Locally managed marine areas in Kimbe Bay: Reflections and future possibilities

Russ Wise, James Butler, Tim Skewes, Nellie Bou, Nate Peterson and Barbara Masike-Liri

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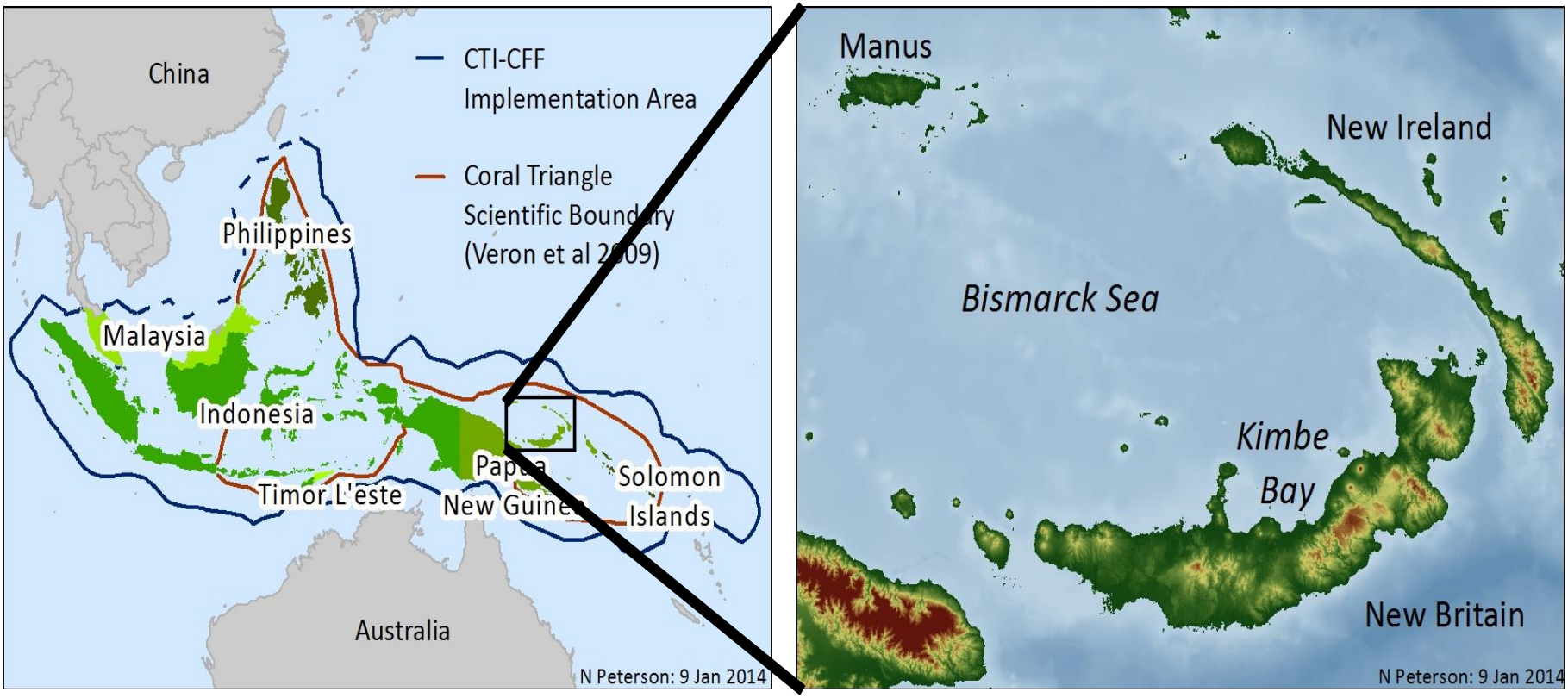
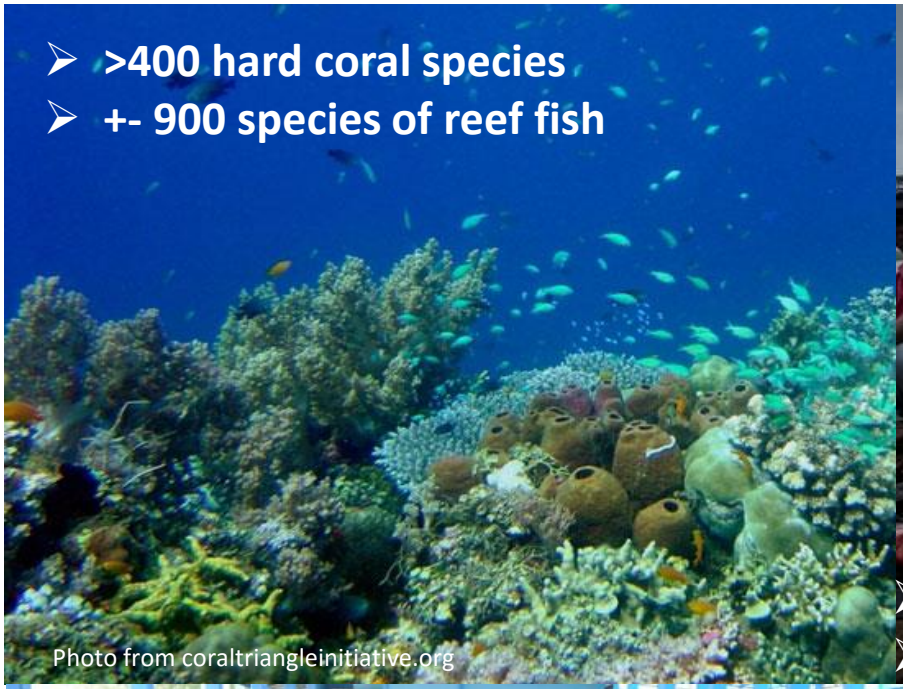
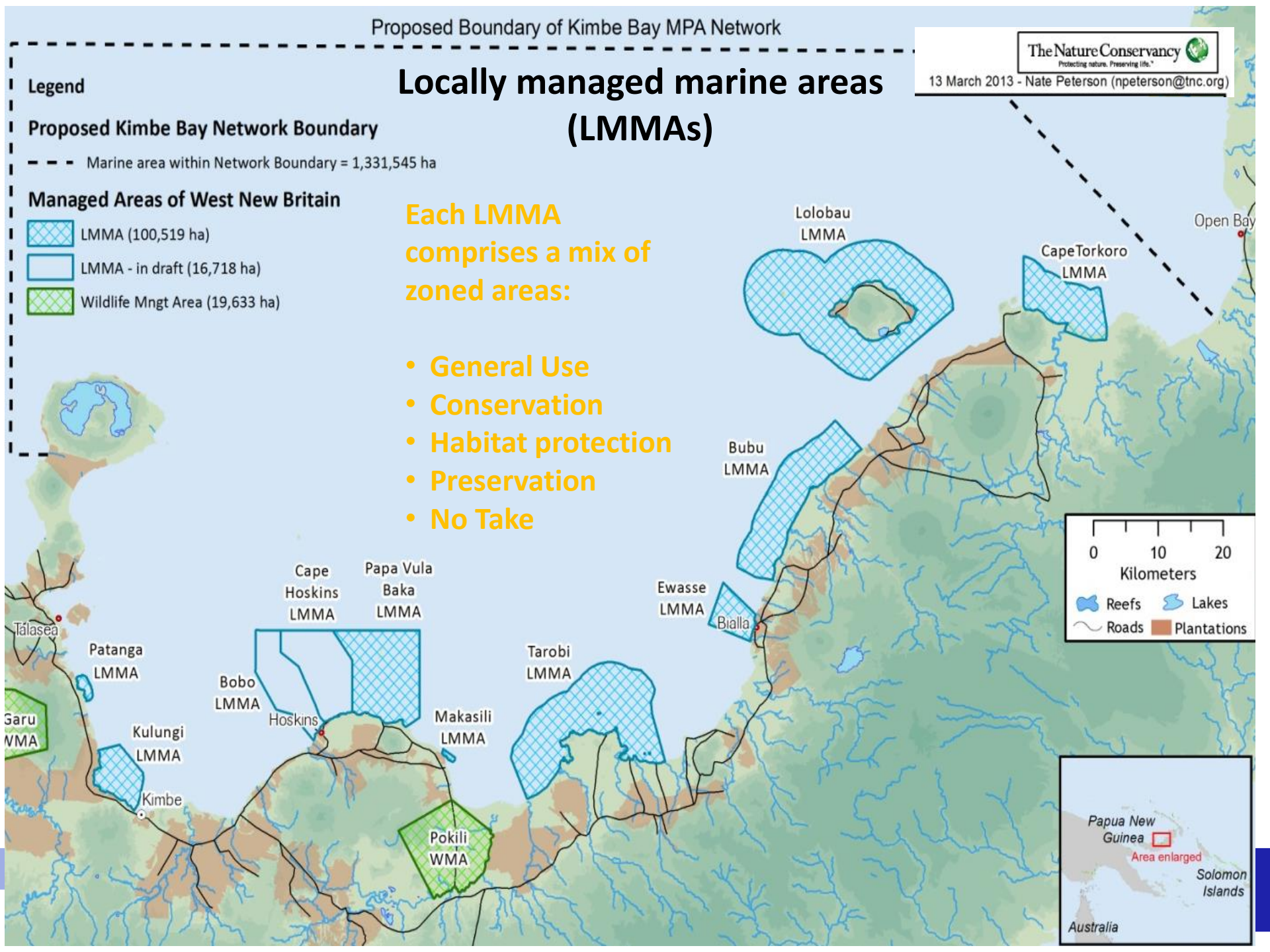
Kimbe Bay: a priority seascape in the coral triangle



