



A CRITICAL LEGAL STUDY TO ASSESS THE THREAT OF ORNAMENTAL INVASIVE FISHES TO THE NATIVE AQUATIC DIVERSITY IN INDIA

Gyanashree Dutta*

Alliance School of Law, Alliance University, Central Campus, Chikkahadage Cross,
Karnataka 562106, Bangalore, India.

Corresponding Author Email: duttagyanashree123@gmail.com

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ABSTRACT

Today, invasive species management in aquatic habitats is a global concern. Aquarium keeping and ornamental fish breeding have become a growing sector all over the world. Most of these ornamental fishes are invasive alien species, which is considered today as the second most threat to the world next to habitat loss. Organisms or species that are non-native to a habitat and which can threaten the native environment or human health are known as invasive alien species. This has become more active in the development of exotic ornamentals in India, as customers are very much interested in rearing varieties of new fish species. A country like India, which is well-known for its vast aquatic resources, especially for its freshwater fisheries, the continuous ornamental fish trade and the release of alien or foreign fishes into the marine environment represents a major danger to India's native aquatic biodiversity. Most of these ornamental fishes are imported to India from other countries. The majority of exotic ornamental fishes are also bred in India, where the demands for such fishes are easily met by a sufficient supply to those people who pursue their hobby in breeding such exotic ornamental fishes. The general public, researchers and especially the policymakers should be aware of the implications of such ornamental fishes in the freshwater habitats like the wetlands of India. The aquarium fish trade and the accidental discharge of alien species into these freshwater habitats should be strictly monitored and controlled. Otherwise, ornamental fish invasions will destroy the entire aquatic native biodiversity. To date, India lacks a strict comprehensive law in protecting its marine environment from the exotic ornamental fishes. Thus, the research will highlight on why it is the need of the hour to have a sui-generis law in India for the purpose of conserving and protecting its marine biodiversity at large.

KEYWORDS: India, Exotic, Ornamental fish, Aquatic, Invasive Alien Species, Biodiversity.

INTRODUCTION

“We can change the world and make it a better place. It is in your hands to make a difference” – By Nelson Mandela

Displacement of native species, alteration of hydrological cycles affecting nutrient cycles and changing food web dynamics, introduction of new diseases and parasites, and hybridization with native species are all major ecological and economic threats to rivers, lakes, and waterways around the world. Infact, today, after habitat loss, invasive alien species has been considered as the second most threat to the world. Aquarium keepers have long been attracted by ornamental fishes because of their vibrant colours and physical features. The various shapes and unique beauty of some fishes have captivated mankind since the ancient period, giving them the nickname of “ornamental fish.” These fishes are often attractive colourful fishes with a variety of traits that are maintained as pets in a confined location such as an aquarium or a garden pool for the purpose of entertainment. The Guidelines for Import of Ornamental Fishes into India, published in November 2015, under the National Fisheries Development Board defines “ornamental fish” as, “fish, invertebrates such as corals, crustaceans (e.g., crabs, shrimps, hermit crabs), mollusks (e.g., snails, scallops, clams)”.

As because India is blessed with a high biodiversity of freshwater ornamental fishes, vast freshwater resources, and suitable agro-climatic conditions for captive breeding of many native ornamental fishes throughout the year, the ornamental fish business is regarded as a sleeping giant in India. Most of these ornamental fishes are invasive aquatic species, which destroys the native marine biodiversity at large. However, it should be highlighted that India’s current ornamental fish exports are mostly based on a few indigenous wildlife, that only serve a small percentage of the worldwide market. Today, the growing practice of wild collection for export, which is vulnerable to exploitation, is a major source of worry. The domestic ornamental trade in India is mostly focused on exotic fish, the majority of which have been domesticated in India

