

Commonwealth Blue Charter webinar: Unlocking the wealth of mangrove ecosystems

27 July 2020



The Commonwealth

Commonwealth Blue Charter webinar: Unlocking the wealth of mangrove ecosystems

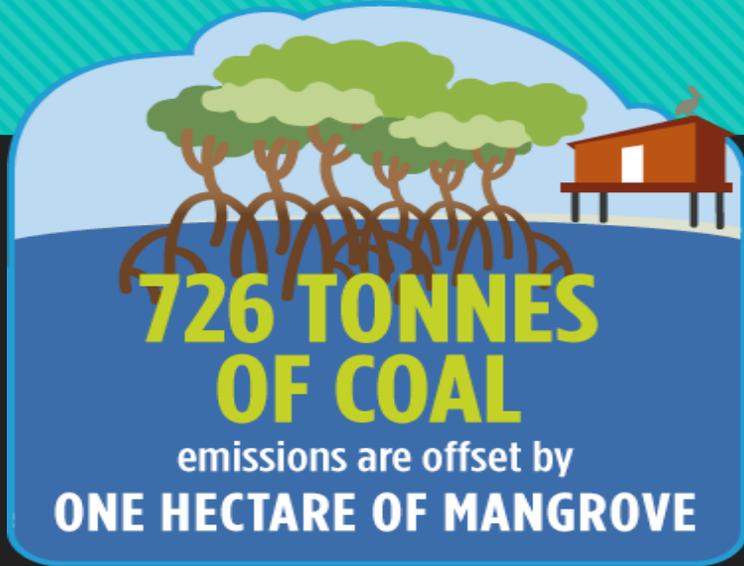
2:00 PM - 2:05 PM	Opening Remarks Mr Jeff Ardron, Adviser - Ocean Governance and Project Lead, Commonwealth Blue Charter, Commonwealth Secretariat
2:05 PM - 2:10 PM	Special Address from the Blue Charter Action Group Champion for Mangrove Ecosystems and Livelihood Ms Hasanthi Dissanayake, Director General, Ocean Affairs, Environment and Climate Change, Ministry of Foreign Relations, Sri Lanka
2:10 PM - 2:35 PM	Presentations by the Speakers Dr Rahanna Juman, Director (Acting), Institute of Marine Affairs, Trinidad and Tobago Dr Judith Okello, Senior Research Scientist, Kenya Marine and Fisheries Research Institute, Ministry of Agriculture, Livestock and Fisheries, Kenya Ms Achini Fernando, Assistant Marine Environment Officer, Marine Environment Protection Authority, Sri Lanka Ms Leah Glass, Global Strategic Lead - Mangrove Conservation, Blue Ventures
2:35 PM - 2:55 PM	Question & Answers
2:55 PM - 3:00 PM	Concluding Remarks



International Day for the Conservation of the Mangrove Ecosystem – JULY 26

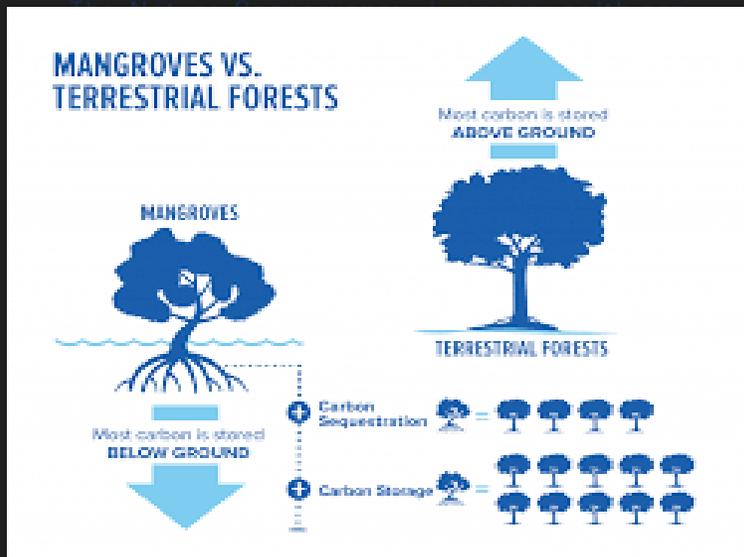
- ❖ The International Day for the Conservation of the Mangrove Ecosystem, adopted by the General Conference of UNESCO in 2015 and celebrated each year on 26 July.
- ❖ It is aimed at raising awareness of the importance of mangrove ecosystems as “a unique, special and vulnerable ecosystem” and to promote solutions for their sustainable management, conservation and uses.

Carbon in take potential of mangrove forests is 3- 5 times higher than tropical upland forests