CTI = the 'Coral Triangle Initiative' and was established in 2007 with the goal of achieving the co-benefits of biodiversity conservation, sustainable fisheries and food security

Kimbe Bay: a priority seascape in the coral triangle




Proposed Boundary of Kimbe Bay MPA Network
The Nature Conservancy
Protecting nature. Preserving life.
13 March 2013 - Nate Peterson (npeterson@tnc.org)
Legend
Proposed Kimbe Bay Network Boundary
Marine area within Network Boundary = 1,331,545 ha
Managed Areas of West New Britain
LMMA (100,519 ha)
LMMA - in draft (16,718 ha)
Wildlife Mngt Area (19,633 ha)
Locally managed marine areas (LMMAs)
Each LMMA comprises a mix of zoned areas:
General Use
Conservation
Habitat protection
Preservation
No Take
Lolobau LMMA
CapeTorkoro LMMA
Open Bay
Bubu LMMA
Ewasse LMMA
Bialla
Cape Hoskins LMMA
Papa Vula Baka LMMA
Talasea
Patanga LMMA
Bobo LMMA
Hoskins
Garu WMA
Kulungi LMMA
Kimbe
Makasili LMMA
Tarobi LMMA
Pokili WMA
0 10 20
Kilometers
Reefs
Lakes
Roads
Plantations
Papua New Guinea
Area enlarged
Solomon Islands
Australia

LMMA design

LMMAs were designed based on:

- principles of reef resilience and habitat connectivity
- locally-agreed harvesting restrictions and management plans
- legislation developed under local government by-laws
- long-term efforts to build awareness and capacity
- user fees and fines as the financing mechanisms

So, are these LMMAs working?!

- *"…local communities, government and NGOs [in Kimbe Bay] have teamed up to establish marine protected areas in an effort to reduce current pressures (for instance, from overfishing) while bolstering the reef's coral diversity and thus its likely resilience to climate change"*

(Jones et al., 2012; Nature)

