

CABI

Tackling invasive alien species to reduce biodiversity losses and improve livelihoods



CABI is an intergovernmental not-for-profit organization established by a United Nations treaty-level agreement between 48 member countries. Our mission is to improve people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment.

CABI is developing a major new global programme to reduce biodiversity losses and protect vulnerable rural communities affected by invasive alien species.

IAS are of global concern, threatening biodiversity and the livelihoods of millions of poor rural communities. CABI has been addressing IAS and providing solutions since 1910 and our scientists have >700 years' collective experience in IAS prevention, early detection and control. CABI works with

countries, enabling them to achieve targets under the CBD. Since 2011, CABI has worked on IAS projects in 39 countries, and trained representatives from a further 45 countries. We advise governments and inform IAS policies and strategies. CABI is also working to create early warning systems and to mitigate impacts of IAS using biocontrol and other sustainable methods.

Acronyms

Project COSL	Controlling <i>Opuntia stricta</i> in Laikipia, Kenya
Project FORIS	Removing Barriers to Invasive Species Management in Production and Protection Forests in SE Asia (FORIS)
Project IPSN	International Plant Sentinel Network (IPSN)
Project ISC	Invasive Species Compendium (ISC)
Project ISC-ACP	ISC - maximising use in ACP countries
Project ISC-ICE	ISC and the US Invasives Causing Extinction Program
Project ISLT	Invasive Species - the livelihoods threat
Project MIPHA	Managing invasive plants in the Horn of Africa
Project MLIEA	Measuring the livelihood impacts of invasive alien species in East Africa
Project MTIASIC	Mitigating the Threats of Invasive Alien Species in the Insular Caribbean
Project PERMIT	Pathway Evaluation and Pest Risk Management In Transport
Project RFRICI	Restoring the flora of Robinson Crusoe Island
Project SR-ICE	Systematic review: The impact of invasive species on endangered species
Project TKIPL	Tools for invasive plants in East Africa
Project TKIPL	Tools for invasive plants in Laikipia, Kenya
Project VIMPTT	Developing Vegetable IPM using a Local Farmer Context: Trinidad & Tobago
Project WWEA	Woody invasive alien species in East Africa
ACP	Africa, Caribbean and Pacific
BGCI	Botanical Gardens Conservation International
CBD	Convention on Biological Diversity
GEF	Global Environment Facility
IAS	Invasive alien species
RA	Risk Assessment
SE Asia	South East Asia
UNEP	United Nations Environment Programme

C

Project TKIPL: Toolkits with identification guides and information on management options were developed to address threats posed by the spread of invasive alien plants to biodiversity resources in Laikipia County, Kenya

Project TKIPL: Surveying large areas for invasive plants, collating data for national and global datasets and creating identification and management toolkits to improve the implementation by eastern African national authorities to control invasives threatening biodiversity and livelihoods

Project ISC-ICE: Collating data on invasive species affecting threatened species in the USA

Project SR-ICE: A systematic review found broad scientific consensus that invasive species play a devastating role in driving species extinctions, found gaps in research and that the most common mechanisms of impact reported were predation, competition for resources and herbivory



Data on invasive species causing extinction

Invasive species, along with habitat loss, overexploitation and pollution are a major cause of species extinction. Currently there is little easily accessible knowledge on the role of invasive species and their management in order to prevent or slow the decline of species. Taking the USA as an example, little is known about how species that are listed, or identified as candidates for listing as endangered species under the Endangered Species Act (ESA), are affected by invasive species.

Working with the US Department of Agriculture's Animal and Plant Health Inspection Service (USDA APHIS) and expert contributors from around the globe, our specialist content editors have so far produced and published over 300 new datasets in the ISC on invasive species that are detrimental to threatened species in the USA. Most of these invasive species are plants but arthropods make up the second largest group. We have also included a significant number of freshwater fishes, birds, mammals, other vertebrates and a number of other groups are represented such as molluscs, pathogens, algae, etc.

