



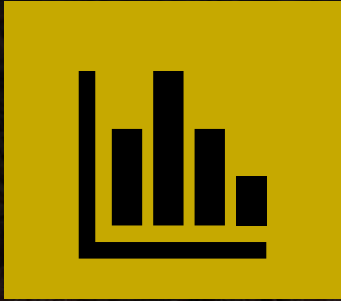
# Invasive Species (IS)

Regional Consultation, Trinidad & Tobago, September 2025

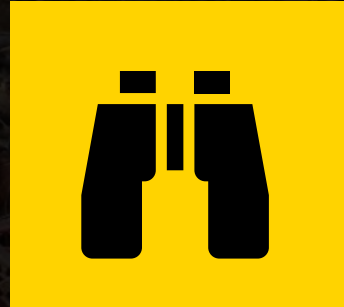


# CABI's Invasive Species work

Total of 80-85 different IS targeted



**Quantification  
of impacts and  
awareness  
raising**



**Prediction and  
prevention**



**Control**



**Policies,  
strategies and  
action plans**

# International Conventions

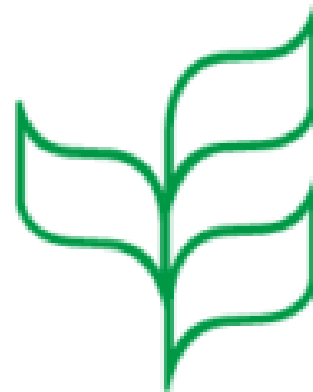


**185 contracting parties**

**International Plant Protection Convention**

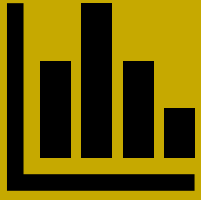
Protecting the world's plant resources from pests

**193 contracting parties**



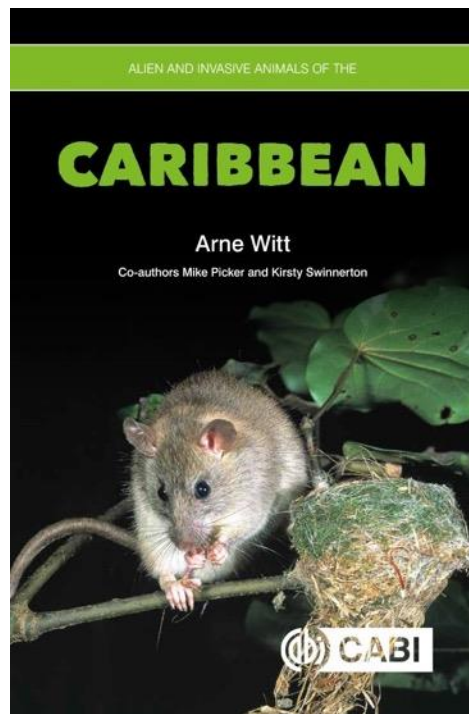
**Convention on  
Biological Diversity**





# Quantification of impacts and awareness raising

A literature review and online survey revealed that economic costs of invasive alien species to African crop and livestock production alone amounts to an estimated \$65 Bn USD annually



Eschen et al. *CABI Agric Biosci* (2021) 2:18  
<https://doi.org/10.1186/s43170-021-00038-7>

CABI Agriculture and Bioscience 

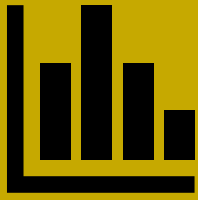
RESEARCH

Open Access



## Towards estimating the economic cost of invasive alien species to African crop and livestock production

René Eschen<sup>1\*</sup> , Tim Beale<sup>2</sup>, J. Miguel Bonnin<sup>3</sup>, Kate L. Constantine<sup>3</sup>, Solomon Duah<sup>4</sup>, Elizabeth A. Finch<sup>3</sup>, Fernadis Makale<sup>5</sup>, Winnie Nunda<sup>5</sup>, Adewale Ogunmodede<sup>3</sup>, Corin F. Pratt<sup>3</sup>, Emma Thompson<sup>3</sup>, Frances Williams<sup>5</sup>, Arne Witt<sup>5</sup> and Bryony Taylor<sup>3</sup>