726 TONNES OF COAL
emissions are offset by
ONE HECTARE OF MANGROVE

MANGROVES VS. TERRESTRIAL FORESTS



MANGROVES
Most carbon is stored **BELOW GROUND**

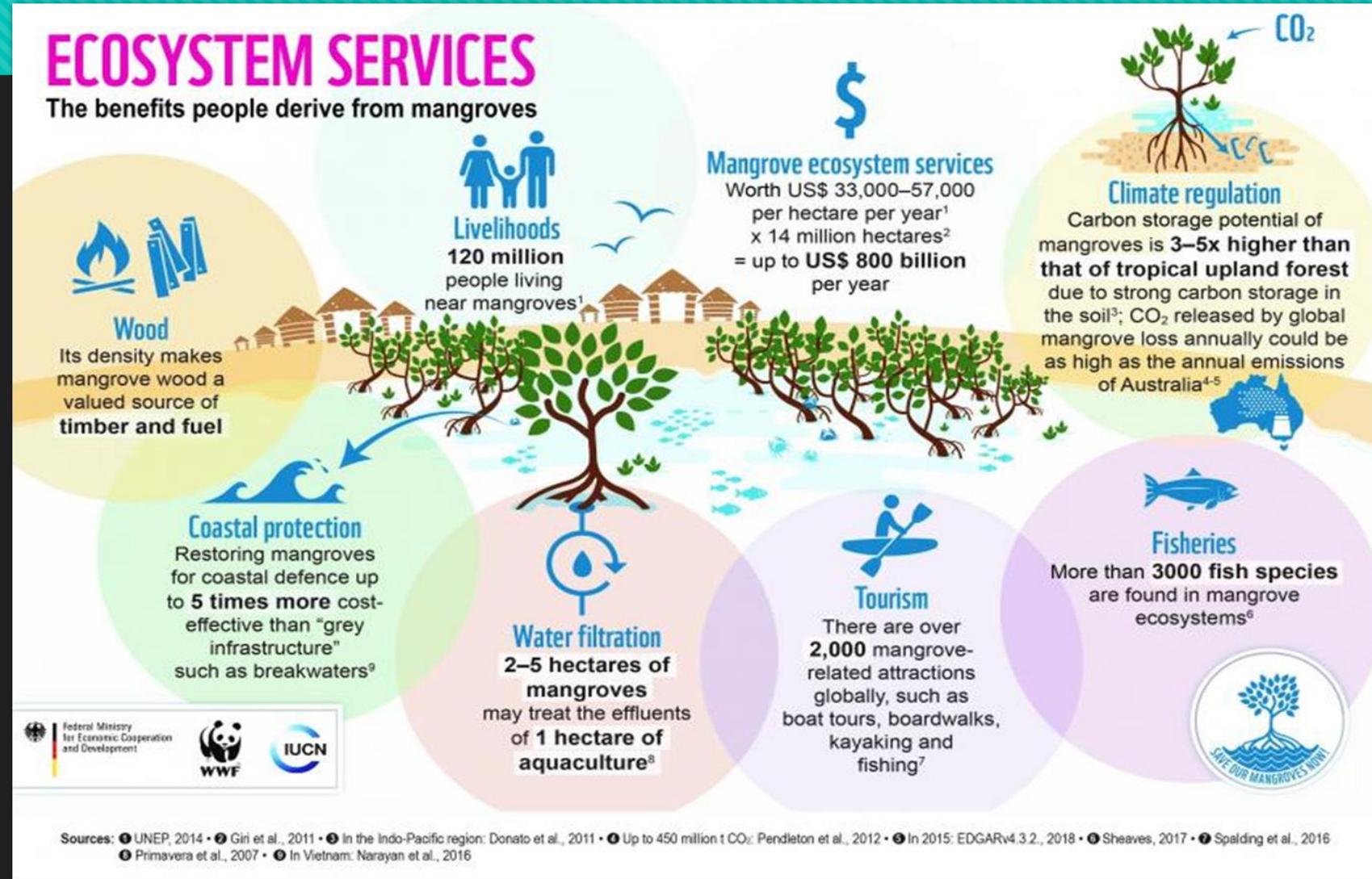
TERRESTRIAL FORESTS
Most carbon is stored **ABOVE GROUND**

Carbon Sequestration: 1 mangrove tree = 4 terrestrial trees

Carbon Storage: 1 mangrove tree = 10 terrestrial trees

ECOSYSTEM SERVICES

The benefits people derive from mangroves



Wood
Its density makes mangrove wood a valued source of timber and fuel

Livelihoods
120 million people living near mangroves¹

Mangrove ecosystem services
Worth US\$ 33,000–57,000 per hectare per year¹
x 14 million hectares²
= up to **US\$ 800 billion** per year

Climate regulation
Carbon storage potential of mangroves is **3–5x higher** than that of tropical upland forest due to strong carbon storage in the soil³; CO₂ released by global mangrove loss annually could be as high as the annual emissions of Australia⁴⁻⁵

Coastal protection
Restoring mangroves for coastal defence up to **5 times more** cost-effective than “grey infrastructure” such as breakwaters⁹

Water filtration
2–5 hectares of mangroves may treat the effluents of **1 hectare of aquaculture**⁸

Tourism
There are over **2,000** mangrove-related attractions globally, such as boat tours, boardwalks, kayaking and fishing⁷

Fisheries
More than **3000** fish species are found in mangrove ecosystems⁶

Logos: Federal Ministry for Economic Cooperation and Development, WWF, IUCN

Sources: ① UNEP, 2014 • ② Giri et al., 2011 • ③ In the Indo-Pacific region: Donato et al., 2011 • ④ Up to 450 million t CO₂: Pendleton et al., 2012 • ⑤ In 2015: EDGARv4.3.2., 2018 • ⑥ Sheaves, 2017 • ⑦ Spalding et al., 2016 • ⑧ Primavera et al., 2007 • ⑨ In Vietnam: Narayan et al., 2016

50% of global mangrove cover has been lost over the last 50 years

THREATS

Drivers of mangrove loss



Logging

can cause altered species composition, fragmentation and total clearance of mangrove forests



Agriculture

Conversion to rice paddies responsible for 88% of mangrove loss in Myanmar¹⁰



Mangrove loss

35% between 1980 and 2000¹ - the equivalent of losing almost 150,000  annually², and 4 times higher than overall global forest loss³



Climate change

Air temperature and rainfall regimes influence global mangrove distribution⁴; abrupt changes in sea level are a primary cause of local and regional extinctions⁴⁻⁶



Aquaculture

causes more than half of mangrove losses globally, mostly due to shrimp culture⁹



Coastal development

Urbanisation drives mangrove loss and degradation; human population density in coastal regions 3 times higher than global average⁷



Pollution

Mangrove's aerial roots, through which they obtain oxygen, can easily be smothered and clogged by sediment, solid waste and oil⁸



Sources: ¹ Millennium Ecosystem Assessment, 2005 • ² 0.66% or 102,000 hectares annually (2000-2005): FAO, 2007 • ³ Spalding et al., 2010 • ⁴ Alongi, 2015 • ⁵ Duke et al., 2017 • ⁶ Lovelock et al., 2017 • ⁷ Small et al., 2003 • ⁸ UNEP, 2014 • ⁹ Valiela et al., 2001 • ¹⁰ Over 2000-2012: Richards & Friess, 2016

The Commonwealth Blue Charter

The Commonwealth Blue Charter is an agreement by all 54 Commonwealth countries to actively co-operate to:

- ❖ solve ocean-related problems; and,
- ❖ meet commitments for sustainable ocean development.

