from all walks of life. For conducting recreational fishing judiciously, government has to implement strict regulations and management plans.

10.0 Further reading

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