

Trajectories of forest ecosystem recovery with *Acacia mangium* in the Philippines: what made it a successful story

Jenny Vivian, Robin L. Chazdon, Alison Shapcott, Alexandra A. Catling, David J. Lee



VISAYAS
STATE UNIVERSITY

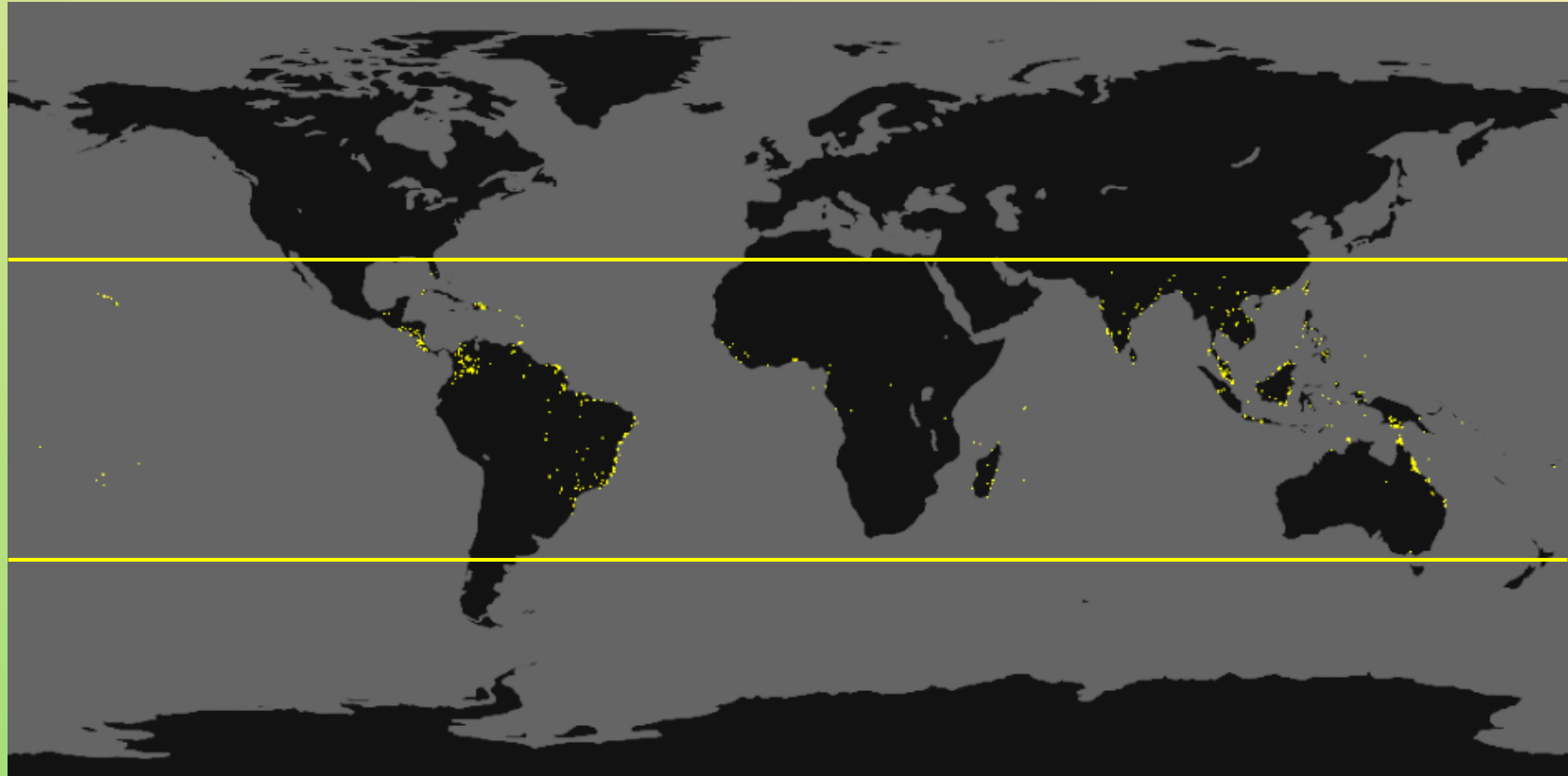


University of the
Sunshine Coast
Australia



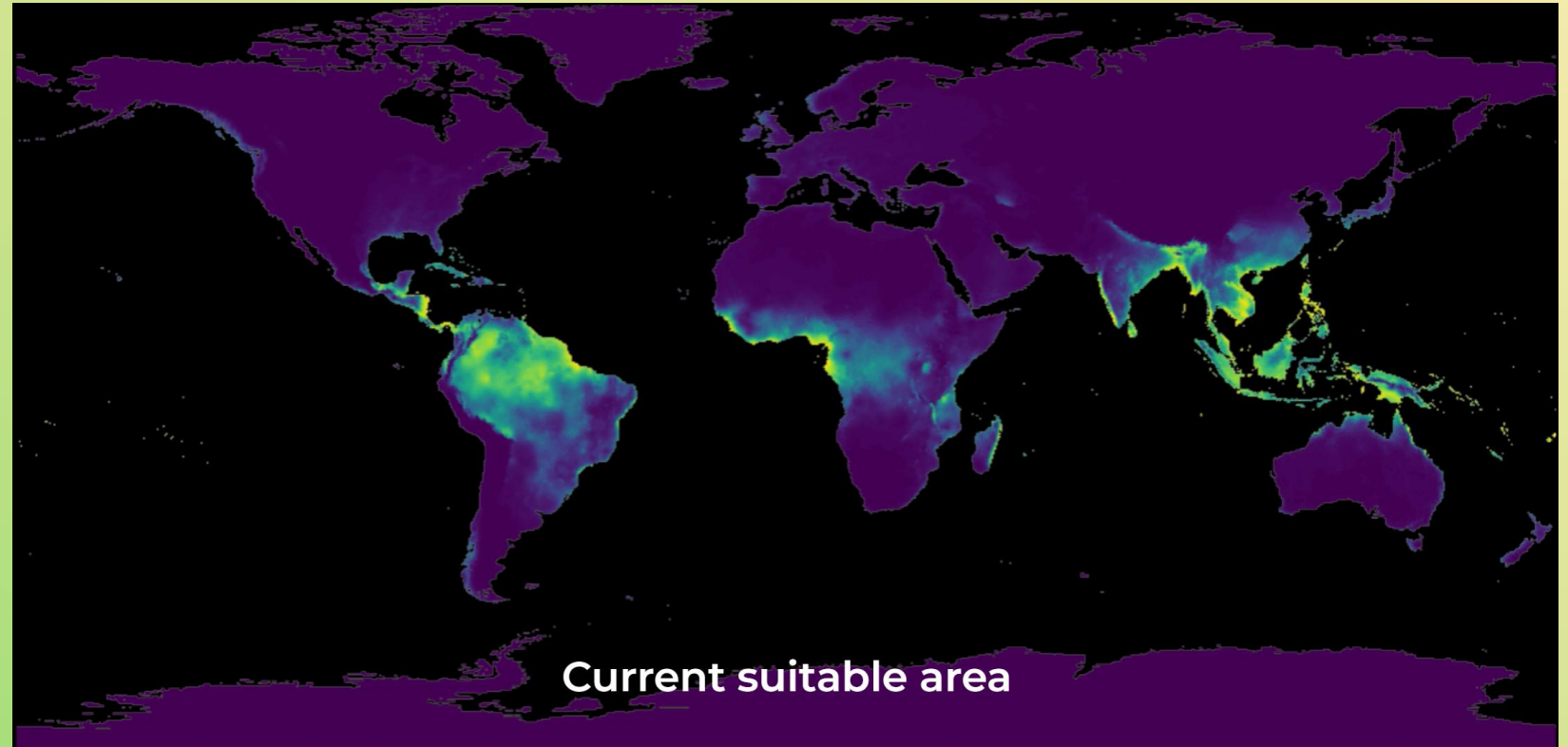
Presence and importance of *Acacia mangium*

- Soil nutrients improvement
- Control soil erosion
- Timber and paper production
- Restore degraded areas
- Carbon sequestration



Distribution of *A. mangium* over time and its risk of invasion

- Bio-ecological characteristics make it prone to invade areas
- Increase in the distribution and a downward trend



Acacia mangium in the Philippines: case study



- Not invasive
- Used for timber, light furniture, and carbon sequestration
- Monocultures, when minimally managed, develop remnant forest characteristics