# Impacts of Prosopis, an invasive tree in Eastern Africa



## Economic

invades grazing areas and crop land



## Environmental

reduces biodiversity and displaces native vegetation



## Social

Drives conflict between communities



## Ecosystem services

can consume equivalent of up to 50% of rainfall in invaded areas



## Human health

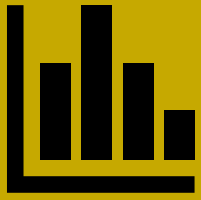
inflicts physical injuries and increases incidence of human disease vectors (e.g. malaria)



## Animal health

inflicts physical injuries through thorns and digestive problems

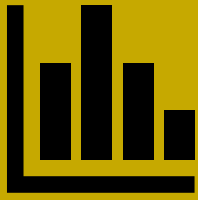




# Prosopis in Eastern Africa

“No grass grows underneath the *prosopis* so the livestock from the village are eating the *prosopis* instead. But its thorns are poisonous, and animals are dying. There is less land available for grazing which is fuelling conflict between families and driving people to move to escape the weed.”

Grace Kiseku, Assistant Village Chief, Lake Baringo, Kenya



# Quantification of impacts and awareness raising – Parthenium in Pakistan



Farmer training programmes reached **438 villages**



Weeding week reached **24 villages**



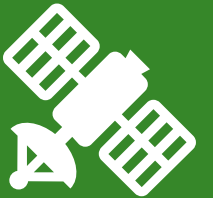
Documentary and Six Public Service Messages (PSMs) developed



PSMs were broadcasted on Radio FM 107 in Sheikhupura and FM 99.4 in Islamabad/Rawalpindi for one month



PSMs aired through National TV channels i.e. Geo News, Express News & ARY News during prime time



Documentary and PSMs were also broadcast through local cable network in Sheikhupura at seven locations