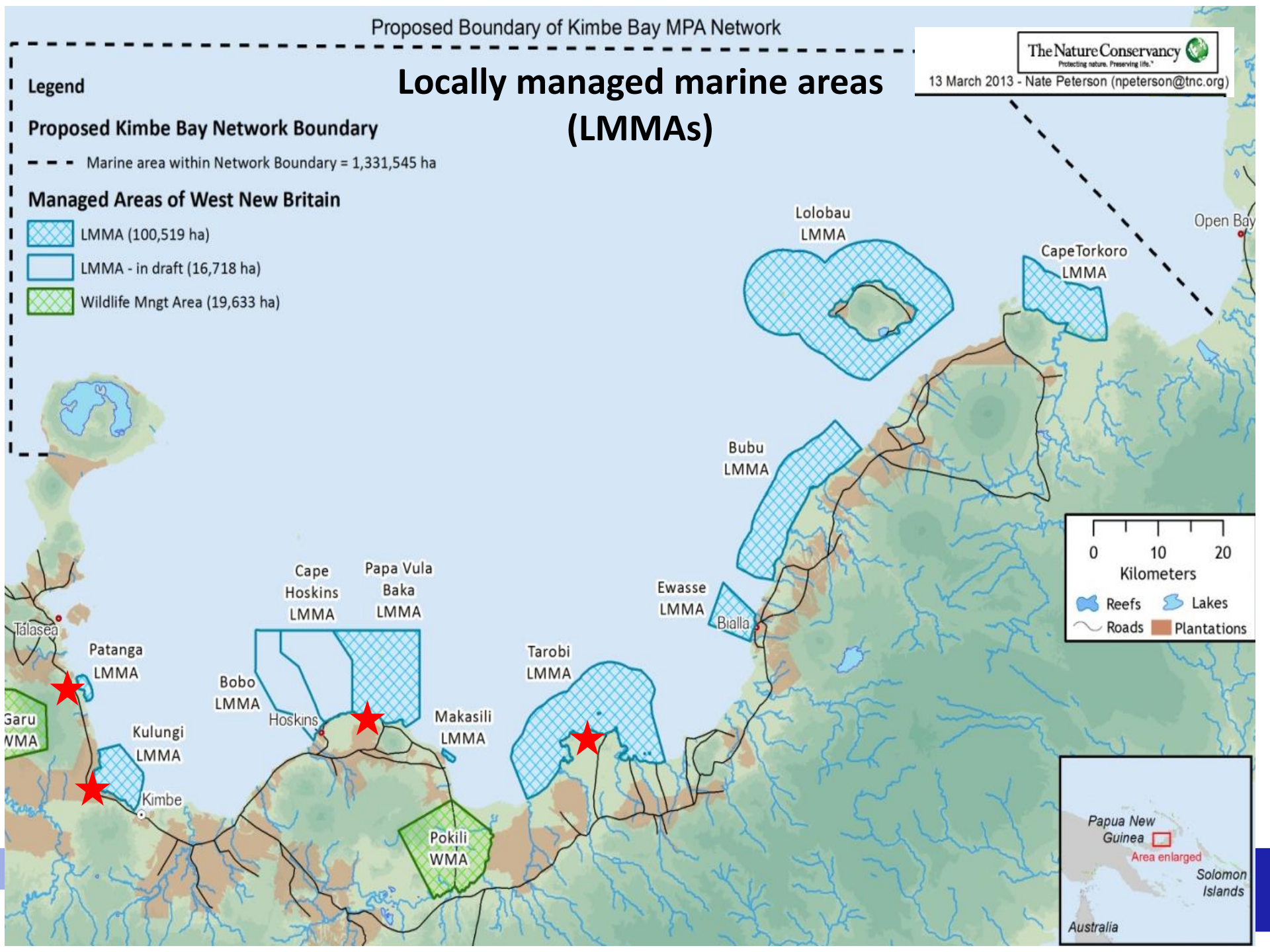
Our observations in 2013 were:

- Not a single LMMA is actively being managed;
- No fees or fines have been collected;
- Many reefs are damaged or bleached, crown of thorns persist, and fish sizes and populations are small

Objectives

1. To get the perspectives of local communities on the effectiveness and status of LMMAs
2. To assess the LMMAs in terms of:
    a. their compatibility with local livelihoods and cultural practices
    b. whether they include all relevant stakeholders and cross-scale threats
3. To identify possible interventions that would contribute to improving LMMA effectiveness and sustainability

