

INVASIVE ALIEN SPECIES AND SUSTAINABLE DEVELOPMENT

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- **Invasive alien species (IAS)** are species introduced into places **outside their natural range** that have **negative impacts** on native biodiversity.
- IAS have major impacts on **human health, livelihoods and food security**, and undermine progress towards achieving many of the **UN Sustainable Development Goals**.
- The rate of new introductions is **increasing**, and the impacts from IAS can be **compounded by climate change**.
- IAS are **not only an environmental problem**, and a **cross-sectoral approach must be taken** to address them.
- **Preventative measures**, such as **biosecurity**, are the most cost-effective ways to tackle IAS.

What is the issue?

Alien or non-native species are animals, plants or other organisms introduced by humans, either intentionally or accidentally, into areas outside their natural range. Some of these species become established and negatively impact native biodiversity. These species are classified as invasive alien species (IAS).

Due to the increase in the movement of people and goods around the world, and with new trade routes opening and enhanced transportation, the number of species being introduced into new areas is rising. A 2017 study in the journal *Nature Communications* found that over one third of all introductions in the past 200 years occurred after 1970.

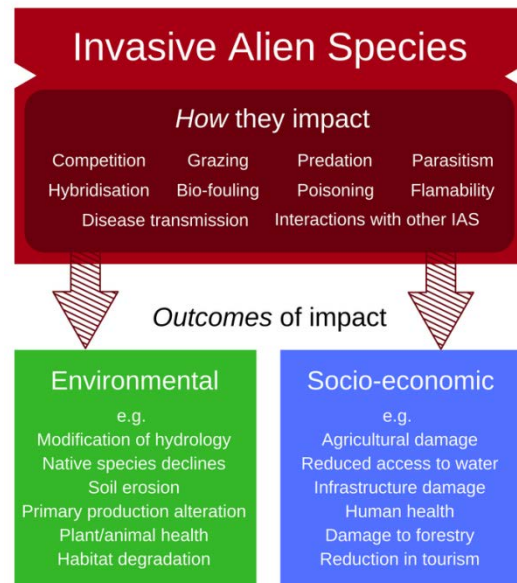
According to The IUCN Red List of Threatened Species™, **IAS are one of the top causes of biodiversity loss** and the second most common cause of **species extinctions**. The brown tree snake (*Boiga irregularis*), for example, is responsible for the extinction of 10 bird species on the island of Guam where it was introduced in the 1940s. IAS also constitute the most significant threat to natural World Heritage sites, affecting 68 out of 241 sites, according to the *IUCN World Heritage Outlook*.

IAS impacts go beyond biodiversity and also seriously affect economic activities, livelihoods, food security, and human health and well-being. Overall, IAS risk undermining progress towards achieving 10 of the 17 UN Sustainable Development Goals (SDGs).

Why is this important?

Though the scale of the socio-economic costs associated with IAS is poorly understood, it is estimated that the direct impacts of IAS and their management **cost the global economy billions of US\$ annually**. It is estimated that IAS cost the EU at least €12.5 billion/year, and Australia at least AUS\$13.6 billion/year. Invasive alien insects alone, due to their impacts on agriculture and forestry, cost at least US\$70 billion/year globally. The global cost of controlling invasive freshwater biofouling animals, such as the zebra and quagga mussels which accumulate on wetted surfaces

in electric power generation and water treatment facilities, is estimated at more than US\$277 million/year.



Impacts of invasive alien species © IUCN

The water hyacinth (*Eichhornia crassipes*), for example, which is native to South America, has been intentionally introduced around the world for ornamental purposes and as animal food, and has rapidly invaded water ways, irrigation channels, lakes and rice paddies. Under the right conditions it can double in biomass within two weeks forming dense mats, with potentially disastrous consequences. In Africa's Lake Victoria, water hyacinth infestations covering 12,000 hectares have blocked shipping trade and access to ports, and halted fishing activities, impacting 40 million people.

Agriculture and fisheries are particularly vulnerable to the impacts of IAS, placing **food security at risk** and **jeopardising livelihoods**. For example, the fall armyworm (*Spodoptera frugiperda*) was introduced to sub-Saharan Africa most likely from the USA in 2016, and is spreading rapidly across the continent causing yield losses of over 40% for smallholder maize farms in some countries. Mesquite (*Prosopis*), a thorny drought-tolerant shrub native to the Americas, was widely introduced to tackle the impacts of desertification but became invasive, forming impenetrable thickets in many

countries. In Ethiopia it has seriously affected the ability of pastoralist communities to rear their livestock.

