

# Nursery Culture of Tropical Anguillid Eels in the Philippines

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# Foreword

Anguillid eel farming is reliant on wild-caught juvenile stages such as glass eel, elver and yellow eel. However, with the decline in the collection of temperate anguillid eel juveniles in recent years, tropical anguillids have drawn more attention to compensate for the shortage of seeds for eel farming. With the interest in tropical anguillids, proper conservation and management is essential to prevent overexploitation and listing in the CITES appendices.

SEAFDEC organized an international regional workshop on “Enhancement of sustainability of catadromous eel resources in Southeast Asia” on 27-29 April 2016 which identified the lack of baseline information on the status of anguillid eel fisheries and aquaculture among ASEAN Member States. There were also identified gaps on the management practices to ensure the sustainability of eel resources.

Following the workshop, a project on “Enhancing sustainable utilization and management scheme of tropical anguillid eel resources in Southeast Asia” was conceptualized with funding through the Japan-ASEAN Integration Fund (JAIF). To determine the status of tropical anguillids in the wild towards the proper management of eel resources in ASEAN Member States, baseline and regular surveys and compilation of catch statistics were conducted jointly by SEAFDEC’s Secretariat and Inland Fishery Resources Development and Management Department. Meanwhile, SEAFDEC Aquaculture Department is tasked to improve aquaculture practices to improve survival rates and the compilation of good eel culture practices and technologies in a manual.

This manual documents the on-farm practices of anguillid eel farms in the Philippines as well as the results of rearing trials conducted at SEAFDEC/AQD to improve growth and survival. Species identification and health management approaches have also been documented. It is hoped that more efficient nursery practices will improve the income of local eel farmers and ease some of the pressure on wild stocks. Along with the proper management of wild anguillids, SEAFDEC/AQD looks forward to the further development of eel aquaculture towards a truly sustainable industry.



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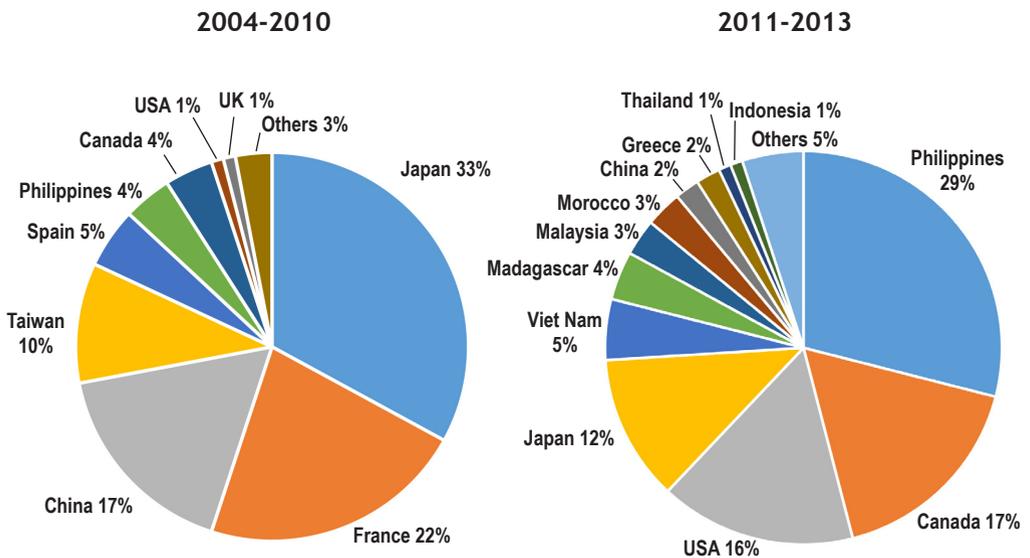
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# Introduction

Various life stages of anguillid eels have been commercially exploited and traded internationally. Anguillid eel farming started in 1879 in Japan and in the 19<sup>th</sup> century in Italy and France. By the year 2000, at least 24 countries have been culturing eels. Expansion of the culture of anguillids is mainly market driven. Anguillid eels have been traditionally cultured in East Asia, the United States and Europe. The bulk of world production is from aquaculture. However, supply of seed is dependent on collection from the wild. With the decline in the population of the temperate eel species like the European, Japanese and American eel, *Anguilla anguilla*, *A. japonica*, and *A. rostrata*, respectively, various conservation and management measures to protect these species from further decline have been put in place such as catch and trade limits. To fill the gap in the demand for the traditional anguillid eel species, the tropical anguillid eel fishery in Southeast Asia has been tapped. This resulted in a significant increase in the export of live eel fry from some Southeast Asian countries, the Philippines in particular. From a 4% contribution to live glass eel export to East Asian countries between 2004 and 2010, the Philippine contribution increased to 29% by 2011 and 2012 (Figure 1). This upward shift coincided with the imposition of restrictions on the fishery and trade of temperate eel species, particularly the European eels.



**Figure 1.** Percent contribution of various sources of live glass eels imported into mainland China, Taiwan, Japan and Korea. Source: *East Asian Customs data as cited by Crook, 2014.*

The increased fishing pressure on glass eels in some Southeast Asian countries has resulted in regulatory and management measures for the species. For instance, regulations on the export of anguillid eels as a way to manage and conserve the resource have been put in place in some states. In Indonesia, legal size for export of glass eels is 150 g. In the Philippines, the minimum legal size for export is above 15 cm elvers. Previous to this size limitation on export of anguillids, both countries had a thriving export industry for glass eels. The size regulation has prompted the development of the anguillid eel culture industry in these countries to achieve production volumes of the target legal export size. Tropical anguillid elver production in the Philippines is primarily targeted for export to East Asian countries as an alternative species to the Japanese eel. This technical publication will focus on nursery production of anguillid eels from glass eels to elver using data gathered from eel farm surveys and rearing trials conducted by SEAFDEC/AQD as part of the JAIF (Japan-ASEAN Integration Fund) project on Enhancing Sustainable Utilization and Management Scheme for Tropical Anguillid Eel Resources in Southeast Asia.