# ENVIRONMENTAL SCIENCE ARCHIVES ISSN: 2583-5092 Volume IV Issue 1, 2025



Received: 2025/04/17 Accepted: 2025/05/12 Published: 2025/05/19 REVIEW

# **OPEN ACCESS Recent Trends and Relevance of** Sport Fisheries in Psychosocial **Development of Fisherman in** Northern West Bengal, India

# Mainak Banerjee<sup>1\*</sup> and Arghya Mandal<sup>2</sup>

<sup>1</sup>Department of Zoology, RKDF University, Ranchi, Jharkhand, India <sup>2</sup>SACT, Department of Environmental Studies, Mankar College, Mankar, West Bengal, India, 713144 \*Correspondence for materials should be addressed to MB (email: mainak.bio@gmail.com)

# Abstract

Sport fishing, is a popular leisure activity worldwide, valued for its relaxation, enjoyment, and health benefits. Unlike commercial or subsistence fishing, it is pursued for pleasure rather than profit or food. Historical records from ancient civilizations highlight its long-standing cultural significance. In India, sport fishing has a rich tradition, but there is a notable lack of scientific knowledge and standardized regulations, especially regarding conservation of threatened species. While only a few Indian states enforce government norms, expanding recreational fishing could support ecotourism and generate employment, particularly in rural areas. To ensure sustainable growth, increased government involvement, better regulatory frameworks, and collaboration with local communities are essential. Citizen science and improved fisheries management can help address knowledge gaps and promote the conservation and management of sport fish resources.

Keywords: Sport fishing; Angling; Netting; Socioeconomic status; Fisherman; West Bengal

# Introduction

The term "sport fishing" refers to the pursuit of aquatic creatures, mostly fish, which are not often bought or sold on domestic, international, or hidden markets and do not serve as the individual's major source of food (FAO,2012). Fishing for enjoyment or leisure is referred to as sport fishing. With a 5% global annual growth rate, it is the tourist industry's fastest-growing subsegment. The following methods of fishing are used recreationally: hand collecting, spearfishing, netting, angling, and trapping. One of the most popular types of sport fishing is "angling," or fishing with a rod, line, and hooks. Big Game Fishing, which employs speedboats to target huge open-water species like Tuna, Sharks, and Marlin, is another popular sport fishing technique. Bow-Fishing using a traditional bow or a crossbow is a less popular method. Knowledge of fish habits, habitats, and behaviors such as foraging, migration, etc. is frequently necessary for the efficient use of fishing tactics. The Northern area of West Bengal, which is blessed with natural scenic beauty, is a kaleidoscope of various terrain, race, culture, and rich biodiversity that draws visitors from all over the world. The potential for angling tourism to grow in this area is enormous. Everyone in this region, regardless of age or socioeconomic status, now enjoys fishing as a family activity. Sport fishing is another activity that is thought to support local economic growth in addition to being enjoyable.

# History of sport fisheries



Fishing has a history as long as the planet itself, and the oldest recorded mentions of it stretch back to antiquity. Great Greek thinkers like Aristotle and Plato discussed the activity of angling, while the historian Plutarch provided information about fishing lines. Fishing played a significant role and became ingrained with the religion and culture of the society throughout history, from Greece and Rome to the ancient civilizations of India and Eqypt. In the history of sport fisheries, the early development of fishing as enjoyment is not well understood. It's believed that the Norman invasion of England in 1066 brought the first fly fishing enthusiasts to the country (McCully, 2000). Although it is unclear when fishing was initially considered a leisure activity, it gained prominence after Izaak

