Silent threat to Sri Lanka's biodiversity: laws relating to Invasive Alien Species

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Abstract— *Incidents such as reduction of forge grasses that can be used by elephants due to rapid spreading of Lantana in Udawalawe National Park and growth of common gorse in Horton National Park indicate that there is a silent threat to the biodiversity of Sri Lanka. The spreading of invasive alien species has been identified as the main reason for the aforesaid threat. Invasive alien species are a part of alien species who will survive, inhabit and spread beyond their areas and purposes of introduction. The impact caused by these species is ranked as the second most serious threat to biodiversity of countries. Invasive alien species assessment conducted in 2016 states that there are 32 flora species and 7 fauna as species named as invasive alien species priorities in Sri Lanka. These species cause impacts in different sectors including biodiversity loss, economic effects and health issues. Invasive alien species(IAS) require expensive control and management with Rs 33 million spent between 2010- 2014, the department of irrigation has incurred costs of Rs 324 million from 2008 on cleaning tanks, canals and water ways. Therefore it is essential to have a specific set of laws to address the mass destruction of biodiversity caused by these species. The existing legal framework does not directly address this growing threat. The main objective of the research is to distinctly identify the legal principles and laws that are applicable in this area. This area of study provides evidence of identifying the importance of soft law in the process of protecting the environment. The researcher attempts to highlight the contribution of international environmental law in this area and the importance of a synergy between law and biodiversity protection mechanisms. Furthermore the Sri Lankan context is discussed in the research. In Sri Lanka there are certain laws indirectly addressing the issue of invasive alien species. However, the unavailability of a specific legislation to control or eradicate invasive alien species and to protect the biodiversity of the country undermines the policy initiatives. The author seeks to analyse the existing legal framework and intends to suggest recommendations for effective implementation of the laws. Legal research methodology is followed in this research. Qualitative analysis of data is used in the research. Both primary and secondary data are used in the research. Primary data includes international conventions, laws and Books, journal articles and web articles are used as secondary sources.*
The legal framework in South Africa and European Union was used to suggest recommendations. Regulations introduced by other jurisdictions.

Keywords— Invasive Alien Species, biodiversity loss, Environmental Law

I. INTRODUCTION

"Humankind has not woven the web of life. We are but one thread within it. Whatever we do to the web, we do to ourselves. All are bound together. All things connect."
(Chief Seattle)

Interconnected and interdependent nature of man and environment reminds us the importance of protecting the environment for the existence of the web of life. Biodiversity protection is important for sustainability of all forms of life. The protection of biodiversity has been recognized as a priority area in International Environmental Law (Justin Pidot,2006). The threats caused by Invasive Alien Species (IAS) to the biodiversity is irreversible. Most of the developed countries including United States of America and European Union member countries are concerned about this global challenge. Little attention is drawn to the legal mechanisms surrounding this global threat. Therefore it is important to look at the international legal framework and the Sri Lankan legal framework and identify possible opportunities to successfully control this threat. A synergy between international standards and the Sri Lankan position is considered as an essential mechanism to protect the biodiversity of Sri Lanka and the world at large.

It is pertinent in this backdrop to observe the Sri Lankan position and the legal framework to face this global challenge. Sri Lanka together with the Western Ghats of India is identified as one of the 34 global biodiversity hotspots in the world by Conservation International. World Wildlife Fund's Global 200 has identified Sri Lanka as containing one of the most biologically distinct freshwater, terrestrial and marine eco-regions of the planet. Therefore the biodiversity conservation in Sri Lanka is a paramount interest to protect the biological diversity of the world.

Initial introduction of foreign species to Sri Lanka took place during the colonial period. Developments in agriculture, aquaculture, horticulture and exotic pet industry as a result of liberalization of the economy in 1970s opened up doors to the introduction of invasive alien species to the country. Ministry of Mahaweli Development and Environment has listed the spread of invasive alien species as one of the environmental challenges Sri Lanka is faced with. Invasive alien species risk assessment in 2016 states that there are 32 flora species and 7 fauna species identified as causing threat to the biodiversity. Among them Invasive alien species (IAS) priorities include Water Hyacinth, Giant Salvinia, Guinea Grass, Prickiy Pear, Lantana, Rainbow Trout and Tank Cleaner.

