

# Banko Janakari

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## **Environmental conundrum: urgency of managing invasive alien species**

Plants, animals and other organisms have evolved and sustained in a specific geographical region for millions of years. Species' ability to move from one geographical region to another has largely been limited by natural barriers, such as ocean, mountain and deserts. Species' natural barriers of dispersal have, however, been breached by human mobility. Human mobility has increased tremendously following the discovery of America and advancement of transport infrastructures as well as expanding network of trade and travel globally. When humans move, they do not move alone; they carry seeds, plant parts, animals, and microorganisms along with them, intentionally or accidentally. Many species introduced to new localities through human activities do not regenerate naturally while others do, and produce self-sustaining populations in a completely new environment. Globally, 37000 species, shifted outside their native range by humans, have established their self-sustaining populations in the introduced regions. Some of such established species could be hostile to the native species and ecosystem. Such species of plants, animals and microorganisms are referred to as Invasive Alien Species (IAS). Over 3500 species are known to have negative impacts on native species, environment and human welfare, and have been, therefore, categorized as IAS. Expanding trade and travel through extensive transport networks have facilitated the unchecked introductions and rapid spread of IAS at local, regional, and global-levels. An analysis by Philip Hulme in 2009 has shown that the number of IAS have been rapidly increasing since the beginning of the industrial revolution while it was very low prior to that. IAS are projected to expand further with global climate change, increased global trade and movement of people and commodities.

IAS are among the major threats to biodiversity, and can cause irreversible damage to native species, ecosystem and nature's contribution to people. An assessment report published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has attributed IAS as a major cause of recent species extinction with their higher impacts on oceanic and small islands. According to the report, invasive species are solely responsible for the extinction of 16% of animal and plant species, globally. Biological invasion has also reduced uniqueness of the continents in terms of the species they have, a phenomenon known as biotic homogenization. Invasive species cause tremendous economic loss annually which constitutes direct damage (e.g., crop loss and reduced nature's contribution to people) as well as management cost (e.g., expenses associated with prevention and control including biological control program). According to the IPBES Report, a staggering cost of IAS to be over US \$ 432 billion globally in 2019, which has been predicted to increase in the future.

In Nepal, a total of 227 species of plants have already been reported as naturalized or established alien species. The number of the invasive alien plant species (IAPS) has been reported to be increasing over the years in the nation. In 2005, the IUCN reported a total of 21 species of IAPS, of which six were flagged out as high-risk-posing species. Bharat Babu Shrestha, a professor of Botany at Tribhuvan

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University, who has been extensively working on IAPS for almost two decades, has updated the number of invasive species to thirty. Most of the IAPS found in Nepal are of South American origin. Among the thirty species, five species, namely, Seto Banmara (*Chromolaena odorata*), Lahare Banmara (*Mikania micrantha*), Kande Banmara (*Lantana camara*), Singapore Daisy (*Sphagneticola trilobata*), and Jalkumbhi (*Pontederia crassipes*) are among '100 of the world's worst invasive species'. In addition, Ipil Ipil (*Leucaena leucocephala*) and Pate Salla (*Pinus patula*), for example, have risk to be invasive in Nepal. Botanical explorations have clearly shown that invasive species are spreading fast and several of these species are moving both west and northwards.

IAPS have already affected forests, wetlands, pastures, crop fields and other open areas mainly in the tropical and subtropical regions of Nepal. Additionally, IAPS have suppressed forest regeneration, degraded habitat quality for wildlife, increased risk in forest fire, reduced availability & quality of forest environmental services. Furthermore, IAPS are management burden in wetlands. An assessment of invasion threat in agriculture across 124 countries has ranked Nepal as the third most threatened countries. This issue must be taken as a serious warning as invasion risk in agriculture can have widespread impacts ranging from production cost to food security. Acknowledging the threat posed by IAPS, Nepal's National Biodiversity Strategy and Action Plan (NBSAP, 2014–2020) has set forward strategies for managing these species. However, the progress in their management is rather slow with most of the targets including policy responses remain unachieved by the end of 2020. Governments, communities and other stakeholders have been undertaking field-level actions to control IAPS, mainly a few burdensome species in forests and wetlands. Local communities' have implemented a range of methods- from hand pulling to use of herbicides, to contain these weeds.

Despite efforts and investments over time, results regarding their management are not satisfactory and enduring, especially in the case of *Lantana* and *Mikania* species. Failure to achieve desired outcome in IAPS management can be attributed to the lack of long-term perspectives in management and uninformed management decision. Every year, one or more established IAS have been reported. Recently, a new IAS, namely *Mimosa diplotricha* has been reported in the eastern Terai region of Nepal. Preliminary report shows that the species has already caused death of around 1000 goats, cows and buffalos in Jhapa and Morang districts. As the species has limited distribution, there is a window of opportunity to contain the weed in the eastern Nepal before it becomes widespread and causes big damage. The *Mimosa* case also provides an opportunity to the Nepal Government to demonstrate its environmental commitment through early detection and rapid response against IAS, and their management within the broader goal of forest landscape restoration is very relevant and important in the context of UN Decade on Ecosystem Restoration. Most importantly, IAS management will largely contribute towards UN Sustainable Development Goals (Target-15.8) and Global Biodiversity Framework Target-6.

Management of IAS is easier when they are identified and responded at the early stage of invasion. Failing to capitalize the window of opportunity, which may be short, increases management burden as well as impacts over time. Ultimate management of invasive species occurs at local level. Therefore, species and ecosystem specific action plans framed with long-term perspectives are required for efficient management of invasive species. Local actions and successful practices in turn should be backed by national policies and programs including a strong regulation of quarantine for incoming propagules.

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