Walton's 1653 publication of "The Complete Angler." The book is among the earliest to discuss the benefits of fishing as a sport. When sport fishing first started is disputed historically. A far more recent trend is fishing for enjoyment only and releasing the fish that are caught. The development of big game fishing from sport fishing was made feasible by the introduction of motorized boats. Dr. Charles Fredrick Holder, who wrote many books and papers on the subject in 1989, is mainly credited with the development of big game fishing. In his Indian book "Manasollosa" on recreational fishing, King Somesvara (1127 AD) mentions angling (Matsyavinoda) (Hora, 1951). In the Ganges, Mahseer (*Tor spp.*) were first noted in the early 19th century (Hamilton,1822). Both 1873's Tank Angling in India and 1897's The Rod in India by H. S. Thomas mention fishing. In addition to writing about tigers and leopards in India, Edward James "Jim" Corbett (1875–1955) also covered mahseer in many of his works. A. St. J. Macdonald's Circumventing the Mahseer and Other Sporting Fishes from 1948 and The Angler in India on the Mighty Mahseer by Dhu from 1923 are two books that merit mentioning in this context (Sehgal, 1987). Brown trout and rainbow trout were first introduced by British anglers in the 1860s and 1909, respectively, in streams and rivers of the Himalayas and Western Ghats (Sehgal, 1999a, b).

#### Myth regarding fishing

In all agricultural sub-sectors, India possesses a wealth of traditional knowledge and legendary beliefs. Accounting for traditional knowledge and perceptions prevalent in various farming sectors, particularly when supplemented with modern techniques or advanced scientific information, would increase farmer ownership of augmented knowledge, and build farmers' confidence or capabilities to manage natural and owned resources, while also assisting in the control of knowledge erosion. Although fishing in wild environments with various traditional gears and methods is an age-old traditional profession in many parts of rural India, the needs of fish farming and fisheries management are poorly recognized by most stakeholders in comparison to agriculture, horticulture, forestry, and livestock management. Overall, there was a high level of misunderstanding in the area regarding numerous concepts, advised practices, and inputs for fish farming, as well as fish characteristics and river fishing. A survey of the topic of prevalent superstitions offered rational and scientific justifications for them or against them.

#### Recent developments in sport fishing

The expansion of sport fishing as a sector of the tourism economy, with a 5% annual growth rate globally, is a recent development in sport fishing. Techniques used in sport fishing include netting, trapping, spearfishing, and angling. Sport fishing and angling are abundant in India because to the country's extensive coastline, rivers, lakes, and reservoirs (Sarkar et al., 2023). Depending on the area, October through November and mid-February to mid-May are probably the finest times to go sport fishing in India (Boonpeng et al., 2023). Common sport fishing spots are found in India along major rivers and their tributaries, including the Mahanadi, Yamuna, Cauvery, Ganges, Brahmaputra, and Sutlej. Inland waters are home to popular fish species like Mahseer, Trout, and Carps (Patiyal and Pauline, 2023). While Mahseers are popular in northeastern India, sport trout fishing is well-known in the Himalayan rivers. Popular in India, the Golden Mahseer, popularly called the "Tiger in Water," is a game fish. Hatcheries and conservation associations have been established as part of the efforts to maintain and enhance sport fisheries. Although game fishing is possible off the coast of India, especially in the Andaman & Nicobar Islands, Odisha, Lakshadweep Island, Goa, and Kerala, sea sport fishing is not as developed there (Taylor et al., 2024). These waters are home to a variety of marine game fish, including as tarpon, grouper, tuna, marlin, and barracuda.

The use of expensive gear, such as carbon fibre rods and echo sounding devices, has recently been added to sport fishing, making the sport more daring (Fish, 2024). Although there is a lack of cooperation between the government and recreational fisherman, there are no consistent regulations despite the potential for large economic gains from sport fishing (Potts et al., 2020). The involvement of rural residents in well-known fishing regions is crucial to the sustainability of India's sport fishing sector. Fisheries management and citizen science initiatives can encourage scientific research in sport fishing (Arlinghaus et al., 2020). Pollution, habitat damage, and reckless fishing techniques are the main challenges to sport fishing. It is important to address these problems and encourage ethical and sustainable sport fishing initiatives, Alaskasalmon fishing, Salmon fishing regulations in the U.S and Major League Fishing (MLF) Updates (Sánchez-Jiménez et al., 2021).

#### Physicochemical importance on sport fishing

The physicochemical characteristics of water have a significant impact on sport fishing since they affect fish behaviour, the suitability of habitats, and the overall well-being of aquatic ecosystems. Gaining knowledge of these characteristics enables fishermen to maximize their fishing tactics and promotes the use of environmentally-friendly fishing methods.