The team has indexed and uploaded more than 200 US Fish and Wildlife Service Recovery Plans to the Compendium, which can be found using the ISC's basic search interface or by clicking on links from related invasive species datasets.

(Image: *Juncus effusus*, invasive in Hawaii. ©Forest & Kim Starr-2009 - CC BY 3.0)



A

Project WWEA: Raising awareness of the effects on biodiversity and livelihoods of invasive plants in Ethiopia, Kenya and Tanzania

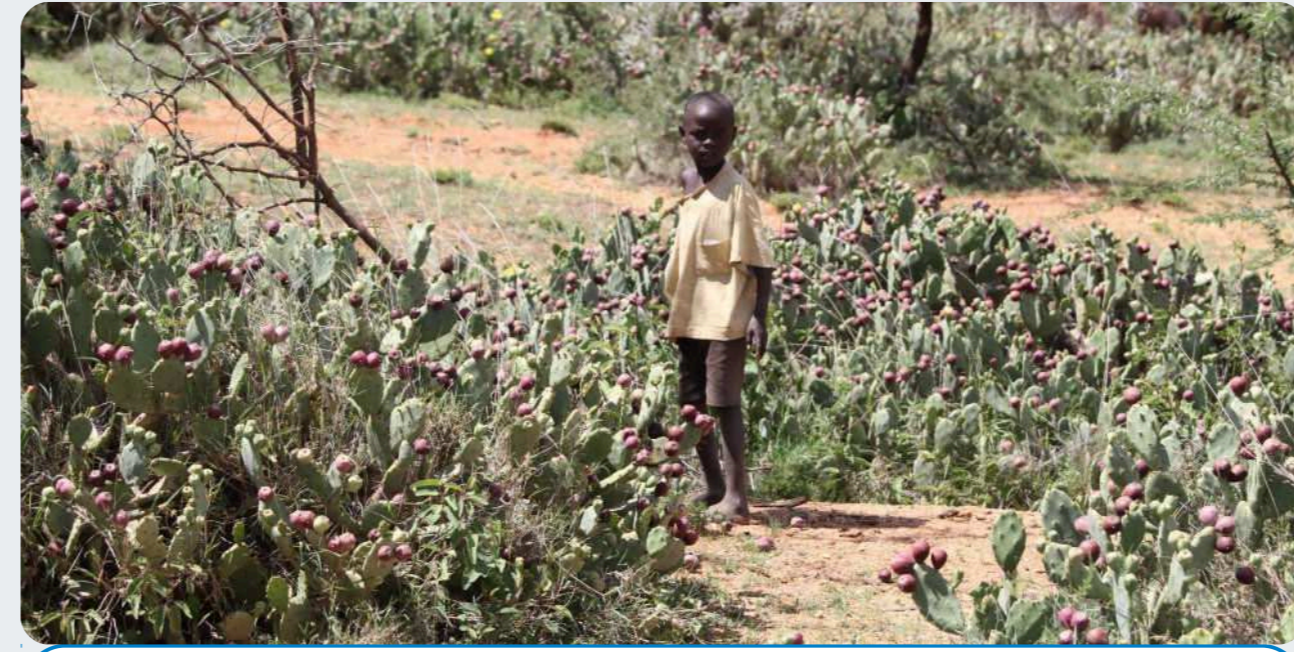
Project FORIS: Documentary on *Acacia nilotica* in Baluran national park (Indonesia) and impact on biodiversity: >25 TV channels, watched by >250 million people in >15 countries

Tackling the impact of invasive species on biodiversity and livelihoods

Project FORIS: National Steering Committees on IAS set up in Cambodia, Indonesia, Philippines and Vietnam

Project WWEA: Influencing policy for sustainable land management, mitigating effects of woody invasives in Ethiopia, Kenya and Tanzania

Project MTIASIC: Policies, strategies, best practices for invasives embedded in Bahamas, Dominican Republic, Jamaica, St. Lucia and Trinidad & Tobago



Campaigning to highlight and address the impact of invasive species on biodiversity and livelihoods

If left unchecked, invasive species can threaten rural communities whose livelihoods depend on agriculture and the health of biodiverse ecosystems. This is often compounded by a lack of awareness of the scale and impact of the problem by national and regional partners, a lack of collaboration between key sectors of government and a lack of accessible information. CABI is therefore launching a major new programme to protect vulnerable rural communities in the fight against them.

