

# Stock Enhancement Activities in the Union of Myanmar

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## Introduction

The geography of the Union of Myanmar favors the existence of almost 700 species of marine and freshwater fauna. The resources are diverse and consist of indigenous, economically important commercial species, as well as ornamental species.

The fertile continental shelves, dense mangroves and coral beds along the coastal stretch are prime spawning and feeding grounds for a wide variety of species. Increasing demand for finfish, crustaceans and mollusks for food as well as for ornamental purposes has resulted in the over-exploitation of resources.

## Endangered Species

In Myanmar, two freshwater fish species, Asian arowana *Scleropages formosus* and giant catfish *Pangasianodon gigas*, and two marine fish species, whale shark *Rhincodon typus* and seahorse *Hippocampus kuda* are currently listed in the Convention on International Trade of Endangered Species of Fauna and Flora (CITES) appendices.

## Myanmar Wild Life Law

The following species are found in the list of protected species under the Myanmar Wild Life Law:

- Tubenose stickleback *Indostomous paradoxus*
- Carp *Osteobrama vigorsii*
- Butter catfish *Silonia silondia*
- Upside-down catfish *Mystus leucophasis*

Exploitation of endangered species is strictly prohibited hence, there are no recorded catches for these species.

## Status of seed production technologies

Seed production in Myanmar is focused on freshwater fish – carps (breeding by hypo physation method), tilapia, and catfish. Seeds of freshwater fish are produced in millions for distribution to grow-out farms and for stock enhancement.

## Aquatic Resources Management

### Fisheries laws

Fisheries resources in Myanmar are important for livelihood and food security. Export earnings from the fisheries sector rank third after agriculture and forestry products. These resources are categorized into inland fisheries, coastal and marine fisheries, and aquaculture.

The Department of Fisheries (DOF) has enacted the following laws for fisheries management:

1. Freshwater Fisheries Law (1991)
2. Myanmar Marine Fisheries Law (1990), amended in 1993
3. Law relating to the fishing rights of foreign fishing vessels (1989), amended in 1993
4. Aquaculture Law (1989)

### Freshwater Fisheries Law

The Law stipulates the following:

- a) Further development of the fisheries
- b) Prevention of the extinction of fish

- c) Prevention of the destruction of freshwater fish habitats
- d) Payment of duties and fees to the State
- e) Management of fisheries in accordance with the Law.

Regarding the prohibitions in fisheries, the Law states that:

- a) No one shall be allowed to do the following in any freshwater bodies of water:
  - Catching fish using explosives and toxic substances
  - Catching fish using prohibited implements and methods
  - Catching fish of prohibited size
- b) No one shall construct, install or maintain obstructive dams, banks, or wire fences in freshwater fisheries without permission from the DOF.
- c) No one shall be allowed to do the following within the boundary of creeks important to fisheries:
  - Cutting undergrowth or setting fire in fish habitats
  - Disrupting the flow of water
- d) No one shall be allowed to cause disturbance to fish and other aquatic organisms, or cause pollution in waterways in leased or reserved fisheries areas, and contiguous creeks.

Moreover, the legislation also describes penalties for violations.

#### *Myanmar Marine Fisheries Law*

The Law includes prohibitions on the following:

- a) No person shall engage in inshore and offshore fishery activities without a license.
- b) No person shall keep explosives and toxic substances on board fishing vessels for use in fishing.
- c) No person shall dispose of living aquatic organisms or any material into marine waters that would cause pollution or

disturbance to fishes and other marine organisms.

The Law also mentions the duties and powers of fisheries inspectors.

#### *Enforcement at different levels*

The DOF is the only competent authority for fisheries in the country. The DOF in collaboration with CITES and other organizations like the World Conservation Union (IUCN) and WCS constantly evaluates the status of existence and survival of aquatic resources in nature.

Myanmar has undertaken efforts to protect rare fauna and flora, within the context of food security issues and sustainable livelihood of the people managing the aquatic resources. The DOF has conducted aquatic resource management by regulating the collection according to species, season, fishing grounds, and implements. In this regard, fisheries officers at the provincial, district and township levels are the key force in monitoring and exercising management in collaboration with local authorities and related departments.