The temperature of water has a considerable impact on the metabolism, growth rates, and activity levels of fish. Each fish species has distinct temperature preferences within certain limits (Mandal et al., 2021). Trout flourish in colder waters, but bass have a preference for higher temps. Understanding the thermal preferences of different species enables anglers to optimise their fishing efforts by selecting the most suitable times and locations. Fish rely on dissolved oxygen for the process of breathing. The concentration of oxygen in water can fluctuate depending on factors such as temperature, salinity, and the presence of organic substances (Mandal et al., 2021). Elevated dissolved oxygen (DO) levels often signify a thriving aquatic ecosystem. Fish exhibit greater levels of activity and are more inclined to engage in biting behaviour in aquatic environments that have higher levels of oxygenation. On the other hand, low dissolved oxygen (DO) levels can cause stress to fish and decrease their feeding behavior. The acidity or alkalinity of water has an impact on the ability of chemicals and nutrients to dissolve and their potential for causing harm. Freshwater fish generally exhibit a preference for a pH range between 6.5 and 8.5. Fluctuations in pH levels can have detrimental effects on fish populations, impacting their ability to reproduce successfully and compromising their overall well-being (Mandal et al., 2020). Monitoring the pH levels aids fishermen in comprehending the appropriateness of a fishing location for various species. Salinity plays a vital role in estuary and coastal fishing, as it refers to the salt content in the water where freshwater and saltwater converge.

Various fish species exhibit varying levels of tolerance to salinity. For example, striped bass have a high tolerance for a wide range of salinities, whereas other species may be more susceptible to changes in salinity (Little et al., 2022). Having a comprehension of salinity levels aids in identifying particular species that are well-suited to those conditions. Turbidity refers to the level of cloudiness in water, which can impact the ability of light to penetrate and subsequently affect fish behaviour. Elevated turbidity levels can diminish the visual range for fish, impeding their ability to locate food and potentially rendering them more vulnerable to capture (Lunt et al., 2022). Some fish species exhibit increased activity in murky waters as a result of reduced visibility for predators. The abundance of nutrients such as nitrogen and phosphorus can have an impact on fish populations by influencing the growth of aquatic plants and algae. This, in turn, affects the availability of food for fish. Nevertheless, an overabundance of nutrients can result in eutrophication, which triggers the growth of excessive algae, leading to oxygen depletion and detrimental effects on fish populations (Dubey and Dutta, 2020). Conductivity is a measure of the water's capacity to conduct electrical current, which is influenced by the concentration of dissolved salts and minerals. It offers an indirect measure of water quality and aids in the identification of pollution sources. Fish in various aquatic environments have developed adaptations to specific ranges of electrical conductivity, and substantial alterations can cause stress to fish populations (Menon et al., 2023).

Through comprehending these physicochemical features, anglers can make well-informed choices regarding the location and timing of their fishing activities, so increasing their chances of success while also playing a role in the preservation of aquatic ecosystems. Monitoring these characteristics also facilitates endeavours to uphold robust fish populations and sustainable fishing techniques.

#### Impact on fisherman

Sport fishing has a significant impact on fishermen, encompassing economic, social, psychological, and environmental dimensions.

#### Economic impact

Sport fishing has the potential to serve as a significant source of revenue for both commercial and recreational fishers. The FECOP (Coasta Rica fishing, NGO) supports a range of sectors, including as boat building, sales of fishing tackle and gear, and tourism services such as guided fishing tours and hotels (Zone, 2013). The popularity of sport fishing in certain places has a positive impact on tourism, leading to an economic benefit for local communities. Communities in close proximity to very desirable fishing spots experience economic advantages through expenditures on accommodations, meals, and various leisure pursuits (FECOP).

#### Social Impact

Sport fishing promotes a sense of camaraderie among fishermen, often resulting in the establishment of clubs and involvement in tournaments. These events have the potential to foster robust social connections and cultivate a deep sense of inclusion and affiliation (FECOP). Fishing holds significant importance in numerous regions, serving as an essential component of cultural heritage and customs that have been transmitted across successive generations (Wedgbury, 2022). This contributes to the conservation of indigenous traditions and rituals associated with fishing on the North Coast.