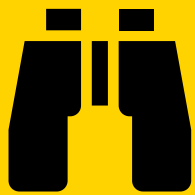


# Quantification of impacts and awareness raising – Parthenium in Pakistan

Estimated reach of over **2 million** people through all channels

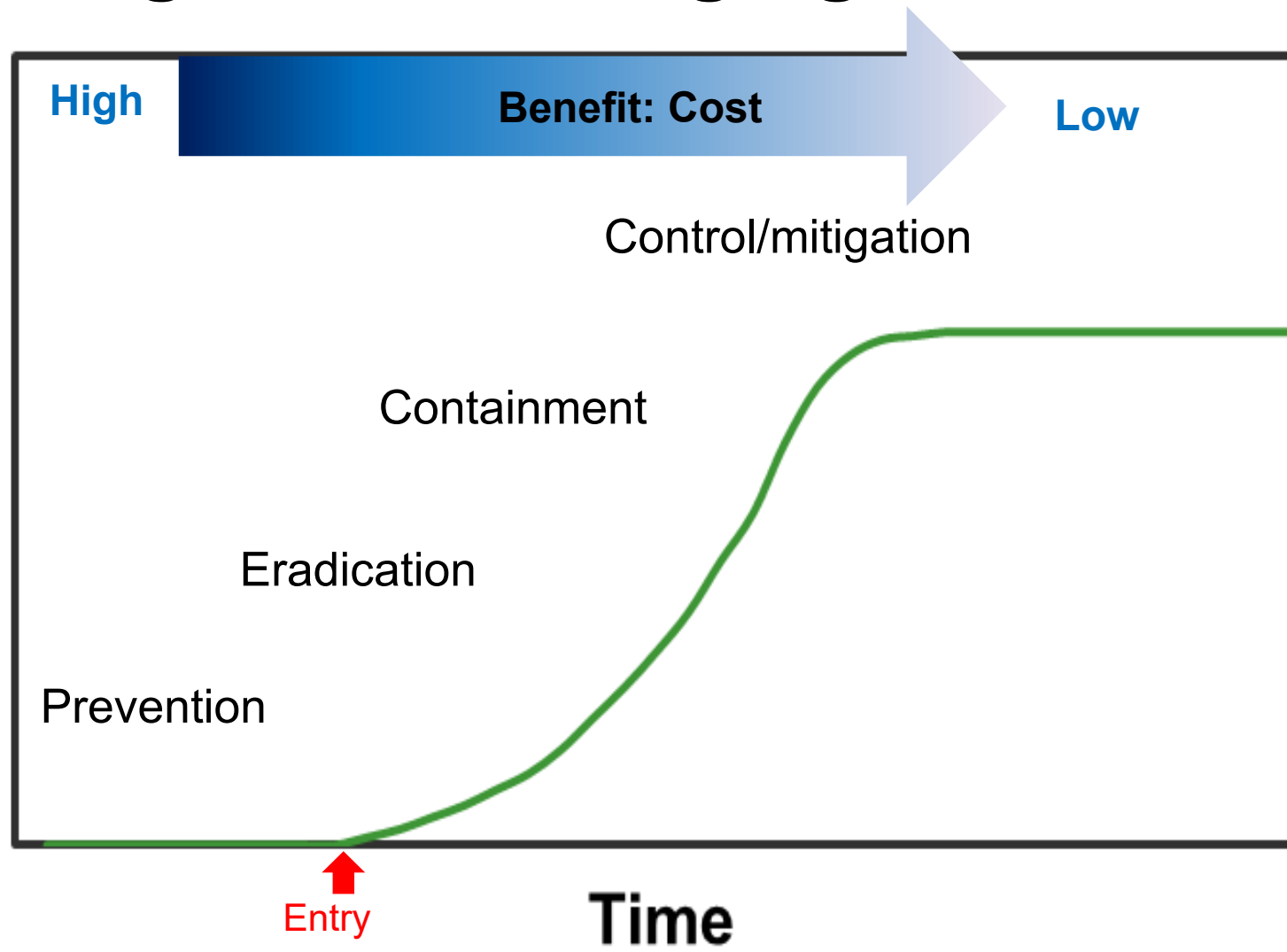






# Strategies for Managing Invasives

Abundance  
of invasive



Adapted from Western Australian Agriculture Authority (2015)



# Prediction and prevention

- **Horizon Scanning Tool** to identify potential invasive species that are not present in a country/region followed by rapid risk analysis
- So far HS workshops conducted in 9 countries, followed by a prioritization exercise
- Ideally subsequent establishment of Risk Registers to allow NPPOs to identify high risk pests for early detection and surveillance
- In Nepal, the exercise was also used to update the list of regulated pests
- Three regional workshops conducted, and one in planning together with CAHFSA

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**CABI** Horizon Scanning Tool  
Prioritizing invasive species threats

Area at risk: Pakistan Start Scan

☒ I am only interested in plant pests

Refine by: ?

Source areas Pathways Plant hosts Plant parts in trade Habitats Impact outcomes Organism type

Results: 1082 species found

Save and share scan

Current search:

Neighbouring Geographic Areas

Afghanistan China/Xinjiang India/Gujarat India/Jammu and Kashmir India/Punjab India/Rajasthan Iran

Pathways

Plant hosts

Plants parts in trade

Habitats

Impact outcomes

Organism type

Preferred scientific name	International common name	Organism type	View datasheet
Acalitus phloeocoptes	plum, blister mite	Invertebrates	Basic
Acanthoscelides obtectus	bean bruchid	Invertebrates	Enhanced
Acanthospermum hispidum	bristly starbur	Plants	Enhanced
Acarus siro	flour mite	Invertebrates	Enhanced
Aceria cajani	pigeonpea mite	Invertebrates	Enhanced
Aceria erineus		Invertebrates	Basic
Aceria ficus	fig blister mite	Invertebrates	Basic
Aceria guerreronis	coconut mite	Invertebrates	Enhanced

Search results from the CABI Horizon Scanning Tool <2022-08-21>

Area at risk: Pakistan ; Source Areas: Afghanistan, China, China/Xinjiang, India, India/Gujarat, India/Jammu and Kashmir, India/Punjab, India/Rajasthan, Iran ; Pathways: N/A (Including datasheets with)

Citation: <CABI, 2022. Horizon Scanning Tool. Crop Protection Compendium. Wallingford, UK: CAB International. <https://www.cabi.org/cpc>>

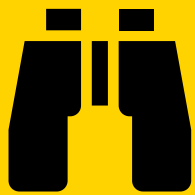
Search URL: <https://www.cabi.org/HorizonScanningTool/Country/SearchResult?guid=72318884-6704-4bdf-862a-eb9c1c340bcf>