It is evident that a strong legal mechanism is essential to address the issue. This area of study has attracted attention of biologists and international legal scholars. However, less attention is drawn to the Sri Lankan legal system. Therefore this research is focused mainly on the domestic legal framework. The author intends to identify the gaps in the existing laws relating to IAS and intends to suggest recommendations. Although there are many areas under the threat of IAS the research is limited to the threats caused by IAS to biodiversity.

II. INVASIVE ALIEN SPECIES

An alien means an animal or plant that is non-indigenous to a country or region and has been brought from some other place. An invasive is a species that breeds fast and spreads widely adversely affecting native biodiversity (Gunawardena J, 2001). Invasive alien species can be generally defined as a fraction of alien species who will survive, inhabit and spread beyond their areas and purpose of introduction. The definitions adapted to define the term invasive alien species exhibit a range of diversity in international and domestic levels. Some countries still have debates and confusions with regard to the basic terminology necessary to define and discuss the threats of IAS (Marc L, 2001). The Convention on Biological Diversity Decision VI/23 defines IAS as species of plants, animals, and micro-organisms introduces by human action outside their natural, past or present distribution (this definition is recognized in Sri Lanka as per the National Invasive Alien Species Policy 2012). Definition used by the European Union is similar to that of the convention (IAS Regulation, Article3(2)). In contrast to aforementioned definition the definition adapted by United States of America identifies an IAS as a species " whose introduction does or is likely to cause economic or environmental harm to human health"(Executive Order 13112, 2000). Latter definition incorporates a wider scope into the IAS term, main reason can be the high level of risk America face due to IAS.

Invasive alien species include both fauna and flora. These species enter a country by intentional or unintentional methods. Unintentional methods of introduction takes place by national and international trade, shipping, agriculture, fisheries, tourism, horticulture, forestry, construction projects, pet trade, aquaculture, ground and air transport and landscaping.

III. IMPACTS OF ALIEN INVASIVE SPECIES

Most invasions by alien species have a weak impact, but in some occasions they are capable of precipitating monumental changes to an ecosystem (McCann,2000). Human ecological mismanagement often leads to the introduction of invasive species (James Ming Chen,2016: Cox,1999:Williamson,1996). World Conservation Union states that the impacts of alien invasive species are immense, insidious and irreversible. Furthermore IAS is considered as one of the greatest vectors of biodiversity loss in the present world (Justin Smith Morrill, 2016). These species are aggressive in claiming new territories, they destroy the areas they claim and they kill silently without remorse (Kelly J. Cox,2016). At a global scale, IAS are recognized as the second largest threat to biodiversity and as a major cause of species extinctions (Clavero M,2005)

Threats caused by IAS to native species include direct exploitation or destruction, competition for resources and hybridisation (Marambe B, 2010). For example, the Tenacious terrapin is a popular pet reptile endemic to North America. The species was introduced to Sri Lanka by aquarists in the 1980's. This species is the only turtle listed in the International World Conservation Union list of the 100 most invasive species on the planet. Sliders depend on local fish spawn and can be aggressive towards other turtles. They compete for food and nesting with vulnerable endemic species.

IV. GUIDING LEGAL PRINCIPLES

To eradicate, control or regulate the damages caused to biodiversity by IAS requires a clear understanding of applicable legal principles. The legal principles used in this area of study will be analysed in this section. Interim Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species is used as a guide.

The main underlying legal principle applicable in this area is precautionary principle. The preamble to the Convention on Biological Diversity confirms this fact by stating that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to minimize a threat. The guiding principles introduced by Conference of Parties (COP) Decision VI/23 encourages State Parties to use a precautionary approach in making laws and policies relating to IAS. The precautionary principle is also incorporated in principle 15 of the Rio Declaration on

Environment and Development of 1992 and it is considered as a general environmental principle.