#### Psychological Impact

Sport fishing offers a means of relaxation and respite from the pressures of daily life, contributing to stress relief and improved mental well-being. Fishing has the potential to boost mental health, alleviate anxiety, and increase general well-being due to the serene setting and the activity itself (Fishing North Coast) (Lloret et al., 2023). Effectively capturing fish can enhance self-worth and offer a sense of achievement. The challenge and expertise inherent in fishing contribute to personal gratification (FECOP).

#### Environmental Impact

Numerous anglers have a strong commitment to conservation, actively endorsing initiatives aimed at safeguarding aquatic environments and promoting fishing methods that can be maintained over time (Day et al., 2014). This entails engaging in catch-and-release initiatives and complying with restrictions aimed at preserving fish populations, such as those established by FECOP (Fisheries Conservation and Protection) and WDFW (Washington Department of Fish and Wildlife). Regulatory measures have a significant impact on fishermen, requiring them to adjust their practices in order to protect fish populations and their habitats. These measures may involve implementing size restrictions, enforcing seasonal closures, and imposing limitations on fishing gear (Fluharty, 2000). Although essential for ensuring sustainability, these laws can present difficulties for fishermen who must remain knowledgeable and adhere to them (WDFW).

#### Technological Impact

The evolution of novel fishing technology and equipment has enhanced the efficiency and availability of sport fishing. Technological advancements such as fish finders, GPS systems, and enhanced equipment augment the fishing experience and elevate capture rates (Major League Fishing) (Pauly, 2019). Environmental monitoring is the utilisation of technology by fishermen to track and assess environmental factors, like water temperature and oxygen levels. This enables them to make well-informed decisions on the timing and location of their fishing activities.

Sport fishing has multiple purposes in the lives of fisherman, including generating economic advantages, establishing social ties, offering psychological solace, and promoting environmental conservation. The interaction among these factors emphasises the significance of implementing sustainable methods to guarantee the enduring viability of both the sport and the ecosystems it relies on.

#### Ecological impact of sport fishing

The ecological consequences of fishing encompass concerns such as fish stock availability, excessive fishing, fishery practices, and fishery administration. Additionally, industrial fishing has a detrimental effect on other aspects of the environment, such as unintentional catch of non-target species (bycatch) (Frouz et al., 2022). These concerns are crucial to marine conservation and are tackled in fisheries science programmes. Based on 2019 research by the Food and Agriculture Organisation (FAO), the worldwide output of fish, crustaceans, molluscs, and other aquatic creatures has steadily increased and reached 172.6 million tonnes in 2017 (Canton, 2021). This is a 4.1 percent growth compared to the previous year, 2016. There is an increasing disparity between the availability of fish and the level of demand, partially attributable to the expansion of the global population (Calich, 2014). The primary factors responsible for the deterioration of ocean health and water quality are fishing activities and the pollution resulting from them. Ghost nets, also known as abandoned fishing nets in the ocean, are composed of non-biodegradable materials such as plastic and nylon (Laville, 2019). These nets cause significant damage to wildlife and ecosystems by disrupting their normal functioning. The depletion of fish stocks and the degradation of marine ecosystems can exert a substantial influence on other environmental factors, including the populations of seabirds (Worm et al., 2006). In addition to overfishing, there is a scarcity of seafood due to the excessive quantities of discarded seafood and the contamination of seafood consumed by the population with microplastics (Pusceddu et al., 2014). The primary cause of this issue is

predominantly attributed to fishing equipment constructed from plastic, such as drift nets and longlining gear, which deteriorate over time due to usage, loss, or disposal.

In November 2006, the scientific journal Science released a study that spanned four years. The study made a prediction that, based on current patterns, the global supply of seafood obtained from natural sources would be depleted by the year 2048 (Steenson and Creedon, 2022). According to the scientists, the decrease in fisheries population is attributed to overfishing, pollution, and other environmental issues that are simultaneously causing the destruction of their habitats (Islam et al., 2004). Several nations, including Tonga, the United States, Australia, and the Bahamas, along with international governing bodies, have implemented measures to effectively oversee marine resources (Zitoun et al., 2020). Reefs are also being decimated by overfishing due to the utilisation of large nets that are dragged across the ocean floor during trawling. Numerous coral reefs are being devastated, resulting in the endangerment of the biological niche of several species (Riegl et al., 2009). Certain fishing methods result in the degradation of habitats. The practices of blast fishing and cyanide fishing, which are prohibited in numerous locations, inflict damage to the surrounding ecosystems.