for a long time. Non-native fishes are imported all over the world to improve aquaculture, aquarium keeping, sport, and for control of mosquitoes. For at least a century, live fishes have been transported throughout the world for the aquarium and aquaculture businesses. However, the new focus on trading of fishes as a significant source of long-term livelihood is a major issue that concerns today. In India, many ornamental fishes are found in rivers, lakes, traditional village ponds, and other inland freshwater bodies, ranging from the small guppy to the ferocious red piranha. In our inland wetlands, a number of alien ornamental organisms have already multiplied. Their numbers are growing as inexperienced local sellers breed more than 200 foreign aquarium fish species in various regions of India. Small cement reservoirs or earthen ponds, plastic-lined pools, farmhouse ponds, and granite quarries also serve as breeding habitats for the exotic fishes. As because most of these habitats are not properly secured or enclosed, alien fish can easily penetrate adjacent natural habitats during monsoon floods, posing a danger to the local biodiversity. Alien fish typically disrupt aquatic ecosystems by altering water quality and causing the loss of native fishes through predation (eggs, adults, larvae, etc.), damage to aquatic habitat, food resource exploitation, and pollution of natural gene pools. The extinction of local fish species can have a significant impact on rural and livelihoods of indigenous population, health, and overall well-being. As a result, it is essential to keep track of the migration of ornamental fish, and its introduction in the wild, particularly in India’s natural and constructed wetlands and inlands, and to maintain our natural biodiversity.

Environmentalists, ecologists, conservationists, and policymakers have not yet examined the aquarium trade as extensively as they have the trading in terrestrial threatened species. Discarding unwanted fishes, escape from

tanks, maybe during storms, and unregulated drainage water carrying live organisms from public aquariums, are all possible causes of exotic species which escape from captivity to the wild. In this regard, if overlooked, introduced aquarium fishes constitute a substantial cause of ecological devastation that might be seriously alarming. The distribution of ornamental trade is complicated since the manner of operation differs between States and nations. The many actors involved in the business like, breeder, collector, retailer, exporter, importer, wholesaler, hobbyists, etc. must be associated with government organisations for its control and regulation. These strategies can benefit in the long-term regulation of ornamental trade and commerce in India.

The pathways of introduction of such exotic fishes into the aquatic habitats depends on a large number of political, cultural, socio-economic, as well as economic factors of a particular region. Human movement has unavoidably served as a source of species introduction for a long time. Demand for food resources, on the other hand, promotes the introduction of commercially important exotic aquaculture fish species. Over time, some of these introduced fish species escaped into the wild and developed into invasive species. Some other significant pathways of such introduced species includes unscientific aquaculture practice, ornamental trade, sport fishing, natural disaster, mosquito control, and ballast water in ships. Thus, these introductions may be intentional or unintentional. In India, the incidences and impacts of invasive ornamental fish species are very poorly addressed. Thus, in order to safeguard its maritime environment against alien invasive ornamental fishes, India lacks a strict sui-generis comprehensive law till date.

HISTORY OF INTRODUCTION OF INVASIVE ALIEN FISHES IN INDIA

The introduction of any desired species appears justified in low-diversity nations, but unrestricted introduction in a country like India, which has a rich biotic diversity, is very questionable. Despite India's abundant fish diversity, a significant number of alien fish species have been knowingly or unknowingly introduced to meet the needs of expansion of species for aquaculture, stocking in reservoirs and lakes, for sport-related activities, development of varieties in aquarium trade, as well as for larval control in the lakes, ponds and reservoirs. The introduction of foreign fish species began in India in 1863, when Sir Francis Day attempted unsuccessfully to transport brown trout eggs to the Nilgiri hills. Later, in 1900, Mr. F.J. Mitchel successfully brought brown trout eggs from Scotland to Harwan in Jammu and Kashmir. Following independence, a variety of food and decorative fishes, including carps, were introduced into India.

The International Union for Conservation of Nature defines an Invasive Alien Species as, "a species that gets established in natural or semi-natural environment or ecosystem and can be an agent of change that affects the biological diversity". Over 300 foreign or alien fish species have been observed in India, including 291 ornamental species, 31 aquaculture species, and three larvicidal fishes. The ornamental fish trade India is controlled by the existence of more than 400 exotic fish species, including Goldfish, Guppy fish, Angelfish, Oscar fish, Swordtail, Sucker mouths, Pacu fish, Platy fish, Red Piranha, etc. and these ornamental and exotic fishes have been bought to India from various places of the globe. It is noteworthy here that, most of these fishes acquire a king's share in the aquarium businesses in India. The mosquito fish, a native of North America and parts of Mexico, has been introduced today in many rivers, lakes and