Community meetings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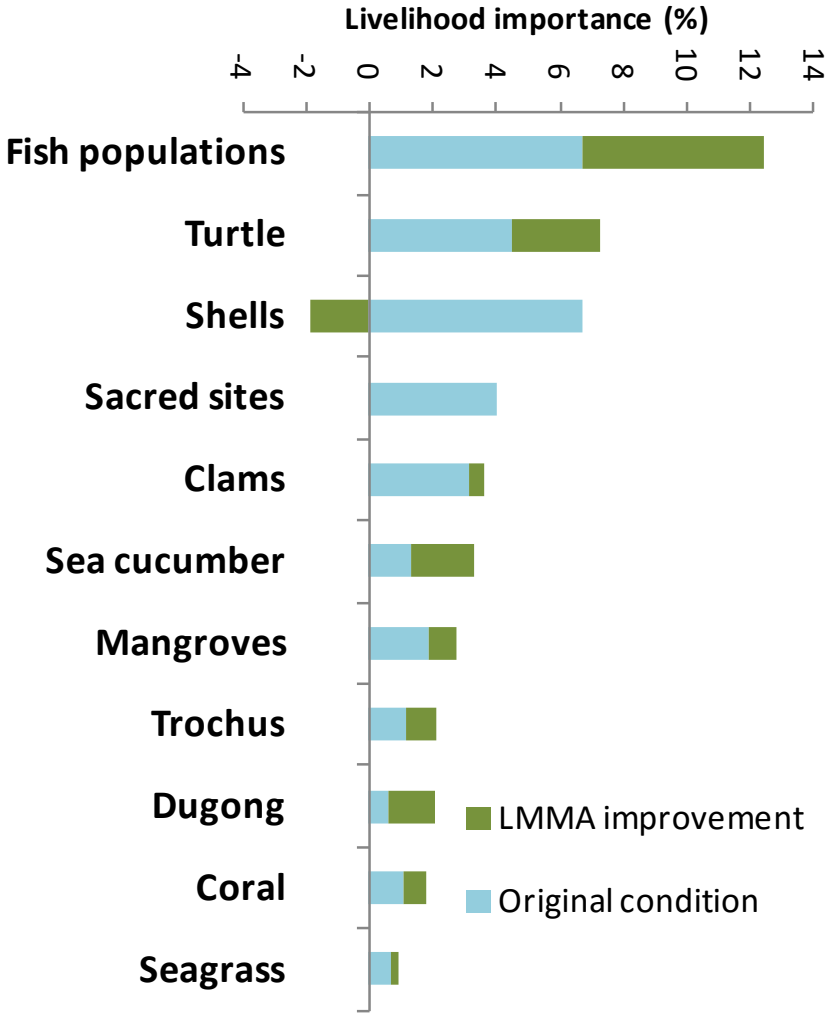