Blast fishing is the act of employing explosives to harvest fish. Cyanide fishing is the act of utilising cyanide to immobilise fish in order to gather them. These two tactics are frequently employed in the aquarium trade and the live fish food trade (Jawad, 2021). These activities are detrimental as they affect the habitat of reef fish once they have been removed. Bottom trawling, which involves dragging a fishing net down the ocean floor behind trawlers, results in the removal of approximately 5 to 25% of the marine life inhabiting the seabed in a single operation. This fishing technique often results in a significant amount of bycatch (Daskalov et al., 2007). In October 2006, US President George W. Bush, along with other global leaders, advocated for a halt on deep-sea trawling (Deep water, 2011). The empirical evidence has consistently demonstrated that the practice frequently has detrimental impacts on marine ecosystems and consequently, on the abundance of fish. Moreover, ghost fishing poses a significant menace to catch fisheries. Ghost fishing is the phenomenon where a net, such as a gill net or trawl, is unintentionally abandoned or lost at sea and continues to float in the water, trapping marine animals (Been, 2015). In accordance with the FAO Code of Conduct for Responsible Fisheries, it is imperative for States to take measures to reduce the quantity of lost and abandoned fishing equipment and actively strive to minimize the occurrence of ghost fishing (Coll et al., 2013).



Fig. 1. Greenhouse gas emission per kilogram of sea food (Gephart et al., 2021)

Overfishing can lead to the excessive utilisation of marine ecosystem services. Fishing can induce several adverse physiological and psychological consequences for fish populations, such as heightened stress levels and physical harm caused by embedded fish hooks (Cooke and Sneddon, 2007). Frequently, when this boundary is surpassed, hysteresis may manifest within the surroundings. Specifically, the Black Sea marine ecosystem has seen ecological disruptions due to a mix of overfishing and other human activities. These activities have had a negative impact on the marine environment and ecosystem. Ecological disturbance can also arise from the over harvesting of crucial fish species like tilefish and grouper, which are known as ecosystem-engineers. Fishing

can disturb food webs by selectively targeting particular species that are highly sought for. Excessive fishing of prey species, such as sardines and anchovies, may lead to a decrease in the food available for predators (Van Beveren et al., 2017). Interfering with these species that have a narrow waist like wasps can have far-reaching consequences for the entire ecosystem. Additionally, when the targeted fish species are predators like salmon and tuna, it can lead to an increase in the population of their prey species. The carbon storage capacity of the oceans is also impacted by overfishing and pollution, hence exacerbating the climate catastrophe (Bijma et al., 2013). Bottom-trawling fishing poses a threat to the release of carbon contained in seafloor sediments.

#### Conclusion

The practice of sport fishing in Northern West Bengal has had a substantial influence on the mental development of fishermen. The increasing prevalence of sport fishing has created economic prospects for anglers, enabling them and enhancing their standard of living. Additionally, it facilitates social cohesion by bringing together individuals from diverse backgrounds via various clubs and organisations, thereby cultivating a feeling of community and inclusion. Engaging in sport fishing has been demonstrated to enhance mental well-being by promoting relaxation and fostering a feeling of achievement. Additionally, it plays a role in preserving and promoting the local cultural history, cultivating a feeling of pride and identity among the indigenous fishermen. In addition, sport fishing enhances fishermen's environmental consciousness and dedication to conservation, resulting in the adoption of more ecologically sustainable fishing techniques and enhanced management of natural resources. The sustainable development and supportive regulations are crucial factors for the growth and success of sport fishing in Northern West Bengal.

#### References

Arghya M, Subhas D, Atanu P, Sekhar MN and Ratan GA (2021) Evaluation of oxidative stress enzymes of spawn and fry of Clarias batrachus (Linn. 1758) exposed to artificial UV-B radiation: A biomarker analysis. Intern. J. Zool. Invest, 7(2): 308–323.

Arlinghaus R, Aas Ø, Alós J, Arismendi I, Bower S, Carle S, et al. (2021) Global participation in and public attitudes toward recreational fishing: international perspectives and developments. Reviews in Fisheries Science & Aquaculture, 29(1): 58–95.

