ICIMOD

PROCEEDINGS OF THE WORKSHOP ON

Invasive alien species in the Hindu Kush Himalaya

Setting management targets for the next decade

29–30 September 2021

SECTION 1

Background and context

Mountains are often viewed as resistant to biological invasions, mainly because of low anthropogenic disturbances, low propagule pressure of pre-adapted species, and a steep elevation gradient. However, rapid economic development and land use change can increase propagule pressure and habitat disturbances in the mountains. Climate change and its impacts can further increase future invasion risks in mountain ecosystems. Rapidly accelerating international trade and travel through various means of modern transportation have facilitated the rapid spread of invasive alien species (IAS). About 50% of invasive plants in the Hindu Kush Himalaya (HKH) region have been introduced unintentionally.

The Convention on Biological Diversity (CBD) had hoped that "… by 2020 IAS and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment." Over the past decades, significant progress has been made in IAS research, particularly with respect to developing tools for assessing the environmental and socioeconomic impacts of IAS and creating a global database on the distribution of IAS, but there are substantial gaps in our understanding of the dynamics and implications of biological invasions in the HKH region.

The first draft of the Post-2020 Global Biodiversity Framework has set Target 6 on IAS. According to this target, by 2030 pathways for the introduction of IAS will be identified and prioritized, preventing or reducing their rate of introduction and establishment by at least 50%, and actions will be undertaken to control or eradicate IAS to eliminate or reduce their impacts, with a focus on priority species and sites.

SECTION 2

About the webinar

IAS are one of the major drivers of biodiversity loss across the globe. They affect natural ecosystems, agriculture, human health, and livelihoods. Invasion rate in mountain ecosystems in the HKH is likely to increase in the future, leading to greater biodiversity loss. Aichi Biodiversity Target 9 of the CBD stresses the need for IAS management. However, a review of Aichi Targets for the HKH reveals that little progress has been made to achieve this particular target.

The International Centre for Integrated Mountain Development (ICIMOD) organized this webinar to share the current state of knowledge on IAS in the HKH and to present global perspectives on managing invasive species. The webinar also explored the priorities for the Post-2020 Global Biodiversity Framework on IAS, contribution to CBD CoP15 by highlighting issues and challenges related to IAS in mountain regions, particularly in the HKH, and suggesting priority actions for effective management of IAS.

SECTION 3

Objectives of the webinar

- Share knowledge on the current status of IAS in the HKH region
- Share global experiences on research and good practices in IAS management
- Discuss priority actions and give key recommendations for the Post-2020 Global Biodiversity Framework on IAS

The webinar was moderated by **Tashi Dorji**, Programme Coordinator, Kanchenjunga Landscape Conservation and Development Initiative. More than 180 people registered for the event and nearly 65 people from the HKH member countries and Germany, Sweden, Hungary, Peru attended the webinar. The first day of the webinar was focused on stock taking of the status of invasive alien species and good practices in managing IAS in the HKH member countries. The second day was intended to yield more insights about research and good practices in IAS management, identify priority actions, and make recommendations for the Post-2020 Global Biodiversity Framework through technical presentations and a panel discussion.

SECTION 4

Day 1

Opening remarks

Izabella Koziell, Deputy Director General, ICIMOD, mentioned that this was the first regional webinar organized by ICIMOD on IAS. It was a timely event where participants would highlight the challenges related to IAS in the mountain regions, particularly the HKH, and discuss priority actions for managing IAS in the Post-2020 Global Biodiversity Framework. She expressed hope that the webinar would provide an opportunity to exchange ideas and tools for IAS management, and build partnerships to work on Post-2020 Global Biodiversity Framework on invasive species.

Technical session

Srijana Joshi, Ecosystem Specialist, ICIMOD, said that the number of scientific publications on the HKH has increased over time, but studies on geographic and thematic coverage of alien plant invasion remain scarce, with hardly any studies reported from three RMCs – Afghanistan, Bangladesh, and Myanmar. Most research is focused on distribution and spread of invasive species, whereas other thematic topics such as control and management and impact are less studied in the region. There is very limited research collaboration among HKH member countries on invasive species. To fill the data gap, collaborative research on invasive species should be carried out at the local, national, and regional level. To devise a policy for managing such species, it is important to determine the number of alien species and prepare a list of naturalized and invasive species in each country/landscape for their long-term management. Studies need to be conducted to identify dispersal pathways and vectors involved in the introduction and spread of IAS. Impact assessments of IAS on biodiversity, livelihoods, and economy need to be conducted regularly using standardized methods.