Grassland



2-year-old *Acacia mangium* plantation



10-year-old *Acacia mangium* plantation



24-year-old *Acacia mangium* plantation



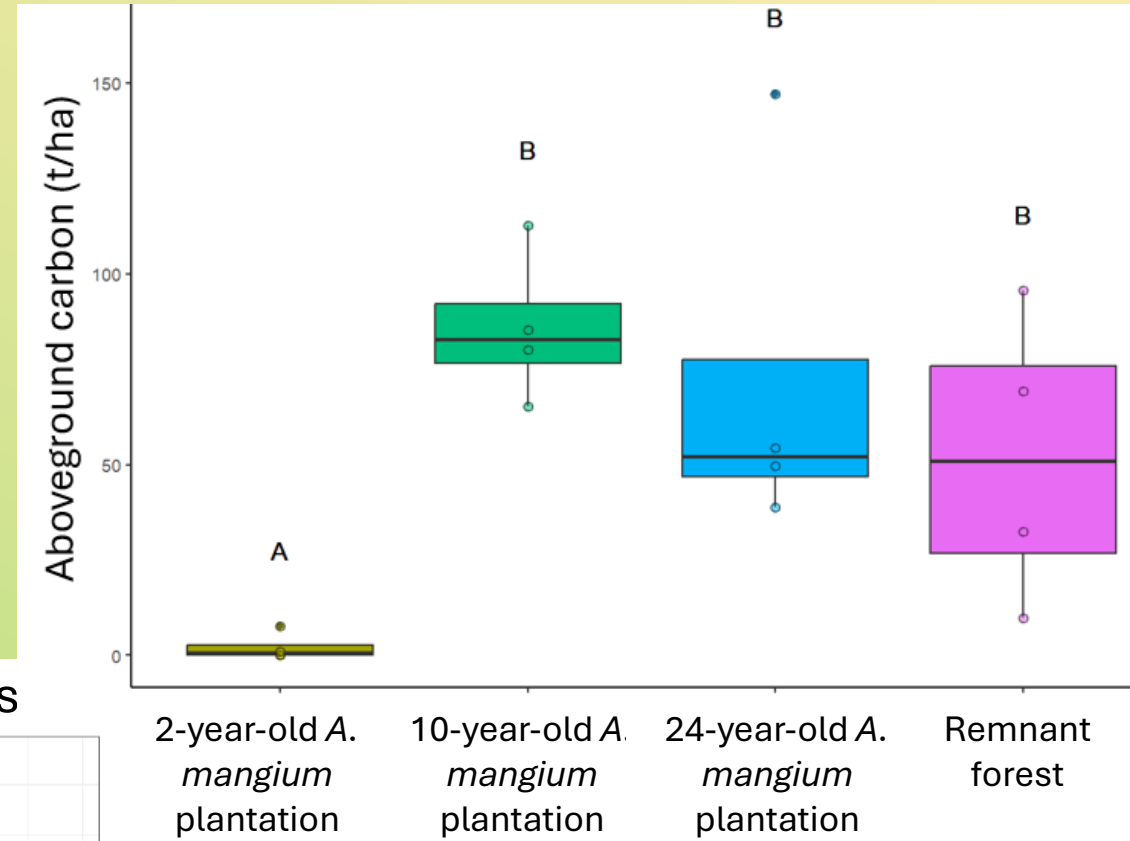
Remnant forest



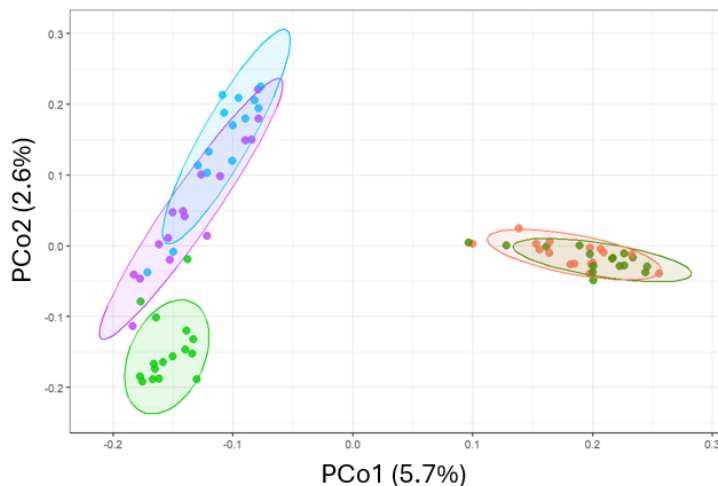
Acacia mangium in the Philippines: case study