Been H (2015) Removal of derelict fishing gear, lost or discarded by fishermen in the Baltic Sea.

Bijma J, Pörtner HO, Yesson C and Rogers AD (2013) Climate change and the oceans–What does the future hold? Marine Pollution Bulletin, 74(2): 495–505.

Boonpeng C, Sangiamdee D, Noikrad S and Boonpragob K (2023) Lichen biomonitoring of seasonal outdoor air quality at schools in an industrial city in Thailand. Environmental Science and Pollution Research, 30(21): 59909–59924.

Calich H (2014) Global population growth, wild fish stocks, and the future of aquaculture.

Canton H (2021) Food and agriculture organization of the United Nations-FAO. In: The Europa directory of international organizations 2021. Routledge, pp. 297–305.

Coll M, Libralato S, Pitcher TJ, Solidoro C and Tudela S (2013) Sustainability implications of honouring the Code of Conduct for Responsible Fisheries. Global Environmental Change, 23(1): 157–166.

Cooke SJ and Sneddon LU (2007) Animal welfare perspectives on recreational angling. Applied Animal Behaviour Science, 104(3–4): 176–198.

Daskalov GM, Grishin AN, Rodionov S and Mihneva V (2007) Trophic cascades triggered by overfishing reveal possible mechanisms of ecosystem regime shifts. Proceedings of the National Academy of Sciences, 104(25): 10518–10523.

Day A, Laffoley D, Davis J, Jeffrey A, Musard O and Vick C (2014) Innovation in communications about marine protection. Aquatic Conservation: Marine and Freshwater Ecosystems, 24(S2): 216–237.

Dubey D and Dutta V (2020) Nutrient enrichment in lake ecosystem and its effects on algae and macrophytes. In: Environmental concerns and sustainable development: Volume 2: Biodiversity, soil and waste management, pp. 81–126.

Fish A (2024) Oceaning: Governing Marine Life with Drones. Duke University Press.

Fluharty D (2000) Habitat protection, ecological issues, and implementation of the Sustainable Fisheries Act. Ecological Applications, 10(2): 325–337.

Frouz J, Frouzová J, Frouz J and Frouzová J (2022) General Background in Ecology and Environmental Sciences. In: Applied Ecology: How agriculture, forestry and fisheries shape our planet, pp. 1–79.

Islam MS and Tanaka M (2004) Impacts of pollution on coastal and marine ecosystems including coastal and marine fisheries and approach for management: a review and synthesis. Marine Pollution Bulletin, 48(7–8): 624–649.

Jawad LA (2021) The Impact of Destructive Fishing Gear on the Fish Biodiversity in the Inland Waters of Iraq. In: Tigris and Euphrates Rivers: Their Environment from Headwaters to Mouth, pp. 1207–1224.

Laville S (2019) Dumped fishing gear is biggest plastic polluter in ocean, finds report. The Guardian, 6.

Little SA, Lewis JP, Pietkiewicz HE and Mazik KR (2022) Estuarine tidal freshwater zones in a changing climate: Meeting the challenge of saline incursion and estuarine squeeze. In: Challenges in estuarine and coastal science: Estuarine and coastal sciences association 50th anniversary volume, pp. 94–112.

Lloret J, Gómez S, Rocher M, Carreño A, San J and Inglés E (2023) The potential benefits of water sports for health and well-being in marine protected areas: A case study in the Mediterranean. Annals of Leisure Research, 26(4): 601–627.

Lunt WM, Burt de Perera T and Newport C (2022) The influence of visual pollution on navigation mechanisms in the damselfish (Chrysiptera cyanea). bioRxiv, 2022-10.

Mandal A, Biswas T, Mondal NS, Dey S, Patra A, Das S, et al. (2021) Assessment of the nutritional quality of fish cultured in Samdihi, an open cast coalpit at the Raniganj Coal Field areas, West Bengal, India. Lakes & Reservoirs: Research & Management, 26(1): 3–12.

Mandal A, Mondal NS, Patra A, Das S, Dey S, Mondal AK and Ghosh AR (2020) Time dependent ultrastructural alterations on the skin, eye, barbel and fins of the spawn of Clarias batrachus (Linn. 1758) exposed to UV-B radiation. Ecotoxicology and Environmental Safety, 192: 110268.