Dorjee, Weed Management Programme, National Plant Protection Centre, Department of Agriculture, Bhutan, delivered a presentation on the origin of invasive species and their pathways of introduction. Dorjee informed the participants that there are 964 alien plant species found in Bhutan, out of which 101 species are reported to be invasive and 90% of the introduction pathways are intentional. The challenge of intentional introduction of IAS can be addressed through awareness raising. Dorjee said that there has been no comprehensive assessment of the impact of IAS on Bhutan's ecosystems, though there has been some progress with regard to their management, as Bhutan has developed tools and a framework for assessing weed risk and hybrid risk for cross-border management. He urged the government to implement these tools for informed decision making.

Zheng Yulong, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences (CAS), Kunming, China, delivered a presentation on the status of IAS in China. He said that 660 IAS have been reported in China and about 49% of these species have been introduced intentionally. Yulong added that losses associated with IAS in China amount to approximately $18.9 billion/year. These economic damages can help policy makers gauge the impact of IAS. He also highlighted the 4E programme of China which focuses on early warning and prevention, early monitoring and rapid detection, early eradication and blocking, and the overall management of IAS, and stressed the need for more research and financial resources for the management of IAS.

Anzar Khuroo, Senior Assistant Professor, Department of Botany, University of Kashmir, India, briefed the participants on the status of invasive alien plants in the Indian Himalayan region. There are 773 alien plant species in the Indian Himalaya, and majority of them were brought from South America. He said there are serious gaps in landscape-level data on diversity and distribution, and ecological and economic impacts of IAS, and he highlighted the need for transboundary IAS management, and effective pre-border and post-border quarantine for Invasive Alien Plant Species (IAPS).

Bharat Babu Shrestha, Associate Professor of Botany, Tribhuvan University, Nepal, gave a presentation on IAS in Nepal, with a focus on diversity, impacts, and management options. He said that 29 IAPS have been reported so far in Nepal, with information lacking on invasive alien animal species. The pathway of invasion is unknown for many species; however the major drivers of invasion are deforestation, agricultural land abandonment, and infrastructure development. Shrestha said there has been limited research on the impact and management of IAS, and called for more research and awareness raising on the issue.

Asad Shabbir, Weed Ecologist, University of Sydney, gave a presentation on the impacts of IAS in Pakistan and options for managing them. There are 29 IAPS in Pakistan and their major pathway of introduction is mostly intentional for ornamental plants, horticulture, and agriculture. Shabbir highlighted several problems such as the huge knowledge gap on the impacts of IAS; the lack of national policy/ programme related to IAS in Pakistan; the limited understanding of invasion pathways and impacts; low awareness of IAS; and the absence of strong legislation for effective IAS management.

SECTION 5

Day 2

Opening remarks

Pema Gyamtsho, Director General, ICIMOD, mentioned that IAS are considered one of the major drivers of biodiversity loss and species extinction. Globally, in the last decade, progress has been made in identifying and prioritizing IAS in terms of the risks they pose. However, there is no evidence that new introductions of IAS are being slowed down. He said that the webinar would allow the participants to share research findings and good practices in managing invasive alien species, establish a regional IAS network, discuss priority actions, make key recommendations for the Post-2020 Global Biodiversity Framework on IAS, and also to bring the issue of IAS in mountain ecosystems to the world's attention.

Technical session

David R. Clements, Professor of Biology, Trinity Western University, Canada, said that IAS are growing all over the world. The spread of IAS is compounded by climate change and globalization. Clements informed the participants that the global mean annual cost of biological invasion reached $162.7 billion by 2017. He explained that plant invasion often takes place in three phases: lag

phase, exponential growth, and establishment and the drivers of plant invasion include ecosystem resistance, invader fitness, and climate dynamics. Clements was of the view that the linkages between climate change and invasive species are becoming clearer, including in the mountainous regions of the world. He suggested improvements in technology to slow down the impacts of invasive species. Species in remote areas are very difficult to control. An innovative technology used in Hawaii involves shooting herbicide capsules from helicopters using modified paintball guns, but such technologies require a lot of resources and government and regional support. Biosecurity is also key to controlling invasion.

Agustina Barros from the National Scientific and Technical Research Council of Argentina highlighted the importance of research on plant invasion in the mountains. Climate change, increased land use change, and improved transportation and road access have increased the spread of IAS, though the spread is relatively low in the mountains. The Mountain Invasion Research Network (MIREN) is a collaborative initiative that aims to understand the effects of social, economic, and environmental changes on species distribution and biodiversity in the mountain regions. MIREN includes local case studies from 20 mountain regions, integrated with international networks. It is funded through local and regional grants and focuses on empirical research.

Plenary session

The plenary session was mostly focused on delivering key messages regarding IAS in the HKH to CBD COP15. The session was moderated by Tashi Dorji.