Building on our 100-year track record in invasive species management, CABI will deliver a unique global programme to support 50 million vulnerable farming families impacted by species that are out of control, threatening their livelihoods and costing economies billions of dollars (estimated at >SUS 183 billion per annum in sub-Saharan Africa, South and South East Asia together). We will use an environmentally sustainable, regional cross-sectoral approach to achieve comprehensive management.

By using available scientifically proven solutions, the devastation caused by invasive species can be halted and even reversed. Incomes can be improved, crop yields increased and land can be reclaimed.

CABI will use its practical scientific expertise and coordinate global action. The programme is based on three stages: prevention, early detection/eradication and control/restoration. Together with its network of partners, CABI will bring together currently disconnected government ministries, NGOs, farmer groups, the private sector, public extension and research bodies across different regions to tackle the threats invasive species pose to livelihoods.



D

Project FORIS: Regional training workshops run in Cambodia, Indonesia, Philippines and Vietnam on forest restoration

Project MIPHA: Contributing to the IGAD Biodiversity Management Programme; identifying invasive plants between Somalia and northeastern Kenya, determining impacts

Project COSL: Biocontrol of *Opuntia stricta* in Laikipia County, Kenya

Project MLIEA: Addressing invasive alien plant threats to East Africa's biodiversity resources; filling knowledge gaps and developing toolkits

Project RFRICI: Conservation, propagation and re-establishment of native plants on Robinson Crusoe Island, Chile

Contributions to the Nagoya Protocol implementation



CABI works with member countries to comply with the Nagoya Protocol

CABI works to conserve and use genetic resources of plant, animal or microbial origin and associated data in many ways across the world. To ensure that our work complies with the CBD and the Nagoya Protocol, CABI has aligned its practices accordingly. We work with countries to engender trust, to facilitate science and to ensure that any benefits are shared. CABI complies with national legislation developed under a country's commitment to the CBD, for example, in the collection and inter-country movement of potential biological control agents.

The Nagoya Protocol is designed to strengthen the links between biological resources and their originating countries or communities. CABI is working with countries to put compliant best practice in place and making it work in a way that meets national legislation.



Globally, each country that is a signatory to the CBD and the Nagoya Protocol will need to implement its own protocols in order to comply. However, CABI is taking a lead and working with its member countries. CABI is bringing together relevant information that is not currently available elsewhere, producing guidelines and providing policy that engenders trust in using biological resources and negotiating appropriate and manageable agreements to ensure compliance.

B

Project COSL: Biocontrol of *Opuntia stricta* in Laikipia County, Kenya

Project TKIPL: Addressing invasive plant threats to East Africa's biodiversity

Project WWEA: Mitigating the effects of woody IAS in Ethiopia, Kenya and Tanzania

Project VIMPTT: Overcoming constraints to IPM in Trinidad & Tobago

Project FORIS: Pilot scale management systems against IAS in SE Asia

Developing biological control methods

Project ISC: >2k factsheets supporting RA and prioritizing of IAS and pathways

Project PERMIT: Enhanced pathway management for woody plants in Europe



Applying expertise in biocontrol to address invasive species threats and biodiversity conservation

Biological control is a safe, sustainable, effective and environmentally sound approach to the management of invasive species, and is an important tool in achieving the Aichi biodiversity targets. CABI has assisted national programmes to implement biological control of weeds, pests and plant diseases around the globe, using rigorous protocols abiding by international agreements, with many notable successes. Here are some examples of CABI's work:

- CABI identified and studied parasitoids that were highly successful in controlling the cassava and mango mealy bugs that were threatening the food security and livelihoods of millions of African farmers.
- CABI developed the fungal based 'Green Muscle' a targeted product to help prevent locusts from reaching plague proportions in Africa.
- CABI identified and safety tested a rust fungus that is successfully controlling the highly damaging rubbervine weed in Australia, which has a cost to benefit ratio of 1:108. Lessons learned are being applied in Brazil.
- In North America, leafy spurge control has been achieved using five flea beetles which were identified and tested by CABI scientists. This has resulted in an annual benefit of SUS 19.3 million.
- In Kenya, CABI partnered with local scientists to introduce a cochineal insect to help control the devastating invasion from the erect prickly pear.
- A growing number of South East Asian and Pacific countries are controlling the mikania weed with a rust fungus identified and safety tested by CABI. Evidence shows that this is having a significant impact.
- CABI is currently working with UK governmental organisations to implement the first weed biocontrol projects in Northern Europe, targeting Japanese knotweed, Himalayan balsam and others.



E

Project FORIS: With UNEP and partners, established National IAS Coordination Units, developed national invasive species strategies and action plans, IAS communication strategies, IAS training modules, developed and implemented IAS best management practices, etc.

Project ISC-ACP: In ACP regions, 177 stakeholders representing 59 countries trained in using the ISC

Project ISC: Authoritative data to support RA and prioritization of IAS and pathways collated and made available Open Access through the ISC. >700,000 users over the past year

Project IPSN: Leading botanical gardens and arboreta to information on invasives and their impacts on biodiversity; linking BGCI's PlantSearch database to the ISC

Project MLIEA: Our surveys and maps are informing stakeholders how impacts of IAS on biodiversity negatively affect livelihoods in poor rural communities in Zambia, Tanzania, Uganda and Kenya



Working in South East Asia to develop national and regional strategic plans and instruments to mitigate the effects of invasive species

IAS are threatening forest habitats in SE Asia. They also indirectly affect the livelihoods of millions of people who depend on forests for food, commodities and energy. Implemented by UNEP and funded by the GEF, CABI and partners, developed a project aimed at conserving globally important forests in the region. Countries in the region recognize the need to implement Article 8 (h) of the CBD to mitigate the threats posed by invasive alien species and this project aimed to enhance the capacity of Cambodia, Indonesia, Philippines and Vietnam to manage their IAS.

The project strengthened existing national frameworks to prevent and manage IAS. CABI achieved this by establishing national policy and institutional frameworks, developing mechanisms for risk analysis, early detection and rapid response mechanisms and cost-recovery systems to finance IAS management activities.

Building capacity within the region was an important component of the project so CABI worked with countries to increase regional co-operation and create awareness of the threats posed by IAS. We developed and implemented national training programmes, created a standardized communication strategy with national activities and regional targets and increased awareness on IAS at the regional and national levels. We created a documentary on *Acacia nilotica* in Baluran national park - supported by the Asian Broadcasting Union - which aired on over 25 TV channels, and was watched by over 250 million people in over 15 countries.

We also initiated pilot scale, model management programmes against target IAS such as gum arabic tree and merremia (Indonesia), catclaw mimosa (Cambodia), spiked pepper (Philippines) and giant sensitive plant (Vietnam).



AICHI BIODIVERSITY TARGETS STRATEGIC GOALS

A

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

- Target 1:** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
- Target 2:** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
- Target 3:** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.
- Target 4:** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

B

Reduce the direct pressures on biodiversity and promote sustainable use

- Target 5:** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
- Target 6:** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
- Target 7:** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
- Target 8:** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
- Target 9:** By 2020, invasive alien species 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.
- Target 10:** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

C

To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

- Target 11:** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
- Target 12:** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
- Target 13:** By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

D

Enhance the benefits to all from biodiversity and ecosystem services

- Target 14:** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
- Target 15:** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
- Target 16:** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

E

Enhance implementation through participatory planning, knowledge management and capacity building

- Target 17:** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
- Target 18:** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity, and their contribution to national legislation and relevant international obligations, are fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
- Target 19:** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
- Target 20:** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.



from the British people



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