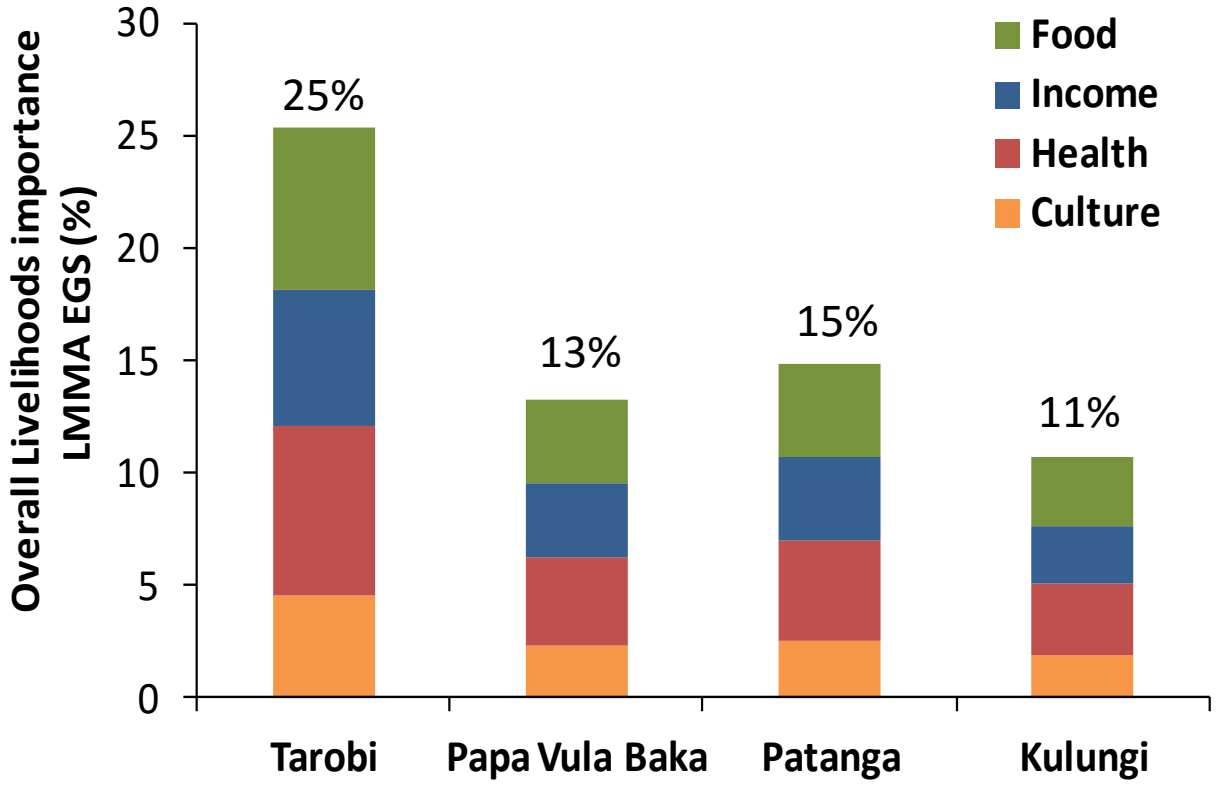
1. Local perspectives of LMMA effectiveness