The unpredictability of the impacts on biological diversity by alien species has led to the use of precautionary approach in the IAS laws and regulations. Therefore it is essential for States to make efforts to identify and prevent unintentional introductions and to take decisions to avoid intentional introductions based on the aforesaid principle. Lack of scientific certainty about the environment, social and economic risks posed by a potentially invasive alien species or by a potential pathway should not be used as a reason for not taking preventive action against the introduction of potentially invasive alien species. Moreover, lack of certainty about the long term implication of an invasion should not be used as a reason for postponing eradication, containment, or control measures (COP 6, 2000).

In this context the control of IAS entering pathways have adapted the precautionary approach. The distinction between intentional introductions and unintentional introductions play a crucial role in understanding the nature of introduction of IAS to a country. One basic distinction is between alien species brought into a country, area or region intentionally with the knowledge and purpose of an individual or corporate entity and those species brought into a country unintentionally or accidently through the lack of knowledge or negligence of a person or a corporate entity. Marc L states that reckless behaviour as a behaviour, where an individual or the representatives of a corporate entity know that there is a substantial risk of introducing alien species. Here this category of acts have a tendency to be included either to intentional or unintentional behaviour depending on the level of awareness of the risk, degree of the risk and the purpose of the classification.

There exists many grey areas in the distinction between intentional and unintentional introductions. The instance where a species is introduced intentionally and subsequently becomes an IAS provides evidence for such uncertainty. The introduction can be made intentionally where the introducer could not foresee such harm. A risk assessment process with an environmental impact assessment that allows introductions only for alien species unlikely to cause unacceptable harm and where anticipated benefits strongly outweigh any actual and potential adverse effects and related costs is important to be used.

Furthermore, the States have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or to areas beyond the limits of national jurisdiction. This obligation is vested on the States in accordance with Article 3 of the Convention on Biological Diversity and principle two of Rio Declaration in Environment and Development. The acts which are to be recognized as to apply state responsibility includes the intentional or unintentional transfer of IAS to another State and the introduction of IAS into their own State if there is a risk of that species subsequently spreading into another State and becoming invasive.

IV. INTERNATIONAL STANDARDS

This part of the paper provides an analysis of the identification of the threat of IAS in the international legal frameworks. On one hand there is a clear availability of soft laws requesting State Parties to adapt laws to control this global threat. On the other hand the lack of complete and coherent laws with regard to IAS the difficulties in perception of everyday human observation of the environment (Marc L,2001)

The Convention on Biological Diversity (CBD) is the main international convention relating to this area. The convention entered into force in 1993 as a result of the United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992. The CBD requires governments to take appropriate measures to conserve biological diversity, ensure the sustainable uses of biological resources, and promote the fair and equitable sharing of benefits arising from the utilisation of genetic resources (McNeely, 2001). The governments have agreed to prepare national biodiversity strategies and action plans, identify genomes, species and ecosystems which are highly important for conservation and sustainable use, monitor biodiversity and factors that are affecting biological systems, establish systems of protected areas, exchange information and rehabilitate degraded ecosystems. Article 8(h) of CBD calls all State Parties to prevent the introduction of, control or eradicate alien invasive species which threaten ecosystems, habitat, or species. This article is the most important article which specifically identify the threat of IAS. With the lapse of time the international community recognized the requirement of further action in the international arena to strengthen the initial legal step. Global Invasive Species Programme (GISP) was introduced as a result to address the global threats caused by invasive alien species and to provide support to the implementation of Article 8(h) of the CBD.GISP is operated with the cooperation of the Scientific Committee on Problems of the Environment (SCOPE), CAB International, World Conservation Union (IUCN) and United Nations Environment Programme (UNEP).

Furthermore, the International Plant Protection Convention (IPPC) is aimed at taking effective action to prevent the spread and introduction of pests of plants and plant products and to promote appropriate measures to control them. Although the IPPC does not specifically state about IAS its scope can be expanded to include invasive alien species that may be considered to be a plant pest (global strategy on invasive alien species, 2001).

Many countries have adapted Acts specifically addressing the threats caused by IAS. These countries reveal varying degrees of recognition at the level of law and policy that IAS are a threat to the biodiversity.