The process is effected through 10 Action Groups and Mangrove Ecosystems and Livelihoods is one of them, which is championed by Sri Lanka.

Mangrove Ecosystems and Livelihoods Action Group

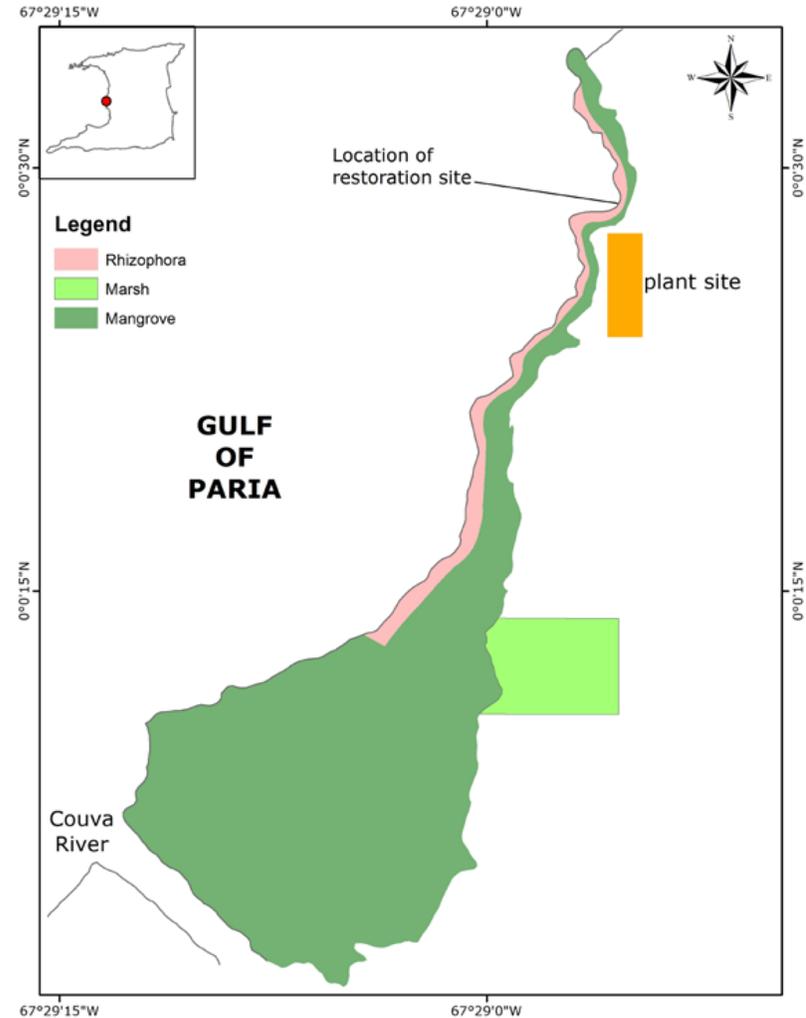
- ❖ In the world, Sri Lanka is leading in mangrove conservation in many fronts – policy, restoration, community participation, etc.
- ❖ Current members of the Action Group are: Australia, Bangladesh, Bahamas, Jamaica, Kenya, Nigeria, Pakistan, Sri Lanka, Trinidad and Tobago, the United Kingdom and Vanuatu.
- ❖ Sri Lanka hosted the first meeting of Action Group in October 2019.
- ❖ Going forward, MELAG continues to share best practices, working on further analyzing mangrove policy and practices in member countries, identifying and initiating processes for capacity building related issues, while ways and means for regional collaborations and on-ground support for conservation and restoration are also being considered, amidst COVID-19 pandemic.

“If there are no mangroves, then the sea will have no meaning. It's like a tree with no roots, for the mangroves are the roots of the sea !”

Mad-Ha Ranwasii, a Thai fisherman & village headman, 1992.