For terms and conditions see: <https://www.cabi.org/terms-and-conditions/>

Preferred scientific name	International common name	Taxonomic	ISC cl	CPC col	Datashi	Domain	Kingdo	Phyluri	Class	Order	Family	Invasiv
Acanthoscoris scabrator	squash bug	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Arthropoc	Insecta	Hemipter	Coreidae			
Achaea janata	castor semiooper	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Arthropoc	Insecta	Lepidopte	Erebidae			
Achatina fulica	giant African land snail	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Mollusa	Gastropo	Stylomma	Achatinid	invasive		
Acherontia atropos	death's head hawkmoth	Invertebrates	Basic data	pest, natu	Eukaryota Metazoa	Arthropoc	Insecta	Lepidopte	Sphingidae			
Aculops lycopersici	tomato russet mite	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Arthropoc	Arachnida	Eriophydi	invasive			
Adelphocoris lineolatus	lucerne bug	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Arthropoc	Insecta	Hemipter	Miridae			
Agrotis lineatus	wireworm	Invertebrates	Full data	pest	Eukaryota Metazoa	Arthropoc	Insecta	Coleopte	Elateridae			
Aleurodicus dispersus	whitefly	Invertebrates	Full data	pest, natu	Eukaryota Metazoa	Arthropoc	Insecta	Hemipter	Aleurodid	invasive		

[www.cabi.org/HorizonScanningTool](https://www.cabi.org/HorizonScanningTool)





# Asian Citrus Psyllid and HLB – Ghana

Asian Citrus Psyllid (ACP) – *Diaphorina citri* an important pest of citrus; vector of the bacterial disease Huanglongbing (HLB)

2019-2020

Horizon scanning in Ghana identified ACP having a high-risk score

2022

Pest Risk Analysis done on both ACP and HLB

2023

Response plan developed for both to manage the risk

2024

Surveillance for HLB and ACP undertaken; detected ACP in southeastern Ghana, HLB absent

2025

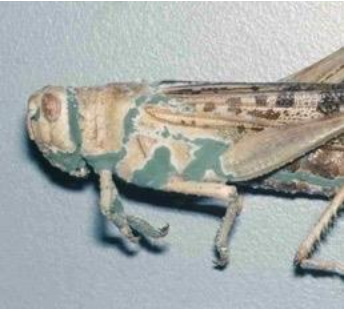
Inspection protocol developed for detection of HLB



# Control

CABI is a world leader in **biological control (BC)** solutions and also integrates BC with conventional control methods for **Integrated Pest Management**





- **Classical biological control**  
Currently targeting **56** invasive plants and insects
- **Augmentative biological control**  
Mass production and application of already present natural enemies
- **Biopesticides**  
Facilitating harmonization of regulations  
Research conducted by CABI, commercialization by private partner, e.g. Green Muscle for Desert Locust control