IAS also pose a **threat to human health**, directly by exposing people to injuries and wounds e.g. through bites and stings, or indirectly by transmitting diseases through infectious pathogens, or providing suitable habitat for disease spreading organisms. The Asian tiger mosquito (*Aedes albopictus*), native to South-East Asia, is a vector of a number of human diseases such as Dengue fever and West Nile virus. It has spread to many countries around the world via shipping, surviving in standing water (e.g. used tires). The mosquito facilitates disease outbreaks such as the Chikungunya outbreak in the Indian Ocean islands of Réunion and Mauritius (2005-2006) where more than 272,000 people were infected.

The impacts from IAS can be compounded by climate change which can facilitate the spread and establishment of alien species. For instance, climatic events such as floods can bring invasive species into new areas. The resilience of natural habitats can also be reduced by IAS, making them more vulnerable to the impacts of climate change. For example, introduced grasses and trees may alter fire regimes, particularly in areas that are becoming warmer and drier due to climate change, putting habitats and human life at risk.

What can be done?

The **most cost-effective measure to address the impacts from IAS is to prevent their introduction**. This can be achieved by establishing effective and well-resourced biosecurity measures to manage priority pathways of introduction, supported by early warning systems and rapid eradication capacity. Control, containment and – where feasible – eradication, also need to be undertaken to mitigate the impacts from established IAS, including those whose impacts are likely to increase due to climate change.

It is essential that a cross-sectoral approach is taken in IAS prevention and management measures. This needs to include the environment, human health, agriculture, fisheries, customs and transport government departments, along with key private sector bodies and civil society.

Governments, donors and agencies that fund and implement projects, including projects supporting the SDGs, must ensure that current and potential impacts of IAS are understood so that relevant prevention and management measures can be incorporated into projects.

<p>© Goergen IITA</p> 	<p>1 NO POVERTY</p>  <p>2 ZERO HUNGER</p>  <p>1. No poverty 2. Zero hunger</p> <p>Fall armyworm <i>Spodoptera frugiperda</i>, is causing severe yield losses of maize across Africa impacting smallholder farms</p>
<p>© AFPMB</p> 	<p>3 GOOD HEALTH AND WELL-BEING</p>  <p>3. Good health and well-being</p> <p>Tiger mosquito <i>Aedes albopictus</i>, is a vector for human diseases such as dengue, chikungunya virus, and dirofilaria</p>
<p>© Ansgar Gruber</p> 	<p>6 CLEAN WATER AND SANITATION</p>  <p>6. Clean water</p> <p>Freshwater crayfish negatively impact water quality through sediment disturbance and aquatic plant removal</p>
<p>© Kent MacElwee</p> 	<p>8 DECENT WORK AND ECONOMIC GROWTH</p>  <p>8. Decent work and economic growth</p> <p>Water hyacinth <i>Eichhornia crassipes</i>, impedes navigation, halts fishing, and clogs irrigation channel</p>
<p>© Darrigran G.</p> 	<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>  <p>9. Industry, innovation and infrastructure</p> <p>Bivalves and other biofouling organisms are impacting infrastructure such as water treatment and power generation plants</p>
<p>© John Mauremootoo</p> 	<p>10 REDUCED INEQUALITIES</p>  <p>10. Reduced inequalities</p> <p>Mesquite <i>Prosopis</i>, thickets block access to grazing areas for livestock threatening pastoralist communities</p>
<p>© Greg Schechter</p> 	<p>13 CLIMATE ACTION</p>  <p>13. Climate action</p> <p>Coypu <i>Myocastor coypus</i>, can undermine the efficacy of wetlands reducing their resilience to climate change</p>
<p>© Brian Gratwick</p> 	<p>14 LIFE BELOW WATER</p>  <p>14. Life below water</p> <p>Lion fish <i>Pterois</i>, predate upon coral reef fish species and impacts the commercial and recreational fisheries that depend on them</p>
<p>© Pavel Kirillov</p> 	<p>15 LIFE ON LAND</p>  <p>15. Life on land</p> <p>Brown tree snake <i>Boiga irregularis</i>, has led to the extinction of many birds and reptile species on the island of Guam</p>

Examples of invasive alien species that can undermine progress towards achieving sustainable development © IUCN

Where can I get more information?

- IUCN invasive species work
- iucn.org/theme/species/our-work/invasive-species
- IUCN SSC Invasive Species Specialist Group
- issg.org
- Environmental Impact Classification of Alien Taxa
- iucn.org/eicat
- IUCN ISSG invasive species databases
- iucngisd.org and griis.org
- Honolulu Challenge on Invasive Alien Species
- iucn.org/honolulu-challenge