From minimally managed *A. mangium* monocultures:

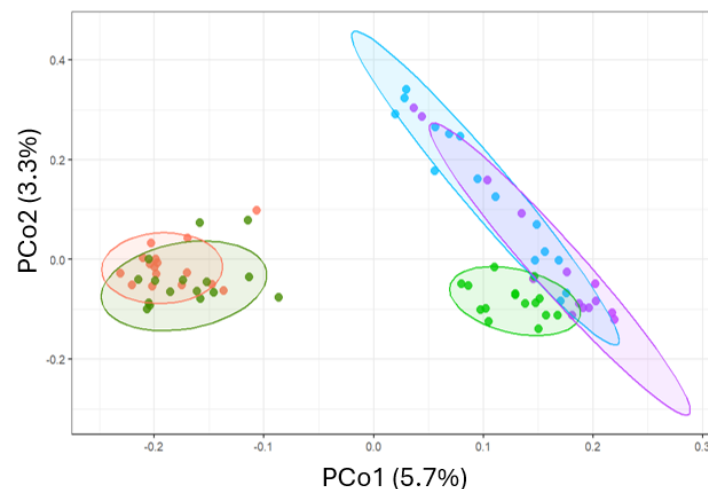
- Restoration of the (standing tree) aboveground carbon stock
- Recovery trajectory of the tree community and soil microbial community



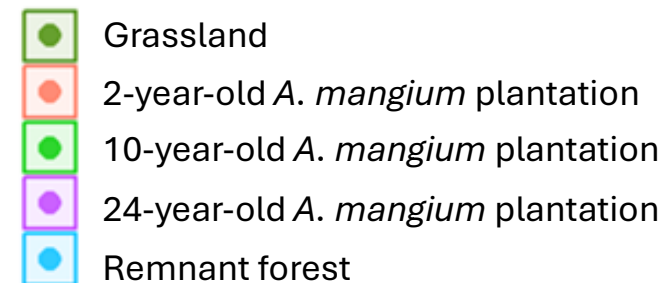
Fungi communities



Bacteria communities



Landcover



Acacia mangium in the Philippines compared to other contexts

	Case study in Biliran, Philippines	Invasive		Exotic non-invasive
		Brazil, Roraima	Brunei	Subtropical China
Seasonality	Not pronounced	Dry and wet seasons	Not pronounced	Dry and wet seasons
Disturbances	Fire, typhoons	Fire	Droughts and fire; Infrastructure development	Fire
Landscape features	Hilly area, remnant forests	Savannahs, semideciduous forests, crops, gallery forests	Lowland, matrix of open forests, urban areas, farms	Hilly area, other plantations; small villages and roads
Management type	Weeding before 2 years, occasional harvesting, fire occurrence control	Fire exclusion (some silvicultural)	Silvicultural practices	Protected

