

# The Status of Alien Invasive Species in Bangladesh and their Impact on the Ecosystems

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## INTRODUCTION

An alien invasive species that colonises the natural or semi-natural ecosystems, is also an agent of change, and threatens native biological diversity. Unfortunately, no consideration was made of the likely adverse effects of introduction of any alien invasive species in Bangladesh.

As a sub-tropical country, Bangladesh is exceptionally rich in biodiversity. Geographically, the country is located at the transition of Indo-Gangetic and Indo-Malayan sub-regions between the Himalayas and the Bay of Bengal. We have almost all the major types of flora and fauna with the characteristics of high growth rate, high economic value, high market demand, etc. Hence, it would be more prudent if the concerned authorities could try to improve and popularise these indigenous species instead of indiscriminately introducing alien invasive species. However, due to not-well-thought-out government policies, weak enforcement of existing safeguards, and lack of popular awareness alien invasive species are taking over natural habitats and rapidly changing the native character of the ecosystem.

## BACKGROUND

Introduction of alien invasive species of flora and fauna were deliberate in Bangladesh, primarily, in order to increase productivity to support the needs of 130 million people in an area of only 147,000 sq. km. However, some of them were introduced for decorative or ornamental purposes. Almost all of the alien invasive species in Bangladesh possess the characteristic of high growth rate, i.e. high turnover rate.

Introduction of alien species has a long history in Bangladesh. Perhaps the first widely introduced alien species in Bangladesh is Water Hyacinth (*Eichhornia crassipes*) which was brought from Brazil during the British period. British ladies were fond of its flowers and brought it over for decorative purposes. At that time, nobody realised how vigorously this species could turn into an aquatic weed. Now it has invaded almost all the wetlands of Bangladesh (Ameen, 1990).

Enforcement of existing safeguard mechanisms, such as proper quarantine measures while importing any exotic species into the country is weak. As a result exotic species were introduced into the country without any proper documentation. Without proper impact assessment in place, the Government had encouraged the introduction of species with high growth rate to increase food productivity to meet the needs of the ever-increasing population.

## PRESENT SCENARIO

Introduction of *Acacia* and *Eucalyptus* into Bangladesh Created several controversies and problems. These were introduced during 1980s from Australia. All the species of these two genera are proven to be rivals to the endemic flora and found to be environmentally unfriendly to Bangladesh (Ameen, 1999). On the other hand, a total of 15 alien invasive species of fish were introduced in Bangladesh; mostly carps. The most ‘disastrous’ alien invasive fishes are *Clarias gariepinus* (African magur), *Pangasius sutchi* (Pangas), *Pangasius giganticus* (Giant Pangas), *Tilapia mossambica* (Tilapia) and *Oreochromis niloticus* (Nilotica). These were brought in from Thailand between 1953 and 1990 (Rahman, 1997). The predatory habit of the first three species is well known. Although, others are not predatory, their fecundity and growth rate are extremely high and they are able to breed naturally.

*Acacia* and *Eucalyptus* trees produce leaves that are not easily degradable. So the soil becomes less fertile and the existence of thousands of humus-dependent species including herbs and earthworms become threatened. These trees absorb large amount of water and hence even the indigenous trees cannot properly grow around it. These trees do not support any wildlife since these do not produce edible fruit or nectar for them. Moreover, the pollen produced by the flowers of these trees harm the respiratory tracts of human beings and lead to allergic diseases (Ameen, 1999).

Currently, a complete list of alien species of plants introduced to Bangladesh is not available. However, an abridged list of alien invasive species of plants introduced to Bangladesh is given in Table 1.

As a country of wetlands, Bangladesh is very rich in fish diversity where 266 species of inland fishes and 442 species of marine fishes are found (IUCN Bangladesh, 2000). Even then, many alien invasive species were indiscriminately introduced and they rapidly spread into the wetlands becoming “biological explosives.” Spread is easy due to recurring flooding. Among the introduced alien invasive species of fishes, *Clarias gariepinus* and *Pangasius* spp. are voracious eaters. In

captive cultures, the cultivators raise these species with a wide array of feeds, viz. indigenous fish, flesh of snails, domestic ducklings, birds, etc. The cultivators also collect carcasses to feed these species. In a chain-reaction, now the vulture population of the country is threatened because all the carcasses are collected and supplied to these fishes (Rahman, 1997). On the other hand, *Tilapia mossambica* and *Oreochromis niloticus* are competing with the small indigenous fishes and gradually occupying their niche habitats. In the case of carps, some interesting data have been collected. The major carps contributed 67 % of the total stock in 1967 in Sylhet-Mymensingh *haor* (huge marshland) basin that rapidly declined to 50 % in 1973 and only 4 % in 1984 (Tsai & Ali, 1987). However, some of these alien invasive species of fish were prescribed only for restricted cultivation in closed ponds; but this strategy was proven to be unsuccessful due to repeated flooding. All these not-so-well thought out actions have contributed heavily to the fate of 54 indigenous species of fish to become threatened (IUCN Bangladesh, 2000). Many of them will become extinct if the process continues.