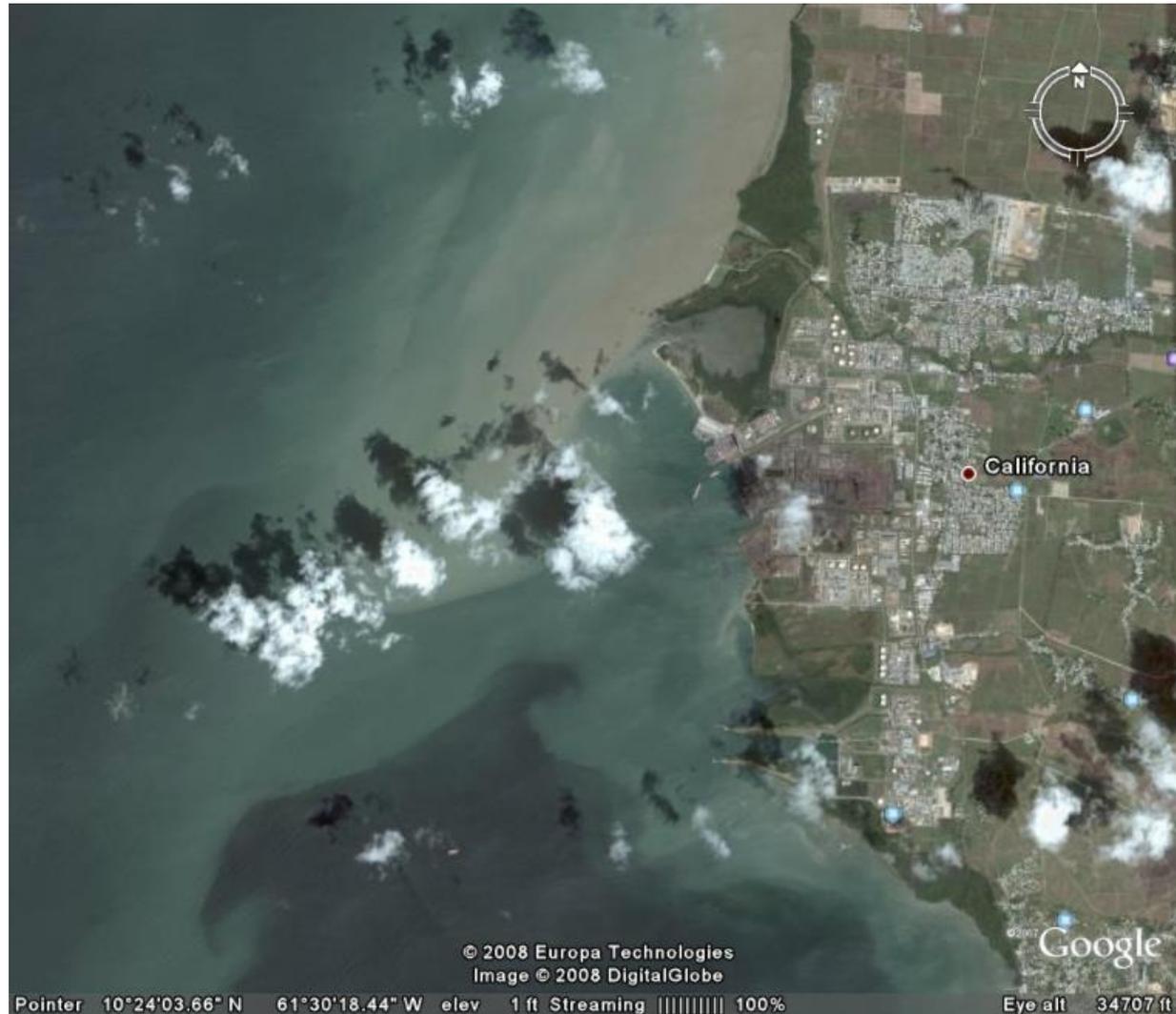
TRINIDAD AND TOBAGO CASE STUDY: RESTORATION OF A MANGROVE SYSTEM IN POINT LISAS



Rahanna A. Juman Ph.D

Institute of Marine Affairs, Trinidad and Tobago

Point Lisas Industrial Estate



In 1979, 500 ha of mangrove from the Couva –Claxton systems were cleared for development of the Point Lisas Industrial Estate

In 1997, an ammonia plant cleared mangrove to pass an effluent pipeline to the sea

Objectives:

1. Determine why natural regeneration of mangrove in this area did not occur
2. Prepare site and replant mangrove seedlings in the area

**Wetland area to be restored (approx. 1200m²)
prior to preparation and replanting**

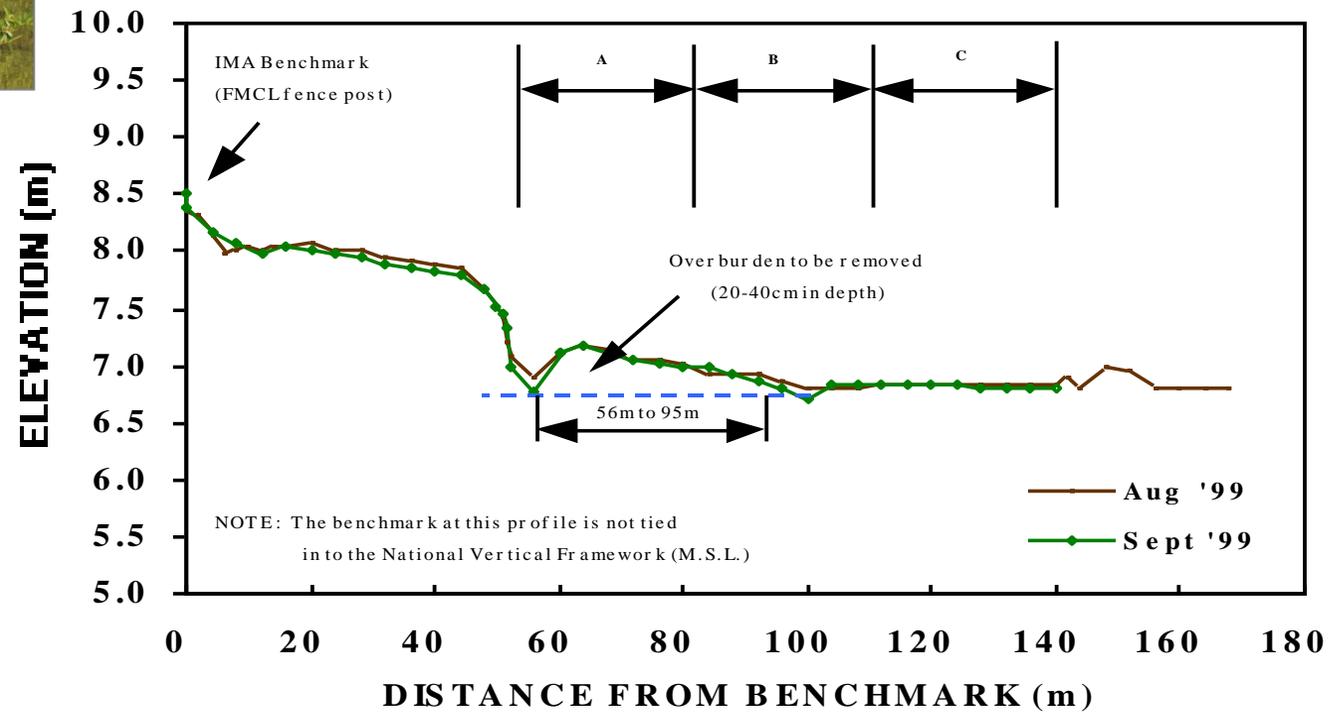


APPROACH TO PROJECT:

Profile data being collected in area to be restored



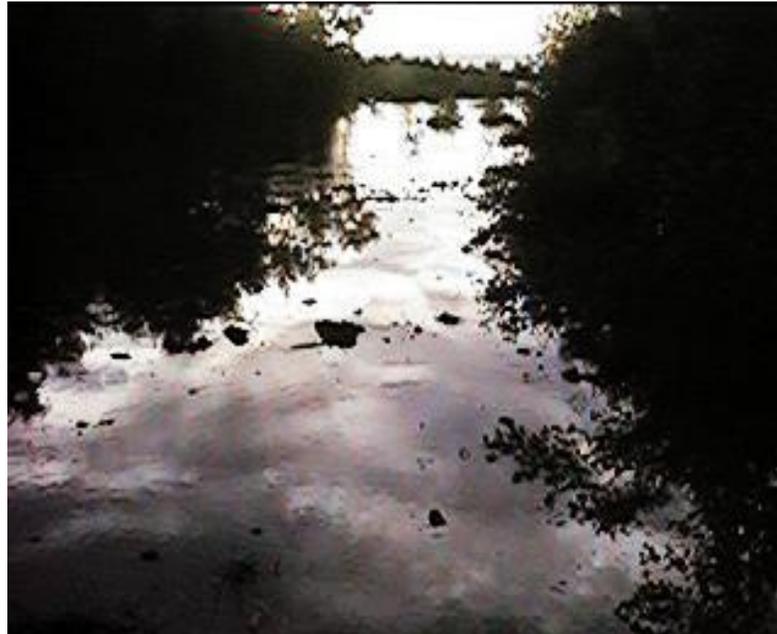
North Couva River Mangrove System - Profile along cleared site, showing areas to be replanted prior to preparation.
A - large saplings, B - black seedlings, C - red seedlings.



Excavation work being carried out in landward area



Restoration site flooded at high tide after being leveled, prior to replanting



Mangrove planting



170 red, 76 black and 15 white mangroves were replanted

Species composition 10 months after replanting

Species	# Planted	# Survived	# Natural Colonizers
Red mangrove	170	10	
Black mangrove	76	45	169
White mangrove	15	10	120



**REPLANTED AREA 10 MONTHS AFTER
(AUGUST 2000)**



**BY 2006
DENSITY 13 TREES/ 0.01 HA,
AVE HEIGHT=9.9 M \pm 1.9,
AVE DBH =11.71 \pm 5.9 CM**

IMPLICATION FOR MANGROVE RESTORATION EFFORT

- Determine cause of die-off; whether chronic or acute
- Determine why natural regeneration has not occurred
- Determine whether the physical characteristics of the sites has been altered
- Restore the physical environment – tidal hydrology
- Natural colonization will occur once there is a source of seedlings in the area
- Mangrove planting should be the final option



Race to save the once little known swimming tidal forests

Dr. Judith Okello
KMFRI-Mombasa

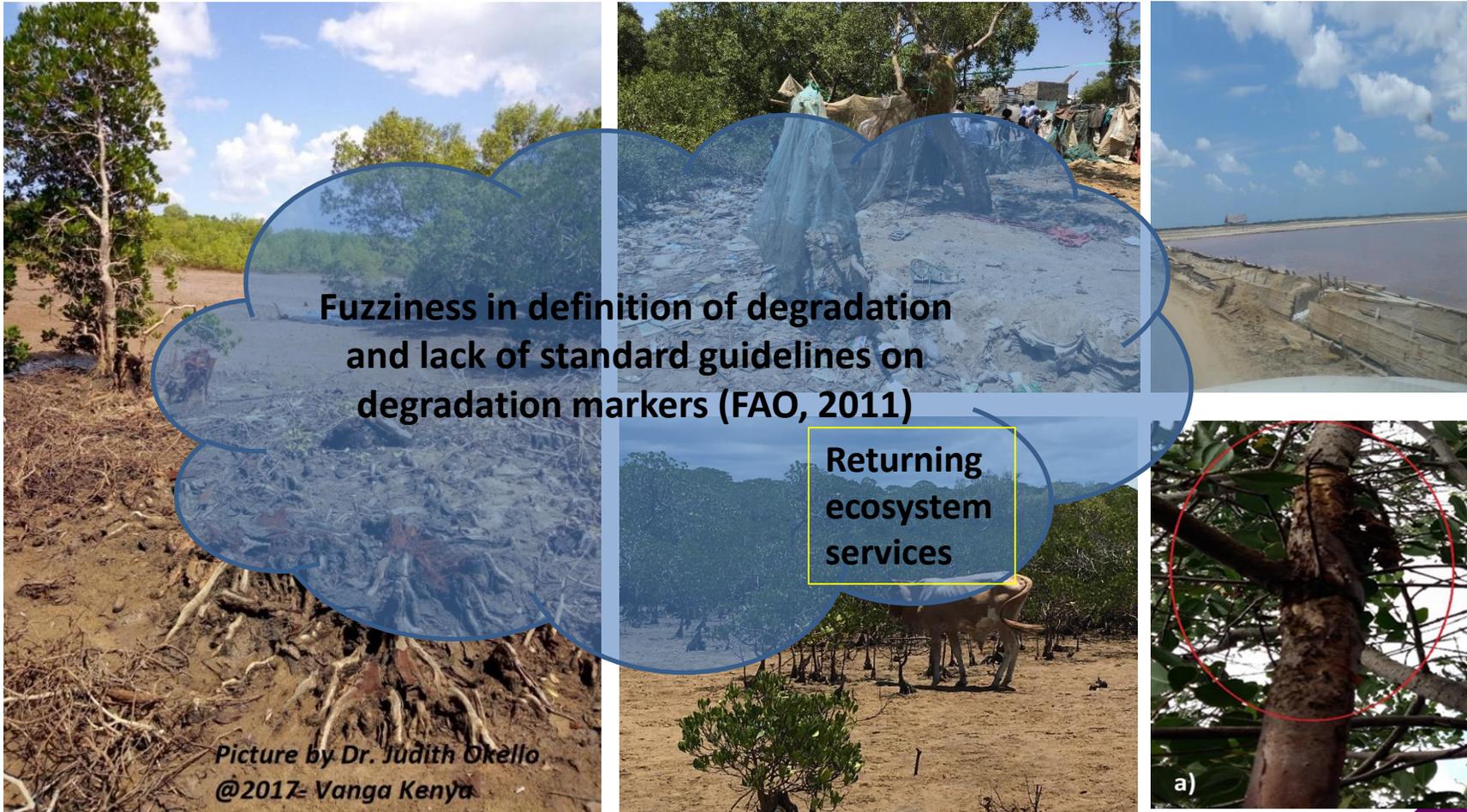
Unlocking the wealth of mangrove ecosystems