Participants also highlighted a number of concerns:

1. Limited capacity
2. No fee-paying tourists and “can’t catch illegal harvesters”;
3. Increasing illegal harvesting and demands from growing populations;
4. Increasing run off from oil palm and forest clearing;
5. Rapidly waning enthusiasm since TNC left

2a. LMMA compatibility with livelihoods?



The valuation approach is described in Skewes et al. 2016. *Climate Risk Management*

2a. LMMA compatibility with livelihoods?

LMMA management costs versus fishing Income

LMMA	TOTAL MANAGEMENT COST* ($ PER YEAR)	TOTAL FISHING INCOME ($ PER YEAR)
Tarobi	$10,500	$12,500
Papa Vula Baka	$18,700	?
Patanga	$1,950	$9,750
Kulungi	$14,500	$26,000

*Management costs include labour and fuel for surveillance and monitoring

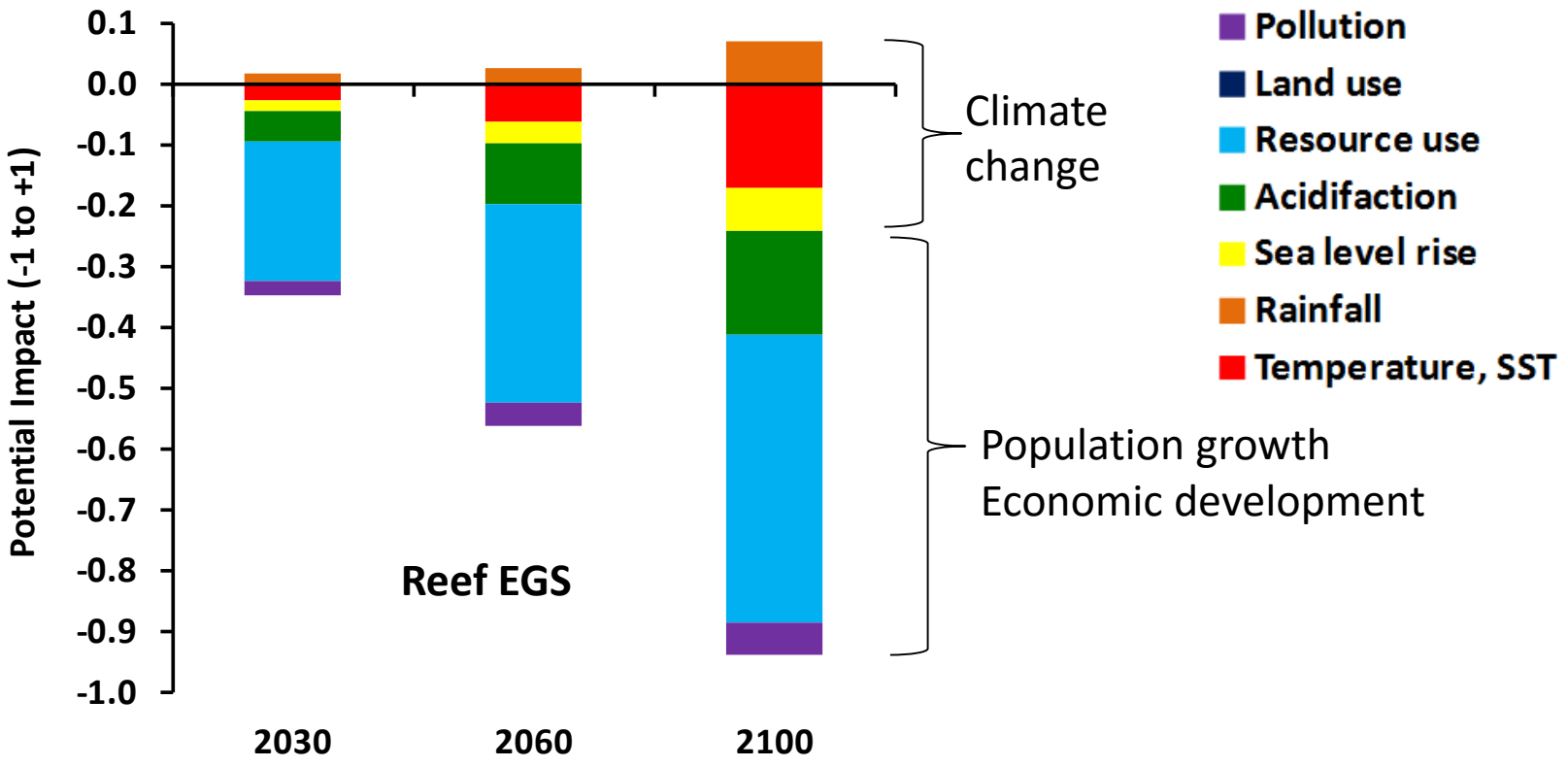
- Most, if not all, of this income is used to pay for health, education, mobile phones, staples such as rice, and energy

2b. LMMA's account for all stakeholders?

Beneficiaries of LMMAs

BENEFICIARY	BENEFITS				
	DIRECT USE	INDIRECT USE	DIRECT NON-USE	INDIRECT NON-USE	RELATIVE MAGNITUDE (0-5)
Local rural communities (resource owners)	Food; Income (fish, shellfish, beche-de-mer); Recreation	Nil	Tourism income; Cultural; Protection; Education	Existence; Option; Adaptation	4
Local rural communities (resource purchasers)	Recreation	Food (fish, shellfish)	Education	Cultural	2
Local urban community (resource purchasers)	Recreation	Food (fish, shellfish)	Education	Nil	1
Local urban community (resource poachers)	Food; Income (fish, shellfish, beche-de-mer); Recreation	Nil	Nil	Nil	2
National / international communities	Recreation (diving, snorkelling, fishing);	Food (fish, shellfish)	Aesthetic; Research; Education	Existence; Option	3

2b. LMMA's include cross scale threats?