aquariums in India. As a mosquito-control agent, it has been used all over the world and has become a nuisance in a number of rivers. It also preys on rare indigenous fishes and invertebrate species, as well as the eggs of commercially significant fishes. Guppy fish, which is generally used for controlling mosquitoes, is a native to Caribbean and North-South America, which are becoming more commonly farmed and distributed in India mainly for the aquarium trade and business. Through the breeding of these fishes, aquaculture and fisheries are negatively impacted by reducing the native biodiversity, and also leads to threat or loss of endangered species at large. Southern platyfish, a native to North and Central America, is a tiny, popular freshwater ornamental fish that lives in the aquatic habitats as an introduced species. It is a potential food competitor for indigenous fishes like Melon Barb, Ticto Barb, Striped Panchax, Blue Panchax, Ceylon Killifish, etc., due to its hunting habit. Because of its extensive environmental tolerances, capacity to colonise damaged environments, rapid growth rates, the southern platyfish is considered to be invasive in nature. In 1952, the Mozambique tilapia was initially introduced into various pond habitats, and it was thereafter supplied in numerous lakes of South India. Suckermouth catfish, which is a native to Central and South America, has been identified as a major danger to freshwater biodiversity across the world. It changes the physico-chemical constitution of water and affects the entire marine ecosystem. It also has severe consequences for periphyton-feeding and bottom-spawning fish. Furthermore, it swallows the eggs of native species, resulting in the extinction of indigenous species in the area. Today, suckermouth catfishes are kept in most of the aquariums in India as it consumes waste food from the bottom of the aquarium tank and also clears the algae from the surfaces of the tanks.

THE INTERNATIONAL RESPONSE

The National Biodiversity Authority (NBA) addresses the negative effects of invasive species on Indian inland aquatic ecosystems like lakes, ponds, and rivers. The Convention on Biological Diversity, 1992 provides that, "Each contracting Party shall, as far as possible and as appropriate, avoid the introduction of, control or eliminate those alien species which threaten ecosystems, environments or species". The goal of Aichi Target 9 of the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011-2020 is to detect, prioritise, and control invasive alien species and their invasive paths. India is required to act on this aim as a member to the Convention, nevertheless, controlling invasive species in freshwater ecosystems while balancing public views and economic imperatives is a great challenge. Again, the International Union for the Conservation of Nature, 2000, defines "Invasive Alien Species" as, "Invasive species (also known as pests, weeds, and illnesses) are plants, animals, disease agents, and other creatures that have been purposefully or unintentionally introduced outside of their natural range by humans and have proven harmful to the environment or human interests." Since the United Nations Convention on the Law of the Sea (UNCLOS) coming into effect in 1994, the problem of illegal fishing has drawn much attention. Several other international instruments like the Food and Agriculture Organisation Compliance Agreement of 1993, Food and Agriculture Organisation's International Plan of Action of 1999, the U.N. Fish Stocks Agreement, 1995, and more recently, the Food and Agriculture Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal Unreported and Unregulated Fishing, 2009, strictly emphasises towards the need to regulate the various activities of fishing vessels both within and outside the Exclusive Economic Zone (EEZ).

The Salmon and Freshwater Fisheries Act of 1975 in England explicitly specifies that it is prohibited to move native and non-native fish within the political borders without following the required procedures. Again, in the United Kingdom, such release of exotic invasive species is prohibited under the Wildlife and Countryside Act 1981. The Animal Welfare Act of 2006, in the United Kingdom protects the welfare of ornamental fishes in both domestic and commercial aquaria. The Ornamental Aquatic Trade Association (OATA) was set-up in 1991 in the United Kingdom, and its main goal is to safeguard and promote the interests of everyone involved in the ornamental aquatic industry. It improves the reputation of the trade by promoting the benefits it provides, establishing high standards, offering excellent education and training, and encourages responsible ownership and satisfaction among fish keepers.