Commonwealth Blue Charter webinar

GoToWebinar | 14:00 – 15:00 BST (GMT + 1), 27 July 2020



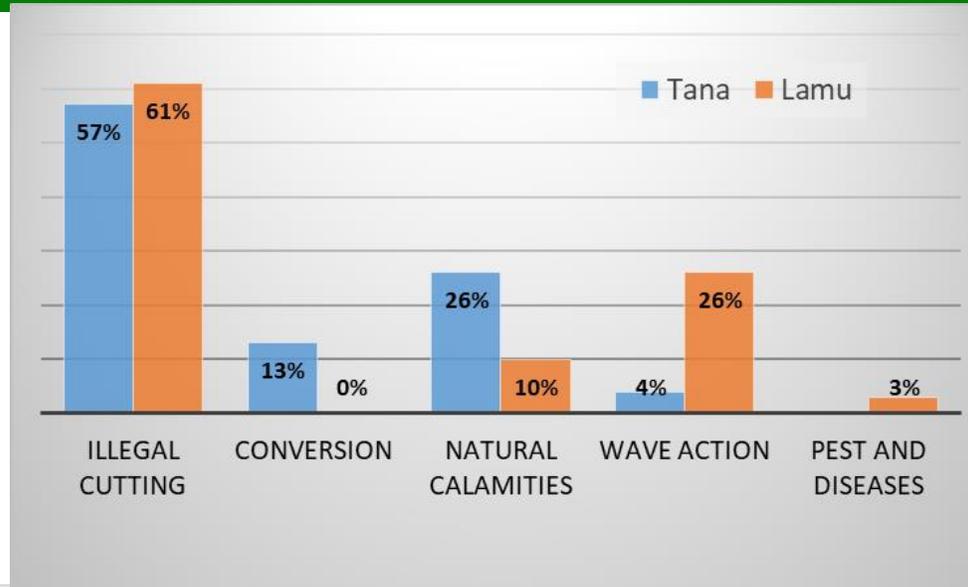
Mangroves threatened yet critical



Ecological settings of degraded mangrove sites

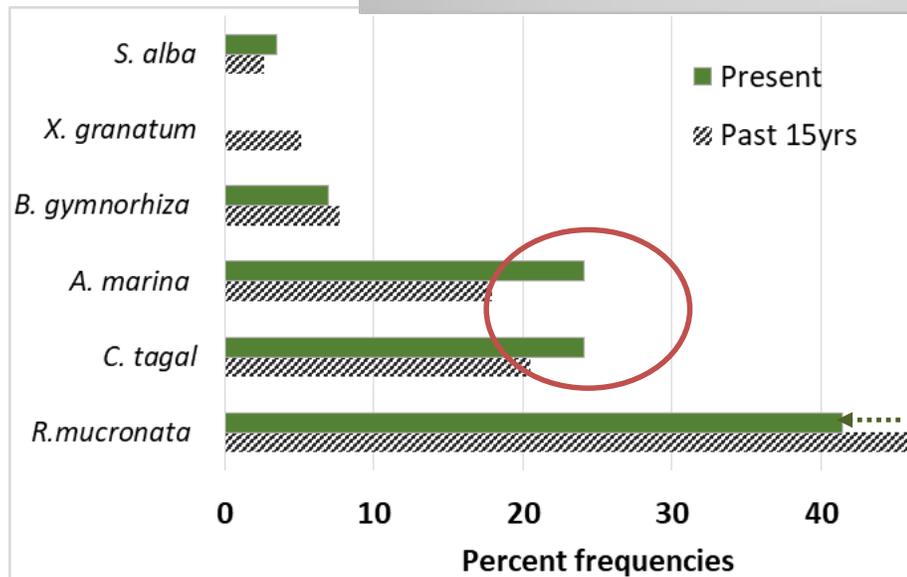
- KII, FGD: 30 villages- proximity to mangrove area
 - what sites the locals consider as degraded; temporal variations in species composition, utilization patterns,
- Systematic sampling in perceived degraded areas (satellite imagery and community)
 - Structure; include species in adjacent area
 - Densities of stumps, fallen and standing dead trees, and the regeneration status.
 - Environmental variables: salinity range, redox potential, inundation frequency
- Mangrove cover change analysis 2010 to 2019

Degradation from the local's perspective

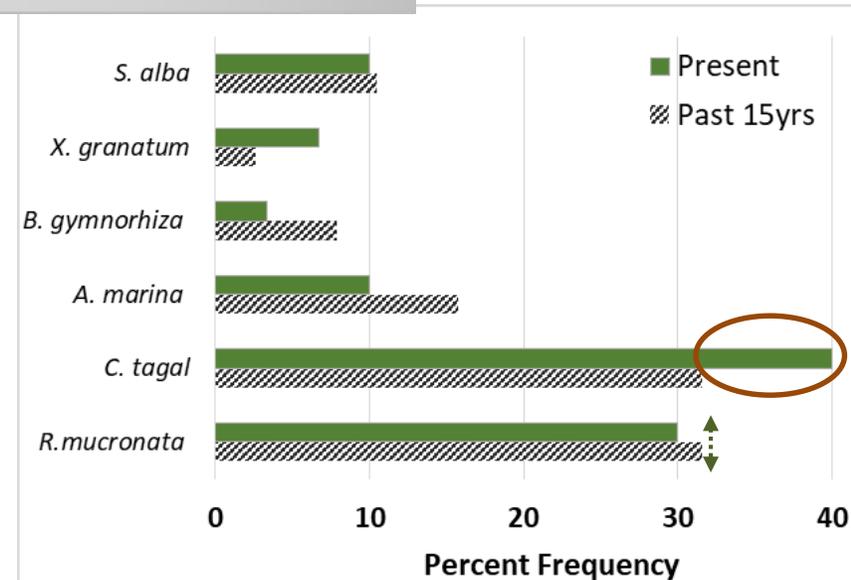


- Bare areas
- Fallen trees
- Areas with stump remains
- Silted trees

Male



Female



Ecological characteristics

Natural regeneration >
2,500/ha (FAO, 1994)