A. *European Union*

European species and ecosystems are under the threats from IAS. Over 12,000 alien species have been documented to occur I Europe. Roughly 15% of these species are considered invasive, causing adverse impacts on European nature (Vila et al, 2010). Legal framework governing IAS is under the two umbrella conventions, the CBD at the global level and Convention of European Wildlife and Natural Habitats 1979(Bern Convention) at the European level. European Union (EU) Regulation 1143/2014 which entered into force in 2015 is a result of the relation between the Bern Convention and EU biodiversity law. The EU regime on IAS is well tailored and the legal framework provides cooperation among countries and opportunity to implement effective and sustainable measures in the European war against IAS (Epstein, 2015).

B. South Africa

A specific legislation and set of regulations are enforced in South Africa. The National Environmental Management: Biodiversity Act 10 of 2004 is the main Act which address the threat of IAS. Part 1 of the Act is allocated to Alien species (Article65-69) Part 2 relates to Invasive species (Article 70-77). Article 71 restricts the activities of people with listed invasive species. If a person intends to use an invasive species, that person should obtain a permit from the relevant authorities. A permit is issued only after a prescribed assessment of risks and potential impacts on biodiversity is carried out. A special duty of care is imposed on a person authorised by permit to use a listed invasive species. He is required to take steps to prevent or minimise harm caused to the biodiversity. If a listed invasive species is present on a land, the owner is required to notify relevant authority in writing of such occurrence and should take all steps to prevent or minimise the harm caused to the biodiversity. Failure of that person to comply with such directive will empower a competent authority to recover all costs of damage. The presence of aforementioned legal provision facilitate the effective implementation of the international standards. These articles highlights the importance of collective effort by citizens and the government. The Biosecurity Unit of the Department of Environmental Affairs is mandated by the Act to manage legislation relating to IAS. Regulations are periodically enacted to face the dynamic threat by IAS.

It is clear that there is a developing interest in the international legal arena to develop effective legal mechanisms to face the IAS challenge.

V. SRI LANKAN STANDARDS

Constitution of the Democratic Socialist Republic of Sri Lanka in Article 27 (14) under the directive principles of state policy states that the state should protect, preserve and improve the environment for the benefit of the community. On the other hand the Article 28(f) of the Constitution vests a fundamental duty on every person in Sri Lanka to protect nature and conserve its riches. Furthermore, Sri Lanka possess sovereign rights to exploit its own resources pursuant to its environmental policies in accordance with Charter of United Nations and the principles of international law (CBD, Article 3).

The study reveals that a satisfactory policy background to tackle the IAS is present in Sri Lanka. When the legal framework is considered, there are four main statutes which address the issues relating to invasive alien species. One major observation is that there is no clear reference to the term invasive alien species. There are gaps in the existing legal framework which hinders the effective implementation of policy initiatives.

Fisheries and Aquatic Resources Act No. 02 of 1996 for instance was enacted to manage, regulate, conserve and develop the fisheries and aquatic resources. Section 30 of the Act provides that the Minister in Charge of fisheries and aquatic resources and Minister in Charge of trade can prohibit or regulate the export from, or import into Sri Lanka of any species of fish including live fish or any eggs, roe or spawn or any products prepared from such fish, egg, roe or spawn at other aquatic resources for a period specified in the order. Here the prohibition can be exercised only if the species had been identified as causing threat to fishes and aquatic resources, the Act does not include provisions to take action for a species that has become or is likely to become an invasive species.

In the Fauna and Flora Protection Ordinance(Amendment) Act No 22 of 2009 under Article 37 requires the authority of a permit to import any animal, spawn, eggs or larvae of any animal. This helps to control the entry of invasive species to the country. Absence of provisions to tackle with a species becoming an invasive species after the introduction to the country under a permit undermines the effectiveness of the law.

Plant Protection Act No. 35 of 1999 intends to prevent the introduction and spread of any organism injurious or harmful to plants or destructive to plants. Provisions are incorporate to prevent entry of any plant or animal that may become a pest or invasive, or potential threat to plant life. Control of an already introduced species or a species that can be invasive with a potential to be introduced is not covered by the provisions.