A condensed list of alien invasive species of fishes brought into Bangladesh is presented in Table 2.

## CONCLUSIONS

It is quite unfortunate that the long-term, and even short-term, adverse effects were not considered while introducing these alien invasive species to Bangladesh. The excessive fecundity and growth rate of these species created pressure on the carrying capacity of the habitat.

All over the world, the alien invasive species have been identified as an agent of the loss of native biodiversity. According to Ameen (1999), alteration of ecological communities caused by alien invasive plant and animal species influence the functioning and overall health of the affected ecosystems. Negative effects of biological invasion include fall in production (e.g., fishery) and added cost of controlling invasives. The overall guiding principles for the prevention, introduction and mitigation of impacts of alien species developed by IUCN are based on the following:

1. Precautionary approach as the pervading principle
2. Sharing of relevant information
3. Research and management of invasives

Combating alien invasive species in Bangladesh will be very difficult because of lack of awareness and proper initiatives. No species should be introduced without adequately evaluating their detailed life history, probable impacts and probable benefits in Bangladesh. Any further introduction of such species must be stopped. People should be made aware of the negative consequences of introducing alien species and the true values of sustaining and reviving, if necessary, the indigenous species. People should be motivated to cultivate indigenous species.

Apart from providing ecological balance the adverse impacts on native biodiversity can be reduced if introduction and spread of alien species is stopped. It is high time that Bangladesh develops suitable methods and policies to deal with invasive alien species.

**Table 1.**

**An Abridged List of Alien Invasive Species of Plants Introduced in Bangladesh  
(Source: Zabala, 1990)**

<b>Name of Species</b>	<b>Common Name</b>	<b>Natural Habitat</b>
<i>Acacia auriculaeformis</i> Cunn. Ex Benth	Akashmoni	Papua New Guinea, Australia, Torres Strait Island
<i>Acacia mangium</i> Willd	Mangium	Australia, New Guinea, Indonesia
<i>Albizia falcataria (L)</i> Fosberg	Malacana	Papua New Guinea, Solomon Island, the Moluccas
<i>Dalbergia sissoo</i> Roxb	Sissoo	Indian Subcontinent
<i>Eucalyptus brassiana.</i> S.T. Blake	Eucalyptus	Papua New Guinea, Australia
<i>Eucalyptus camaldulensis</i> Dehnh	Eucalyptus	Throughout the Mediterranean
<i>Eucalyptus tereticornis</i> Sor	Eucalyptus	Australia
<i>Leucaena leucocephala</i> Lamb. de wit	Telekadam	Mexico, Northern Central America
<i>Pinus caribaea</i> Morelet	Caribaea pine	Nicaragua, Guatemala, the Bahamas
<i>Pinus oocarpa</i> Schiede	Pine	Nicaragua, Mexico, Guatemala, Honduras, El Salvador
<i>Swietenia macrophylla</i> King	Mahogany	Central & South America
<i>Swietenia mahogani</i> Linn	True Mahogani	North America, Cuba, the Bahamas
<i>Tectona grandis</i> Linn	Teak	South-east Asia
<i>Xylia dolabriformis</i> Benth	Pynkado	Burma, India

**Table 2.**

**An Abridged List of Alien Invasive Species of Fishes Introduced in Bangladesh (Source: DoF, 2000)**

Name of Species	Common Name	Natural Habitat	Country of Origin	Year of Introduction
<i>Trichogaster pectoralis</i> Regan	Siamese Gourami	Thailand	Singapore	1952
<i>Carassius auratus</i> (L.)		Europe, Asia	Pakistan	1953
<i>Tilapia mossambica</i> (Peters)	Tilapia	Africa	Thailand	1954
<i>Lebistes reticulatus</i> (Peters)	Guppy	S. America	Thailand	1957
<i>Cyprinus carpio</i> var. Communis (L.)	Common carp /Scale carp	Temperate Asia, Europe	Not known (India?)	1960
<i>Ctenopharyngodon idellus</i> (Cuvier & Valenciennes)	Grass carp	China	Hongkong, Japan, Nepal	1966 1970 1979
<i>Hypophthalmichthys molitrix</i> (Cuvier and Valenciennes)	Silver carp	China	Hongkong Japan	1969 1970
<i>Oreochromis niloticus</i> (L.)	Nilotica	Africa	Thailand	1975
<i>Puntius gonionotus</i>	Thai Sarpunti/ Rajpunti	Indonesia Thailand, Malaysia Philippines	Thailand	1986
<i>Cyprinus carpio</i> var. <i>Specularis</i> (L.)	Mirror Carp	Temperate Asia, Europe	Nepal	1979
<i>Aristichthys nobilis</i> (Richardson)	Bighead carp	China	Nepal	1981
<i>Mylopharyngodon piceus</i>	Black carp/ Snail carp	China	China	1983
<i>Clarias gariepinus</i>	African magur	?	Thailand	1989
<i>Pangasius sutchi</i>	Pangas	Thailand Indochina	Thailand	1990
<i>P. giganticus</i>	Giant Pangas	?	?	?

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