Panelists:

- **Dorjee**, Weed Management Programme at the National Plant Protection Centre, Department of Agriculture, Bhutan
- **Zheng Yulong**, Xishuangbanna Tropical Botanical Garden, CAS, Kunming, China
- **Anzar Khuroo**, Senior Assistant Professor, Department of Botany, University of Kashmir, India
- **Bharat Babu Shrestha**, Associate Professor of Botany, Tribhuvan University, Nepal
- **Asad Shabbir**, weed ecologist, Pakistan
- **David R. Clements**, Professor of Biology, Trinity Western University, Canada
- **Agustina Barros**, National Scientific and Technical Research Council, Argentina
- **Sunita Ulak**, Under Secretary (Tech), Forest Research and Training Center, Ministry of Forests and Environment, Government of Nepal

Key recommendations for the Post-2020 Global Biodiversity Framework

Mountain ecosystems should be included as priority sites for Target 6. This is in view of the increased vulnerability of mountains to plant invasions due to climate change, increased land use, and transportation. Human disturbances in the mountains, such as roads and trails act as important dispersal vectors for non-native plants. They are also important disturbance factors promoting non-native plant establishment and success in high elevation areas. These high elevation areas, including alpine sites, harbor many native species of high conservation value, including endemic plants. Therefore, the upward shift of non-native species can have a direct impact on mountain plant biodiversity. Early detection of IAS, especially in higher elevations, should be one of the targets. More research on IAS distribution is needed to develop effective interventions.

We need to set targets for managing IAS. Areas of ecological importance, such as protected areas, should be prioritized. Transboundary landscapes are more susceptible to biological invasions, and international collaboration is required to address this.

There is a need to generate quality data to better manage IAS. Many available tools and standard protocols can help generate good quality information. There is a need to build networks across HKH countries to promote regional collaboration for IAS management.

Intentional and accidental pathways should be known for IAS management. Economic impacts of IAS should be assessed. As the cost of managing IAS depends on the stage of invasion, early detection and rapid response should be a priority, along with the use of cost-effective methods.

It is important to formulate national strategies for IAS management and develop a mechanism for policy implementation. Strategies to address global environmental changes such as climate

change should be integrated with IAS management. Policy and programmes dealing with these problems should also consider and integrate IAS management.

The management of IAS through one common method is very difficult. It is important to have an integrated approach to manage the sites that are most susceptible to IAS.

Awareness about IAS is very low in developing countries. One reason is that the issue is not well understood and is not considered a problem. To raise awareness, we need to highlight the economic losses caused by IAS in monetary terms. There is also a need to implement short-to medium-term actions to increase capacity for IAS management and perform risk analysis such as cost-benefit analysis for IAS.

It is necessary to strengthen the research capacity of academic institutions and organizations by providing funds and other facilities.

SECTION 5

Conclusion and a way forward

Sunita Chaudhary, Ecosystem Services Specialist

IAS have not received due attention from the governments of HKH countries. There is a need to raise awareness about threats posed by invasive species to different sectors. For this, credible information should be made readily accessible to the public and policy makers. There is a need to engage citizen science for monitoring and surveillance of invasive species.

ICIMOD being an intergovernmental knowledge centre can facilitate dialogues and contribute towards science-policy-and-practice at the regional, national, and local level. There is limited collaboration among HKH countries on IAS research.

Collaboration can be initiated with a plan to come up with a compendium of best practices for the management of IAS from the HKH region and mountains all around the world.

Draft communication notes on the key recommendations to the Post-2020 Global Biodiversity Framework before CBD COP15.

Follow up with Regional Member Countries to form an invasive species network across HKH member countries to promote regional collaboration for IAS management.

SECTION 6

Closing remarks

Buddhi Sagar Poudel, DG, Department of Plant Resources, Nepal

In his closing remarks, Buddhi Sagar Poudel said that the webinar had brought together experts from the Regional Member Countries of ICIMOD to share the current state of knowledge on IAS in the HKH region, and also international experts to share global experiences related to research and good practices in managing IAS. Poudel stressed the need to prioritize species and ecosystems and to collaborate and coordinate with all stakeholders. The government of Nepal is collaborating with institutions like ICIMOD to address the threat to biodiversity. He said the two-day webinar was a timely and successful event that met all its objectives, and expressed hope that the key recommendations would be translated into action.

The event ended with a vote of thanks by **Syed M Abubakar**, Knowledge Management Communication Officer, ICIMOD.

Additional event information and materials are available at:
https://www.icimod.org/event/invasive-alien-species-in-the-hindu-kush-himalaya-setting-management-targets-for-the-next-decade/

Proceedings contributors: Srijana Joshi, Nakul Chettri, Syed Muhammad Abubakar, Tashi Dorji, Sunita Chaudhary, Basant Pant, Lily Shrestha
Edited and laid out by the Production Team, Knowledge Management and Communication Unit, ICIMOD

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International Centre for Integrated Mountain Development
GPO Box 3226, Kathmandu, Nepal
T +977 1 5275222 | **E** info@icimod.org | **www.icimod.org**