Area	Density (counts/ha)				
	Stumps	Dieback	Fallen dead	Standing dead	Natural regeneration
Kiunga (Protected)	58.9	55.2	28.6	114.6	5068.9
Pate	1918.5	0.0	0.0	4.3	10950.0
Lower Tana Delta	933.9	208.9	37.5	132.1	904.2

- Kiunga- standing dead
- Pate almost purely overexploitation
- Lower Tana Delta- Integrated causes

Mean=127
counts/ha

Mean=67
counts/ha



Conclusion



- Cutting of mangrove wood cited as a major form of degradation (even in areas where ecological data proved otherwise)
- Locals do not immediately recognize absence of given pole size as degradation
- Historical data from local community important in guiding rehabilitation
- **Need to put more effort in conserving the mangroves of the delta**



Mangroves everywhere: No two stands similar

Achini Wathsala Fernando

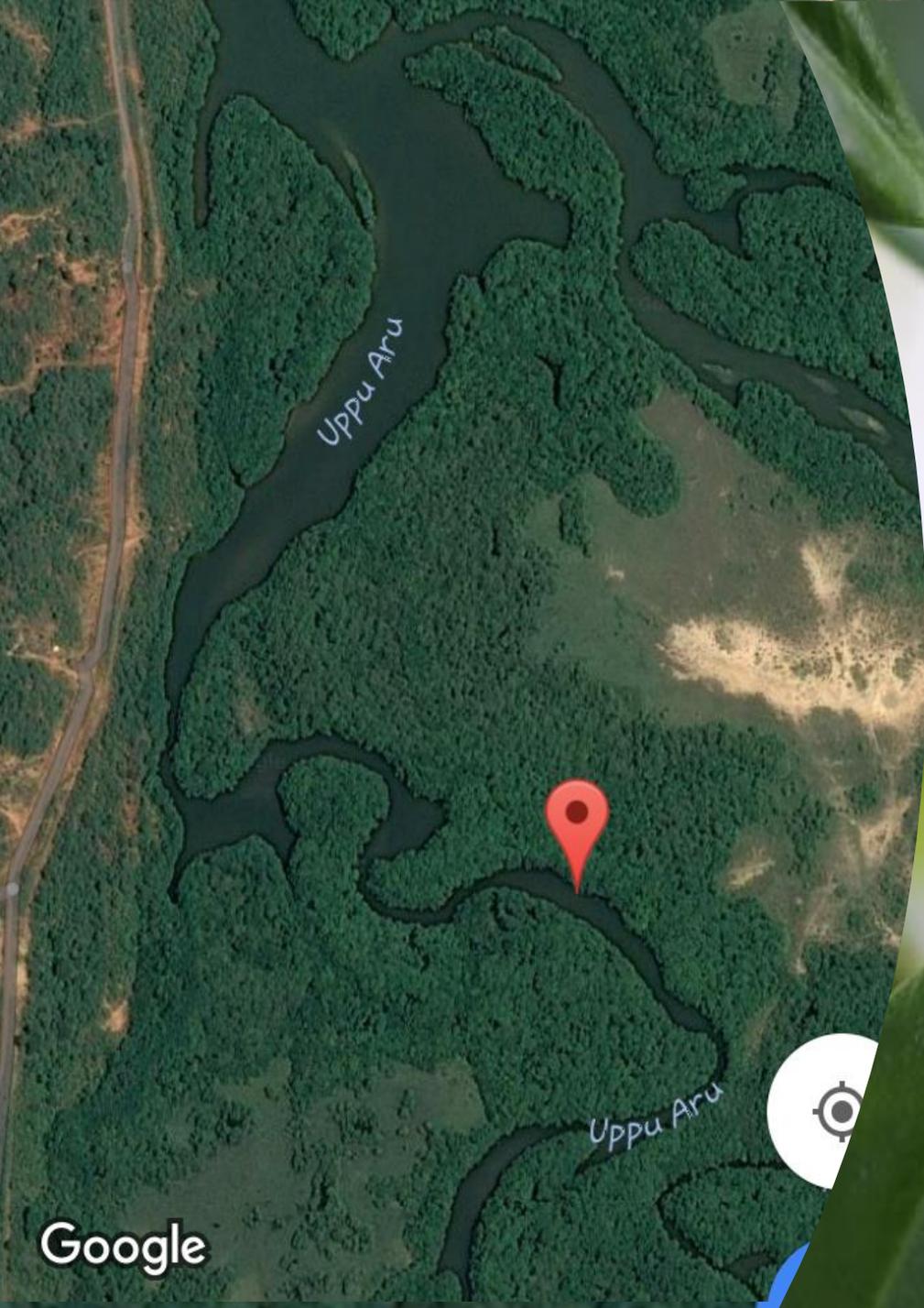


Species

IUCN Red List 2012

1	<i>Sonneratia marina</i> (Forsk.) Vierh.	LC
2	<i>Avicennia marina</i> (L.) L.	NT
3	<i>Lumnitzera racemosa</i> Choisy	NT
4	<i>Excoecaria agallocha</i> L.	LC
5	<i>Pemphis acidula</i> Forst.	NT
6	<i>Xylocarpus granatum</i>	EN
7	<i>Bruguiera cylindrica</i> (L.) Blume	EN
8	<i>Bruguiera gymnorhiza</i> (L.) Lamk.	VU
9	<i>Ceriops tagal</i> (Perr.) C.B. Robinson	NT
10	<i>Rhizophora apiculata</i> BL	NT
11	<i>Rhizophora mucronata</i> Lamk.	LC
12	<i>Scyphiphora hydrophyllacea</i> Gaertn.f.	LC
13	<i>Aegiceras corniculatum</i> (L.) Blanco	LC
14	<i>Sonneratia alba</i> J. Smith	EN

