A review of export trade of indigenous aquatic plants species in Sri Lanka and their conservation issues

R.D.C. Bandaranayake, B.V.A.M.S. Bambaranda and S.C. Jayamanne
Faculty of Animal Science and Export Agriculture, Uva Wellassa University of Sri Lanka

and

R. D. A. M. G. Niyarepola
Biodiversity, Cultural and national Heritage Protection Division of Sri Lanka Customs, Customs House, No 40, Main Street, Colombo 11

Introduction

Aquatic plants are adapted to aquatic environments and are required special adaptations for living submerged in water or at the water's surface. In addition to various ecological and industrial values, most of aquatic plants are having ornamental value. Due to the ornamental value of the aquatic plants, they have a huge demand and are exported from Sri Lanka. Along with ornamental fish industry, aquatic plants are introduced and exported as a simultaneous industry. Present study was intended to analyze and evaluate the trade of ornamental aquatic plants in Sri Lanka with a particular focus on indigenous species. The objectives of the study are determine the exported species and their quantities, the actual foreign exchange earnings, identify the conservation issues related to indigenous species, identify the trends to occur irregularities in exportation procedure and propose suitable.

Materials and Methods

Exported aquatic plants species data and their quantities were extracted from the Customs Goods Declaration Forms (CusDec) submitted by the ornamental aquatic plants exporters to the Air Cargo Terminal in Katunayake under the Department of Sri Lanka Customs. The Customs Goods Declaration Forms submitted during the period of one year from 1 st March 2013 to 28 th February 2014 were analyzed. A questionnaire was also used to gather information regarding the conservation issues through ornamental aquatic plants exporters, Custom officers at frontier and local villagers.

Results and Discussion

During the one year period from 1 st March 2013 to 28 th February in 2014, a total of 218 species of aquatic plants has been exported to 43 countries from Sri Lanka. Among the total, 176 species were indigenous, 1 species was endemic. When considering the total quantities of exported indigenous aquatic plants during the one year period, the most common species exported was the *Dracaena sanderiana white* (168185 individuals) and *Lobelia cardinalis "small leaf"*(4 individuals) was the species exported in least quantities. During the one year study period, 1504531 individuals of aquatic plants and 2047620 all types of live plants have been exported from Sri Lanka. When considering the proportions of species exported during one year period, the endemics consist of 0.04% (685individuals) and other indigenous species consisted of 80.91%(1217353individuals) among all other aquatic plants. The proportion of indigenous aquatic plants species consisted of 59.45% and endemics consisted of 0.03% among exported all types of live plants from Sri Lanka. And the proportion of exported aquatic plants to all live plants is 73.47% from Sri Lanka during my study period.

The foreign exchange earned from ornamental aquatic plant industry has shown a considerable level of earnings. The all individual export prices of species ranged from US $ 0.14 to US $ 12.99. Among all exported indigenous aquatic plant species, *Echinodorus grisebachiibleheri* has earned highest amount (SL Rs. 84,051,603.55) while *Dracaena sanderiana* baskets have brought in the least earning (SL Rs. 199.06) during the concerned time period.

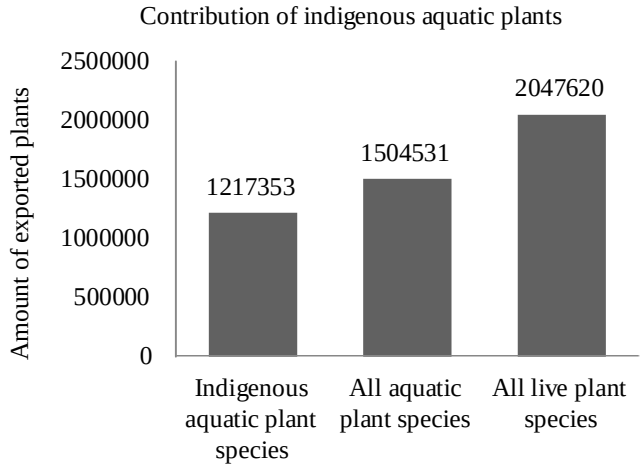

Figure5: Indigenous aquatic plants contribution to the all live plants exported

Total income generated from the ornamental aquatic plant trade during one year period was SL Rs.546,950,172.67 (US $ 813,735.45).When considering the earnings, contribution of indigenous aquatic plant species was SL Rs. 447,667,856.28 (US $ 3,373,279.00) and it was 80.16% from total export of ornamental plants. The earnings obtained from the endemic aquatic plant species was SL Rs. 499,075.86 and contribution is 0.091% for the aquatic plant industry. The contribution of the endemic plants to the all live plants exported is negligible (0.089%). Finally, the contribution of the ornamental aquatic plants for all exported live plants is 97.94%.