Possible conditions promoting

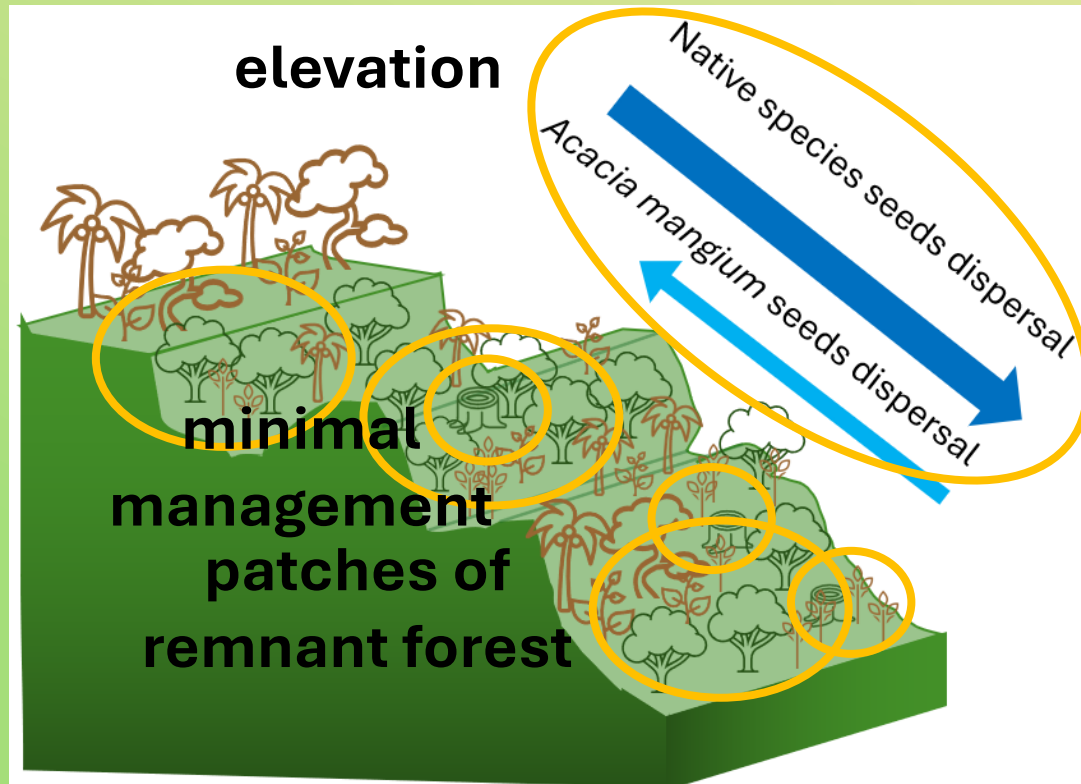
Natural regeneration without invasive traits:

- Landscape with remnant forest, other plantations
- Lack of extensive management

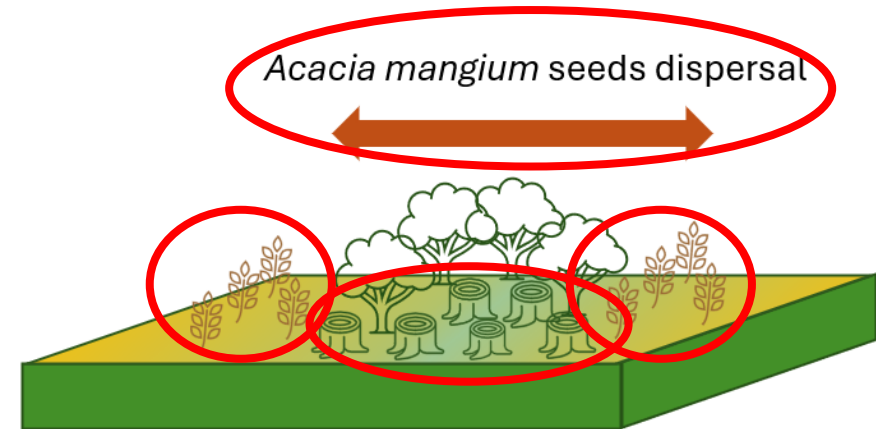
Invasive traits:

- Landscape of degraded grassland, savannahs
- Presence of extensive management

Conditions possibly promoting the beneficial role of *A. mangium* for forest restoration



Naturally regenerating *A. mangium* plantations



Invaded areas from *A. mangium* plantations

Possible factors influencing the likelihood of forest restoration with *A. mangium*

Complex landscape	Establishment of plantations within a mosaic of remnant forests and hilly areas
Lack of management	Avoid post-establishment weeding , and undergrowth removal ; promoting shade , humidity retention
High biodiversity (expressing seeds and seedlings predation)	Promotion of high native biodiversity



Possible factors influencing the likelihood of forest restoration with *A. mangium*

Complex landscape	Establishment of plantations within a mosaic of remnant forests and hilly areas
Lack of management	Avoid post-establishment weeding, and undergrowth removal; promoting shade, humidity retention
High biodiversity (expressing seeds and seedlings predation)	Promotion of high native biodiversity



Possible factors influencing the likelihood of forest restoration with *A. mangium*

Complex landscape	Establishment of plantations within a mosaic of remnant forests and hilly areas
Lack of management	Avoid post-establishment weeding, and undergrowth removal; promoting shade, humidity retention
High biodiversity (expressing seeds and seedlings predation)	Promotion of high native biodiversity



Possible factors influencing the likelihood of forest restoration with *A. mangium*



Thank you

Presenter: Jenny Vivian, PhD candidate



VISAYAS
STATE UNIVERSITY



University of the
Sunshine Coast
Australia

jennyvivian99.github.io