32 mangrove associates including 3 near threatened

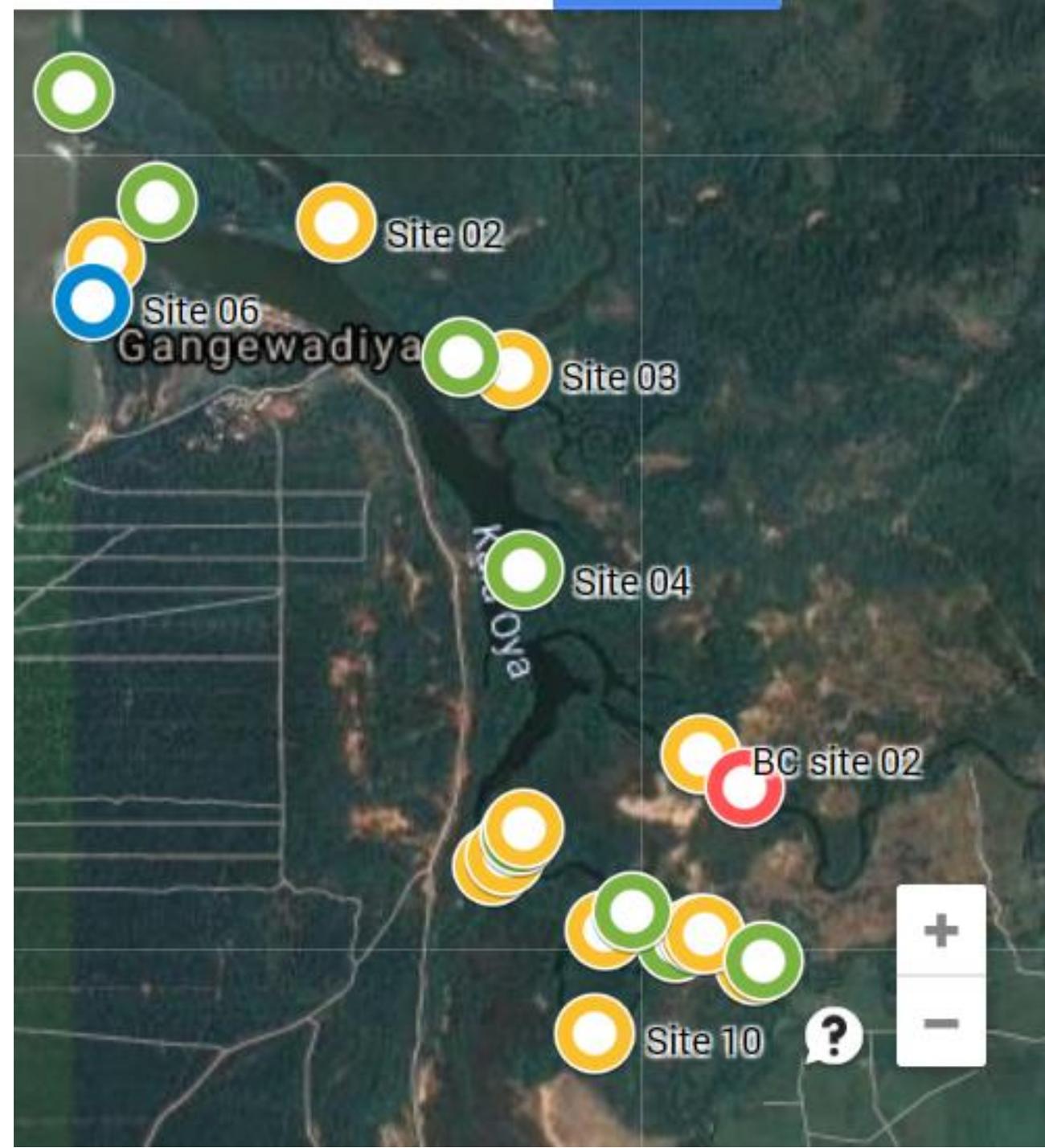


*Scyphiphora
hydrophyllacea*
Gaertn.f.

Mapping of
vulnerable
and their
point
locations

Shannon Weinner Index of Species Diversity

Value	Color Code
0.0000-0.5000	Blue
0.5100-1.0000	Yellow
1.1000-1.5000	Orange
1.5100-2.0000	Green
2.1000-2.5000	Purple
2.5100-3.0000	Red



Importance of data for evidence-based management

- Data revealed within estuary species distributions
 - Helped in identifying areas that harbour vulnerable species
 - Established the status of underlying threats to ecosystem
 - Enabled developing mangrove ecosystem based eco-tourism plan
-

- **Forms the baseline for future monitoring of this ecosystem**





UK International Climate Finance - Blue Forests Project

Empowering coastal communities and
averting climate breakdown



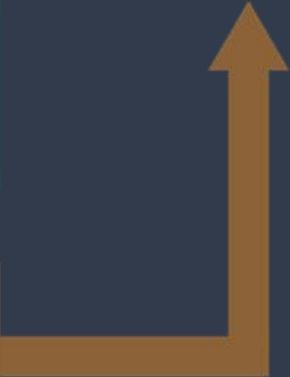
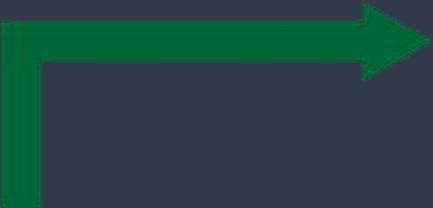
Destruction of mangroves for
aquaculture, agriculture,
timber and charcoal

Lack of property rights for communities
= no incentive for sustainable management

Few viable alternative livelihoods
= communities are forced to harvest natural
resources

Mangroves and their ecosystem services
are undervalued
= lack of funding for mangrove management

Ineffectual forest governance
= communities have no control over their
forests



An aerial photograph of a coastal mangrove forest. The water is a vibrant turquoise color, and a white sandy beach is visible. The mangrove trees are lush green and densely packed. The surrounding land is a mix of greyish-brown soil and sparse vegetation.

The Blue Forests Initiative



Blue carbon and mangrove management



Fisheries management



Resource governance



Alternative livelihoods



Community health



Madagascar

Indonesia



blue ventures
beyond conservation

www.blueventures.org

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