Marine Pollution Prevention Act No. 35 of 2008 provides opportunity to bring in necessary regulations to control and regulate the release of ballistic waters in to the sea. Despite the laws and policies, the legal framework still

remains unclear (Marambe, 2010). A key legislation incorporating a comprehensive legal framework to enhance eradication, control and regulation of invasive alien species is crucial for the implementation of the policies.

Furthermore, Sri Lanka being a signatory to international and regional agreements such as World Trade Organisation Agreement, South Asian Free Trade Area Agreement, International Plant Protection Convention and International Convention for the Prevention of Pollution from Ships requires to establish a clear legal framework. Majority of scholars have pointed out that even though there are better laws and implementation mechanisms in most of the developed countries, there are gaps in the level of compliance by developing countries. This is a remarkable threat to the biodiversity of the world as majority of world's biodiversity hotspots are located in developing countries. The silent threat that these invasive alien species cause to the rich biodiversity of Sri Lanka which provides a multitude of ecosystem goods and services to more than 20 million of its inhabitants is considered as a crucial issue (National Report to the Conservation on Biological Diversity, 2014).

VI. RECOMMENDATIONS

Given the inadequacy of the current legal framework to successfully face the growing challenge of IAS in the country it is of vital importance to adapt a legal framework to protect our unique biodiversity. The author recommends the enactment of the draft Invasive Alien Species Act as a step forward to regularize and to supplement the policy initiatives. Presence of an organized set of laws including a statue and regulations is seen as a key to enhance the steps taken to tackle the IAS issue.

Furthermore, it was clear from the study that ambiguities exist in the interpretation of the guiding principles. Clear identification of principles and their application in Sri Lankan context is required.

When the scientific body of knowledge on IAS expands with research, the legal mechanisms must evolve in line with the former. (Nicholas B, 2003). The adaption of timely regulations by carefully considering the scientific experimental results is essential to address the dynamic nature of the threats caused by IAS.

Eradication and control of invasive alien species requires a strong coordination of information between the key stakeholders and the public. Conducting continuous awareness programmes helps in the dissemination of information relating to the identification of IAS, knowledge on the impacts of IAS necessary and the actions that are to be taken.

Use of traditional knowledge, innovations and methods of customary practices of sustainable use of biodiversity of indigenous people on the conservation of biodiversity would help to take productive measures to control IAS spreading in wildlife reserves. Ensuring the rights of indigenous people will provide an opportunity to such people to actively engage in biodiversity conservation.

VII. CONCLUSION

The silent threat that had become a global challenge for biodiversity loss is discussed in this research. Connection between man and environment should be strengthened in order to protect the biodiversity. The IAS threat discussed in this paper shows an instance where human mismanagement of species had contributed to biodiversity loss. It was clear from the above analysis that the segregated nature of the existing domestic legal framework does not provide a strong legal mechanism to answer the threats of IAS.

This research initially discussed a requirement of identifying the silent threat to biodiversity of Sri Lanka through an analysis of definitions on the term IAS and the impacts caused by IAS. Secondly, an attempt was made to identify the applicable legal principles to this area of study. Thirdly, a discussion on the international legal instruments and Sri Lankan legal background were considered. It was clear from the study that there is a rapid development in introduction of laws in the international level to enhance the compliance with the conventional obligation under Article 8(h) of CBD. It is evident from the study that the best method to face this global threat is a development of a close synergy between legal mechanisms, policy initiatives and public participation in both domestic and international contexts. Threat of IAS together with impacts of climate change have urged the global community to develop new mechanisms to protect the biodiversity from the modern challenges. Conservation of biodiversity is considered as a common concern of mankind (CBD, 1993). There exists a requirement of immediate action to protect the biodiversity of the world as an obligation to upheld sustainable development, intra-generational and intergenerational equity. This requirement is emphasised by Chen as follows,

"Humanity is now living through the sixth mass extinction where full restoration of such extinction requires 10 million to 100 million years. Therefore the loss of genetic and species diversity is probably the contemporary crisis our descendants will most regret and are least likely to forgive" (James Ming Chen, 2016).

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