There were only 13 exporters who actually engaged in exportation of live ornamental aquatic plants during my study period. From that, all exporters were identified as indigenous aquatic plant exporters who are occationally export endemic species based on the foreign demand. The exporters are not extracting plants from the wild and contribution of nurseries production of plants for export is 100%.

Since, in spite of all precautionary measures are taken by Biodiversity, Cultural and National Heritage Protection division of Sri Lanka Customs, maximum advantage of loopholes in regulations is taken by smugglers through false declarations and misleading terms. According to the approximate calculations of previous offences committed by exporters who were found guilty in the Customs detections (As per the information found in Casefiles), SriLanka Customs had detained ("Kekatiya") *Aponogeton crispus* (US $ 730,325) and *Cryptocoryne species* (US $ 1800) on the suspicion of violation of regulations under the Forest Ordinance and Custom Ordinance which were attempted to export through BIA, Katunayake without having permission. Those smuggled aquatic plants have collected from several tanks in Puttalum and Kurunegala districts.

The sustainability of the ornamental aquatic plants industry and the conservation of endemic and indigenous aquatic plants can be mandated and committed by enforcement of existing laws and legislations. The greatest thing is long run economical gains obtained through the protection of ecosystems than any short term economic return earned from smuggling, over exploitation like undesirable activities. If the involvement of the government authorities is in a sufficient condition,

the due revenues from the trade can be increased. But the legal status behind the export of endemic plants species hampers their development and therefore, investments are worthless until legal status are cleared and positively regulated. Adequate culture techniques are not practiced by the exporters to boost the industry with new technology and conservation of the endangered species. The major factors which are responsible for the depletion of water plants from the natural environment are deforestation, constructions, sand and gem mining, bad practices of fish harvesting methods, agricultural and industrial wastes, over exploitation and invasive species. Therefore the government should involve for collaborate all those parties for a sustainable trade of aquatic plants in Sri Lanka and awareness should be created among all stake holders of ornamental aquatic plants industry including officers at frontiers, exporters, farmers, students, conservationists and all related agencies.

Conclusion

During the period of one year from 1st March 2013 to 28th February 2014, 176 aquatic plants species were indigenous out of all 218 species identified. The quantity of exported indigenous aquatic plants species has shown a considerable proportion to exported aquatic plants species, 80.91%. It is noteworthy to highlight that 73.47% of the entire export quantity of annual live plants trade consist of aquatic plants species. The calculated actual foreign exchange earnings from exported indigenous aquatic plants species was 80.16%. The main causative factors should be minimized to address conservation issues such as constructions, deforestation, sand and gem mining, industrial and agricultural wastes and invasive species. Based on the gathered information from the exporters, there are no exporters who practice wild collection of endemic species. The irregularities at the exportation procedure are taken place basically due to false declarations and misleading terms. Therefore, the laws and regulations should be enforced and monitored to avoid misconducts and corruptions.

Acknowledgement

Firstly I would like to convey my greatest gratitude to Head, Department of Animal Science Dr. S.C. Jayamanne and to my internal supervisors, Mrs. B. V. A. S. M. Bambaranda and Dr. S. C. Jayamanne. Then special thanks all the staff members of the Aquatic Resources Technology degree program. And I convey my special gratitude to my external supervisor Mr. R.D.A.M.G. Niyarepola, Deputy Director of Customs who strengthened me with his advice and guidelines during my research period. Also, I want to thank Dr. W. M. H. K. Wijenayake, for his kind guidance and support during my research.

References

I.U.C.N.2007.*Red list of Threatened species*. The World Conservation Union (IUCN) and Ministry of Environment and Natural Resources, Colombo, Sri Lanka.

Yakandawala, D. and Yakandawala, K. 2007. Ornamental aquatics: *potential weeds in aquatic ecosystems*. Proceeding of the 21st Asian Pacific weed Science Society Conference, Colombo, Sri Lanka: 222-225.