For commercial purposes, one can obtain the right to utilize fishery resources, in the country by procuring a license. However, fishing for household consumption is exempted from such license.

#### **Habitat protection**

In collaboration with the Forestry, Agriculture and the Irrigation Departments, the DOF actively participates in the protection of habitat, spawning and feeding grounds of aquatic animals.

There are wildlife sanctuaries and protected areas in Myanmar managed by the Forestry Department. The same Department also undertakes mangrove protection and replanting.

Table 1. Number of fish seed stocked into the natural waters of Myanmar from 1990 to 2005.

Year	No. of fish seed stocked (x 10 <sup>3</sup> )
1990-1991	3.25
1991-1992	6.00
1992-1993	3.80
1993-1994	7.25
1994-1995	64.70
1995-1996	124.46
1996-1997	50.00
1997-1998	33.00
1998-1999	65.37
1999-2000	56.98
2000-2001	85.80
2001-2002	92.80
2002-2003	134.30
2003-2004	218.60
2004-2005	236.50

### Stock Enhancement Programs

The State's vision is to assist the national economy by promoting livelihood programs for rural people through the development of the fisheries sector. To achieve such goal, one of the major activities is to undertake a stock enhancement program which has been implemented since 1983. The DOF subsidizes the annual seeding of freshwater fish and prawns into natural waters.

### Species stocked

Species used in seeding include common carp, tilapia, rohu, catla, and featherbacks fish, freshwater prawn *Macrobrachium* and tiger shrimp *Penaeus monodon*. Activities include annual stocking of seeds in the Ayeyarwaddy River and its tributaries, lakes, reservoirs, dams and other bodies of water. The annual seeding program has recorded millions of fish seed stocked from 1990 to the present (Table 1).

### Impact on catches

Among the species listed in the CITES, the Asian Arowana has commercial value as ornamental fish. Arowana are found in the stream at Tanintharyi Division. The giant catfish *P. gigas* inhabit the upper Ayeyarwaddy River and its tributaries in the north. However, these species are not exploited for commercial purpose.

The whale shark is not a popular food fish and it is not a target species by the local fishers. The anchovy surrounding nets in the Rakhine coastal areas often accidentally caught sharks but usually released back into the sea. Since early 2000, the increasing price of shark meat due to export demand has been attracting local fishers to target this animal. In this regard, the DOF enhances activities in educating the fishers to safeguard endangered species and takes actions in accordance to Fisheries Laws to those who violate.

*H. kuda* and other seahorse species are found in all coastal areas in Myanmar. Recently, people in coastal areas became interested in seahorse because it commands an attractive price. Seahorse is used by the Chinese as traditional medicine. These animals are caught using the anchovy surrounding nets.

Among the species protected under the Myanmar Wildlife Law are tubenose *I. paradoxus* and upside-down catfish *M. lucophasis* which are valued as freshwater ornamental fish. *I. paradoxus* is found in Indaw Gyi Lake at Kachin State in northern Myanmar. The upside down catfish inhabits rivers and streams in lower and upper Myanmar. The sustainability of this species in natural habitat has been threatened since the demand for export is increasing. In this regard, the DOF has controlled its export.

The carp *O. virgossii* and butter catfish *S. silondia* are popular food fish. *S. silondia* is

one of the expensive food fish in Myanmar. They thrive in rivers and large streams of upper Myanmar. Since the late 1990s, the catch has gradually declined and scarcely seen in local markets. This may be due to overexploitation or destruction of their habitat. Currently, the DOF has undertaken efforts to conserve these species through Myanmar Wild Life Law.

### **Monitoring**

Stock enhancement activities, protection and conservation are mainly monitored by the fisheries inspectors in collaboration with local management authorities, the Forestry Department and the police force.

The DOF is the only competent authority to monitor and conduct fisheries related activities. The Myanmar Fisheries Federation is the most competent NGO in fisheries supporting the activities of the DOF.

### **Co-management by local communities**

Attempts have been made to increase awareness in fisheries co-management to sustain resources through responsible fisheries and aquaculture practices. The activities are implemented with transparency. The stock enhancement and conservation activities are participatory with support and co-management from stakeholders.

### **References**

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