LEGAL RESPONSE IN INDIA

The Guidelines for Import of Ornamental Fishes into India which was published in November 2015, defines 'quarantine' as to the isolation of a group of aquatic species with no direct or indirect interaction with other aquatic animals for a specific period of time and, if necessary, testing and treatment, including correct treatment of waste water is important. The Guidelines also throws light to the concept of "susceptible species", which means a kind of aquatic organism in which infection has been proven by natural instances, or artificial exposures to the disease agent that replicates the pathways for natural infection. Also, under the Guidelines, the words "pre requisites" provides that, no ornamental fish species may be imported if they are determined to fall into any, or all of the following groups:

1. A hazardous aquatic species which has been detected and possesses the capability of harming and injuring humans and animals.

2. An aquatic species which can injure humans by possessing poisonous spines, toxins, flesh, etc.
3. An aquatic species which is known as a carrier or vector of pathogens.
4. Species classified under the Convention on International Trade in Endangered Species (CITES), the International Union for Conservation of Nature's (IUCN) threatened list, or under the threatened list of the exporting country.
5. Species subject to any other import prohibition established by national legislation or any international conventions or treaties.
6. Invasive species with well-documented negative consequences in India or other countries with similar environmental situations to India.

Furthermore, before alien aquatic species are imported into India, the National Committee on Introduction of Aquatic Species has the authority to evaluate them. Also, the Ministry of Agriculture, Government of India, has established rules for the import of ornamental fishes, which emphasise the significance of obtaining a pre-quarantine certificate from the competent body of the exporting country. Moreover, the recommendations also emphasises the importance of post-quarantine monitoring.

Also, India has a plethora of laws like the Environmental Protection Act of 1986, the Biodiversity Act of 2002, the Water (Prevention and Control of Pollution) Act of 1974, the Merchant Shipping Act, 1958, etc. but none of these legislations focuses directly with the problem of the introduction of ornamental invasive species and its harmful impacts in the marine ecosystem of India.

CONCLUSION

From all the above discussions, it can be concluded by saying that exotic species introductions that are unregulated or illegal,

as well as the management or removal of such exotic invasive species, are concerns that must be addressed nationally, internationally, as well as locally. Invasive ornamental fish today represents a major danger to India's aquatic habitat when released into the wild. However, no rigorous and in-depth study has been conducted in India to quantify the economic and ecological losses caused by ornamental fish invasion in inland lakes, especially in the wetlands of India. Several developed countries, like the United States and the United Kingdom, have made significant contributions to studies on biological invasions of ornamental fishes in the wild. India should take note of their experiences in this respect and enhance regulatory restrictions on the trade in ornamental fish and the release of wild fish. In India, however, sellers and hobbyists often break the laws and introduce a variety of beautiful fish species, and by doing this, in the future, India is extremely vulnerable to further invasions of ornamental fishes, their diseases, and other pathogens. Our water bodies will soon become breeding grounds for exotic decorative or ornamental fishes, which could eventually drive out India's native, indigenous freshwater fishes, unless strict steps are implemented to oversee the aquarium fish trade and unintentional discharge of exotic species into inland waters like the wetlands. Under the Ministry of Environment, Forests and Climate Change, a regulatory authority to deal with concerns related to invasive alien species is required. It is also necessary to establish a national institute with distinct branches for the management of such harmful species. Such an institute should focus on traders and other stakeholders adhering to the norms, raising awareness among the public and policymakers, and supporting management research. There must also be high-quality training accessible, so that retail employees can convey accurate advice on a particular species. Retail employees should be benefitted from more knowledge about

the source and origin of the ornamental fish which they sell. The Convention on Biological Diversity, 1992, as well as the International Union for Conservation of Nature, 2000, must define "ornamental fish and its impacts in the aquatic biodiversity" in a uniform and stricter manner. Also, heavy penalties must be imposed to any person, who, without the proper approval of the appropriate authority, either imports or exports such exotic ornamental fishes. The exotic ornamental fishes, have to a great extent deteriorated the aquatic ecosystem of India and thus, it is the need of the hour that India should have a sui-generis comprehensive law for the purpose of conserving and protecting its marine biodiversity at large.

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