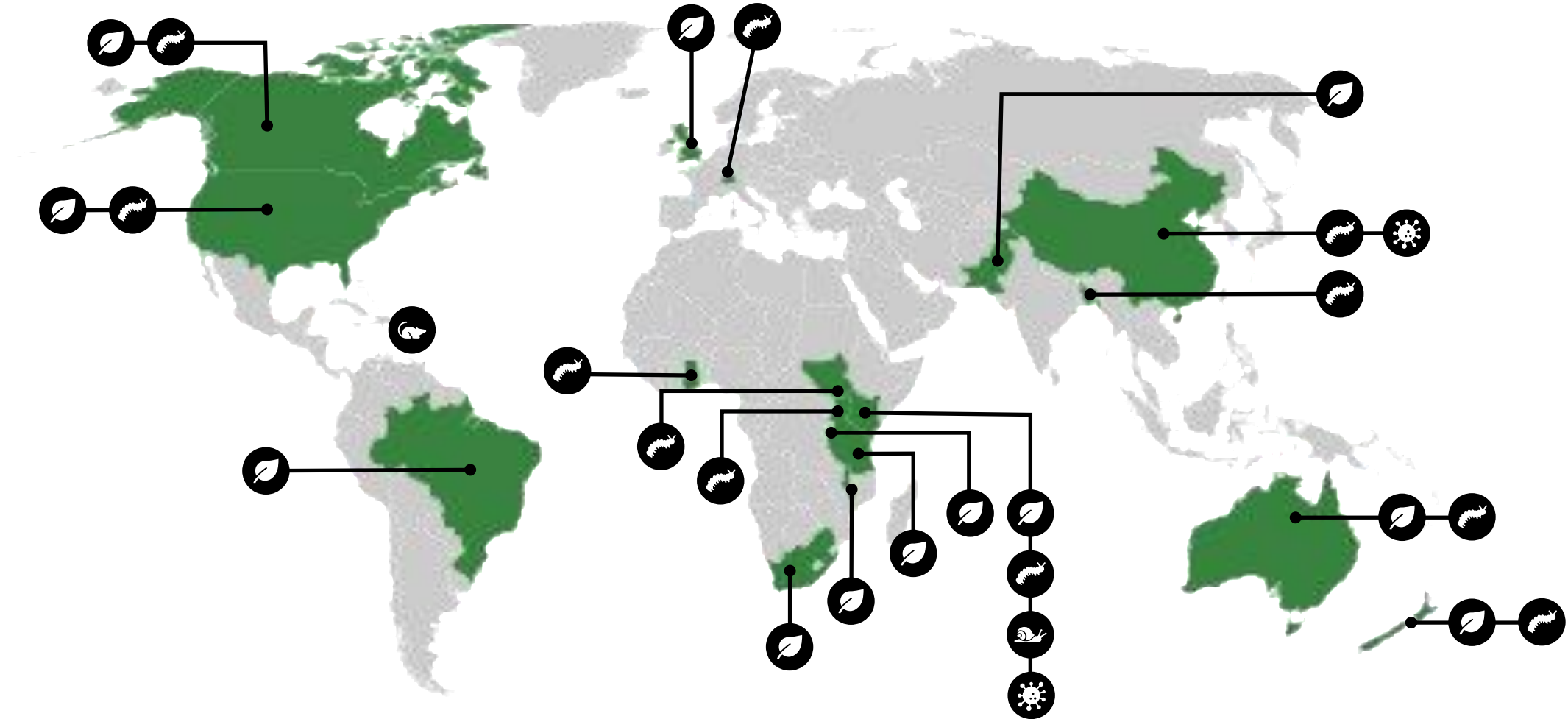






# Invasive Species Targets

-  Weed
-  Insect
-  Snail
-  Mammal
-  Pathogen





# Classical biological control of papaya mealybug (PMB) in East Africa

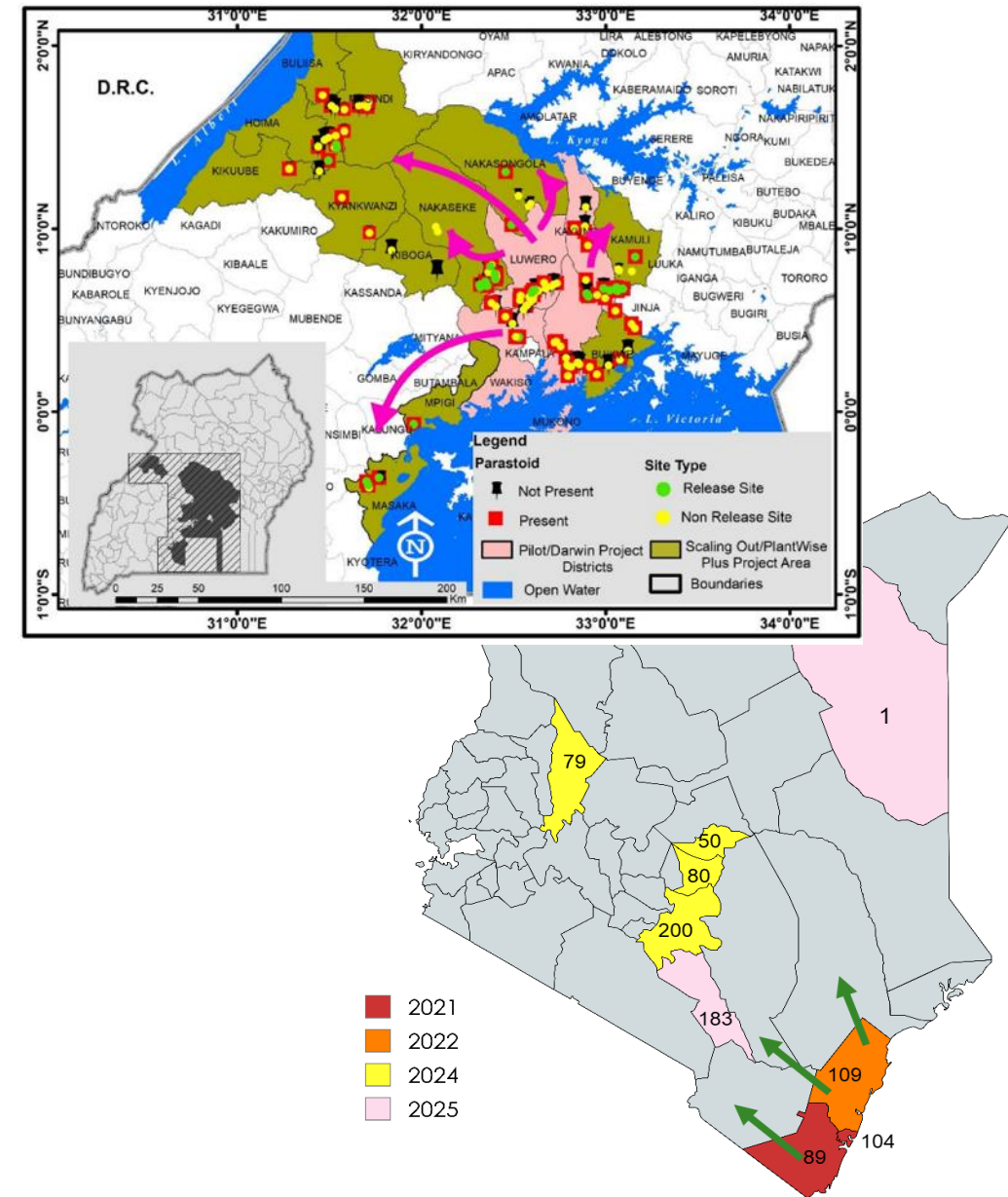
- PMB has been devastating papaya in East Africa since 2016
- Yield losses of 57%; economic losses at household level of **US\$ 30 million** annually.
- In collaboration with National partners, CABI developed a classical biocontrol strategy
- First wasps imported from Ghana to Kenya in 2020
- Since then more than 1 million parasitoid wasps' mass reared and released in Kenya, Uganda and South Sudan





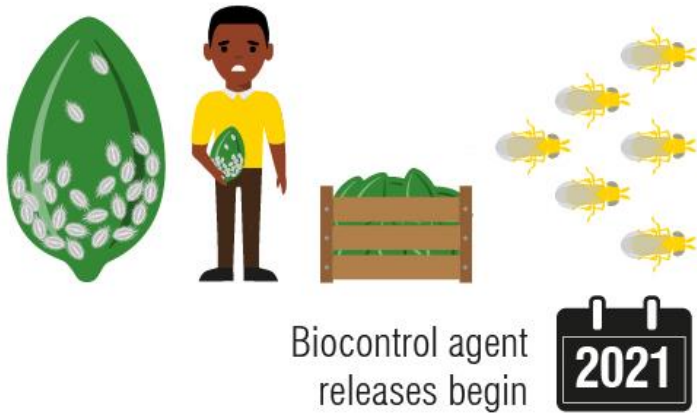
# Tracking the wasp's spread in East Africa

- 66% of sites at 100 km from nearest release site have the parasitoid
- Parasitoids have spread over 150 km from the release sites in 3 years
- 76% papaya mealybug mortality, reduction in pesticide use





# Impacts of the papaya mealybug biocontrol strategy



Number of papaya growers grown by 15%



Papaya sales increased by 18%



Increased growers' profits by 118%



Income gains of up to US\$2,144/ha







# Tristan's unique buntings under threat from brown scale invasion

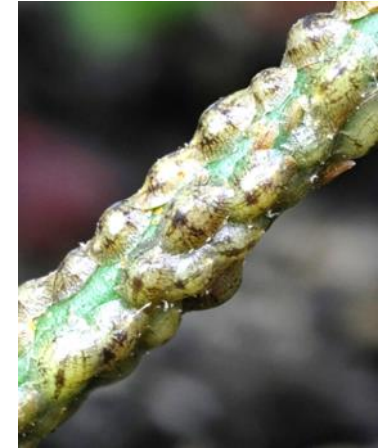


Wilkins' bunting

Rare and endemic *Nesospiza* buntings on Tristan da Cunha's group of islands, evolved to feed on fruits from the only native tree, *Phylica arborea*