Menon SV, Kumar A, Middha SK, Paital B, Mathur S, Johnson R, et al. (2023) Water physicochemical factors and oxidative stress physiology in fish, a review. Frontiers in Environmental Science, 11: 1240813.

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Dril (Eds.) (2011) Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling: Report to the President, January 2011: The Gulf Oil Disaster and the Future of Offshore Drilling. Government Printing Office.

Patiyal RS and Pauline A (2023) Livelihood opportunities with recreational fisheries and ecotourism. In: Fisheries and aquaculture of the temperate Himalayas, Singapore: Springer Nature Singapore, pp. 433–440.

Pauly D (2019) Vanishing fish: shifting baselines and the future of global fisheries. Vancouver: Greystone Books Ltd.

Potts WM, Downey-Breedt N, Obregon P, Hyder K, Bealey R and Sauer WH (2020) What constitutes effective governance of recreational fisheries?-A global review. Fish and Fisheries, 21(1): 91–103.

Pusceddu A, Bianchelli S, Martín J, Puig P, Palanques A, Masqué P and Danovaro R (2014) Chronic and intensive bottom trawling impairs deep-sea biodiversity and ecosystem functioning. Proceedings of the National Academy of Sciences of the United States of America, 111(24): 8861– 8866.

Riegl B, Bruckner A, Coles SL, Renaud P and Dodge RE (2009) Coral reefs: threats and conservation in an era of global change. Annals of the New York Academy of Sciences, 1162(1): 136–186.

Sánchez-Jiménez A, MacMillan D, Wolff M, Schlüter A and Fujitani M (2021) The importance of values in predicting and encouraging environmental behavior: reflections from a Costa Rican small-scale fishery. Frontiers in Marine Science, 8: 543075.

Sarkar A, Rana S, Bhowmik P, Hasan N, Shimul SA and Al Nahid SA (2023) A review of suckermouth armoured catfish (Siluriformes: Loricariidae) invasion, impacts and management: is its invasion a threat to Bangladesh's fisheries sector? Asian Fisheries Science, 36(3).

Steenson S and Creedon A (2022) Plenty more fish in the sea?—is there a place for seafood within a healthier and more sustainable diet? Nutrition Bulletin, 47(2): 261–273.

Taylor AT, Bellapigna ZL and Pohlot BG (2024) Updating angling records to advance sport fish conservation: a case study of IGFA's black bass world records. Fisheries.

Van Beveren E, Fromentin JM, Bonhommeau S, Nieblas AE, Metral L, Brisset B, et al. (2017) Predator–prey interactions in the face of management regulations: changes in Mediterranean small pelagic species are not due to increased tuna predation. Canadian Journal of Fisheries and Aquatic Sciences, 74(9): 1422–1430.

Wedgbury A (2022) Fishing for likes: towards an understanding of the social media culture of anglers. Doctoral dissertation, University of Worcester.

Worm B, Barbier EB, Beaumont N, Duffy JE, Folke C, Halpern BS, et al. (2006) Impacts of biodiversity loss on ocean ecosystem services. Science, 314(5800): 787–790.

Zitoun R, Sander SG, Masque P, Perez Pijuan S and Swarzenski PW (2020) Review of the scientific and institutional capacity of small island developing states in support of a bottom-up approach to achieve sustainable development goal 14 targets. Oceans, 1(3): 109–132.

Zone CRSEE (2013) Tuna catches and fisheries management in Costa Rica's exclusive economic zone.

#### **Author Contributions**

MB and AM conceived the concept, wrote and approved the manuscript.

Acknowledgements Not applicable.

**Funding** Not applicable.

**Availability of data and materials** Not applicable.

**Competing interest** The authors declare no competing interests.

**Ethics approval** Not applicable.



**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution, and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons license unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain directly permission from the copyright holder. Visit for details more http://creativecommons.org/licenses/by/4.o/.

**Citation**: Banerjee M and Mandal A (2025) Recent Trends and Relevance of Sport Fisheries in Psychosocial Development of Fisherman in Northern West Bengal, India. Environmental Science Archives 4(1): 289-296.