A highly polyphagous soft brown scale (*Coccus hesperidum*; Coccidae) invades the islands and threatens the survival of these trees

This threat is on top of significant habit losses due to storm damage in recent years



Soft brown scale  
(*Coccus hesperidum*)



*Phylica arborea* covered in sooty mould



# The solution: A promising control agent

One of the most promising biocontrol agents is the tiny parasitic wasp *Microterys nietneri*

Release on all three islands between 2021 and 2023

The wasp established rapidly and reached infestation rates >50% in some places

*Phyllica* stands became free of sooty mould and have started to recover

Too early to see effect on the buntings, but monitoring continuing by local collaborators



*Microterys nietneri*, male



*Microterys nietneri*, female



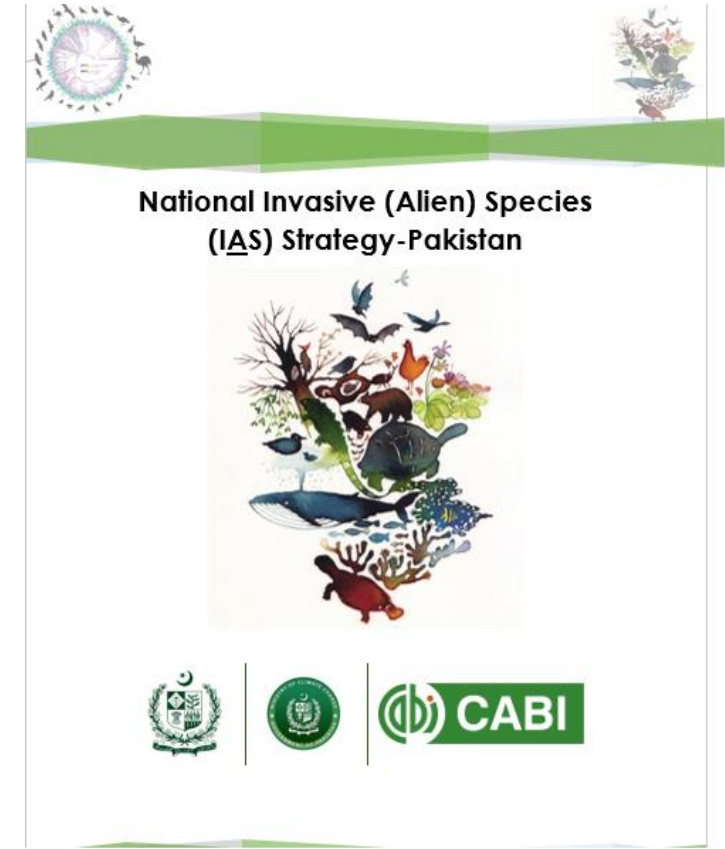
larva inside *C. hesperidum*





# Policies, Strategies, Action Plans and Guidelines

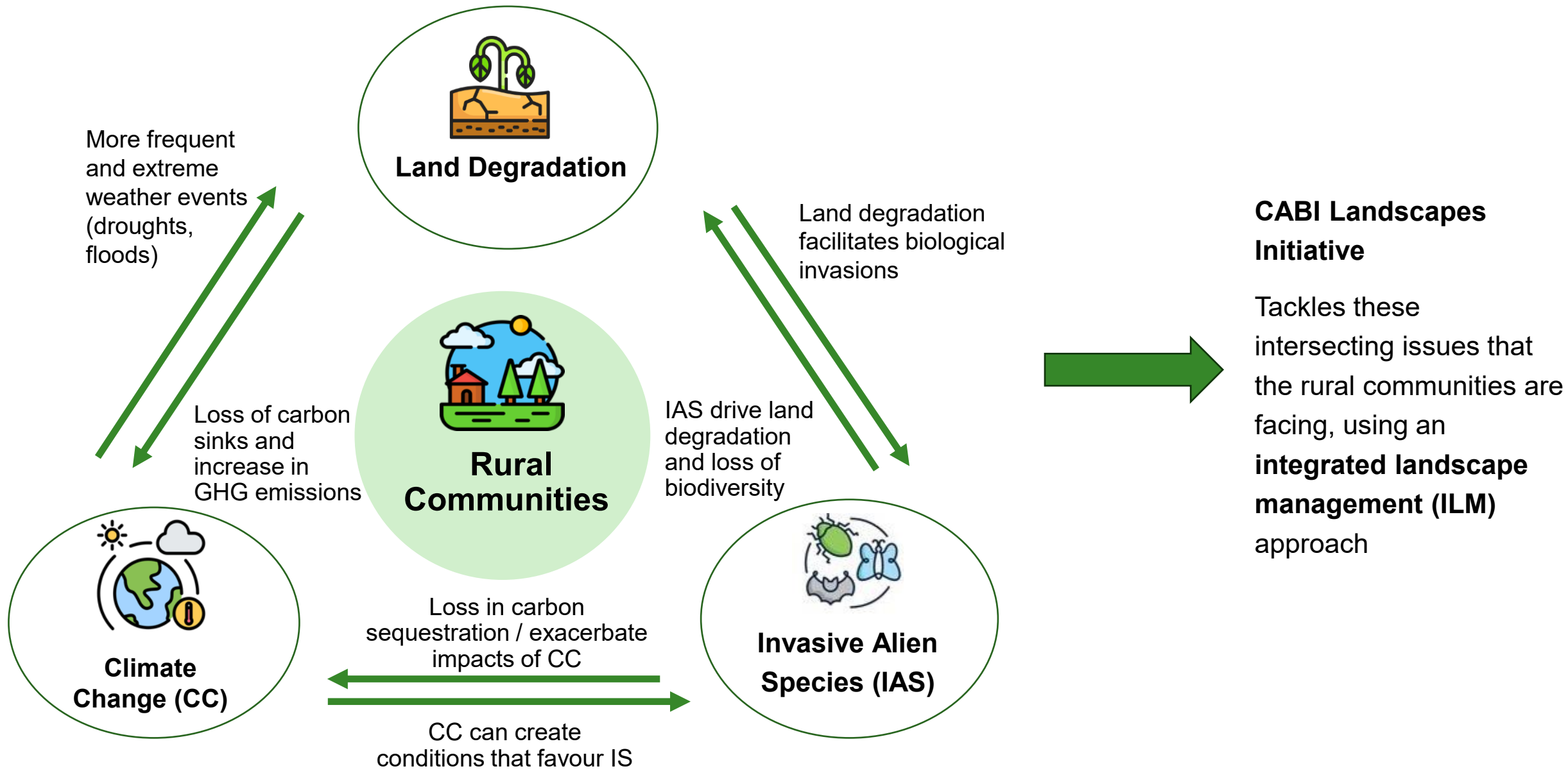
- Facilitate developing National and Regional IS Strategies and Action Plans
- Assist in developing guidelines for import and release of biocontrol agents
- Support harmonization of biopesticide regulations
- Contribute to compliance with and implementation of international protocols (e.g. Nagoya Protocol on ABS)





# CABI Landscapes Initiative







# CABI Landscapes Initiative – the approach used

CABI identified **Integrated Landscapes Management (ILM)** as a viable approach to tackle these complex and tightly interrelated issues

**ILM** refers to a long-term collaboration among diverse stakeholders to foster natural resource resilience at the landscape level with the aim to provide sustainable livelihoods and conserve ecosystem goods and services

**Climate change, land degradation, and invasive species** are major concerns to our Member Countries



# What the Landscapes Initiative will do

1. Strengthening awareness about and knowledge to use ILM approaches
2. Facilitating governance structures that are supportive of ILM approaches.
3. Co-creating and implementing ILM projects through Multi-Stakeholder Forums (MSFs)
4. Developing long-term income sources.



**Resilient landscapes** that protect **biodiversity** and provide ecosystem services that support **sustainable livelihoods** in the face of a changing climate

# Landscapes Initiative – expected impacts

1. Higher food security
2. Improved livelihoods and well-being
3. Strengthened governance systems
4. Increase in the area of land under sustainable climate resilient natural resource management

We are planning to reach  
**50 million people** in the next 10 years



Source: Cropnuts





CABI as an international intergovernmental not-for-profit organization, gratefully acknowledges the generous support received from our many donors, sponsors and partners. In particular we thank our Member Countries for their vital financial and strategic contributions.