Summary

1. LMMAs have led to ecosystem improvements but no longer managed

2. LMMAs are inappropriately designed as closed systems assuming:
   - resource owners have agency and influence
   - cross-scale effects are negligible or out of scope

3. The existing financing mechanisms are not working:
   - Communities will not fine each other for breaches of the rules
   - There are no fee-paying tourists
   - Incomes generated are insufficient to cover costs

4. The international community is a beneficiary contributes little directly to LMMAs

Recommendations

1. External interventions are needed that account for cross-scale influences on coastal ecosystems
2. Existing governance of LMMAs needs to include a wider set of actors and incentive mechanisms:

Actors	Incentive mechanism
• Oil palm • Forestry	• Corporate social responsibility • RSPO scope widened beyond farm gate • Pollution and sediment run-off charges
• Global Agencies representing biodiversity values	• PES-type programs • Targeted, local-scale funding
• Higher-levels of government	• Recognition for livelihoods benefits from coastal development, sustainable LMMAs, capacity building & population control


Photo by Tim Skewes


Photo from coraltriangleinitiative.org

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Thank you

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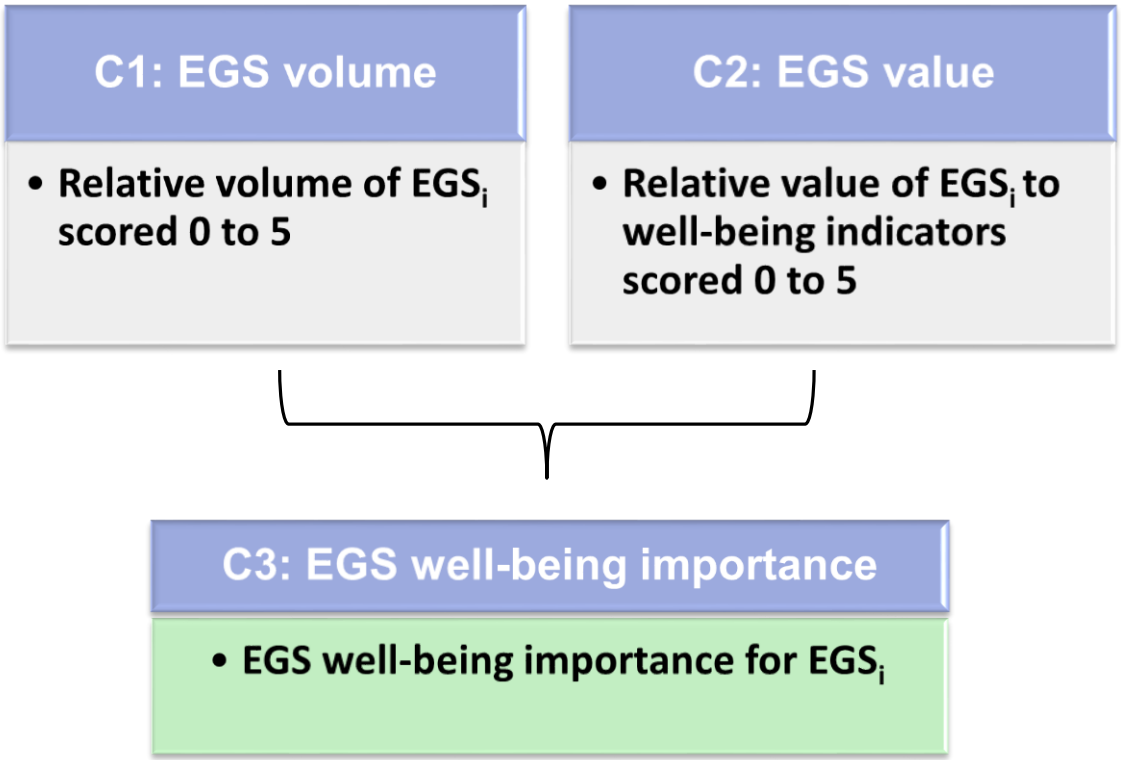
2a. LMMA compatibility with livelihoods

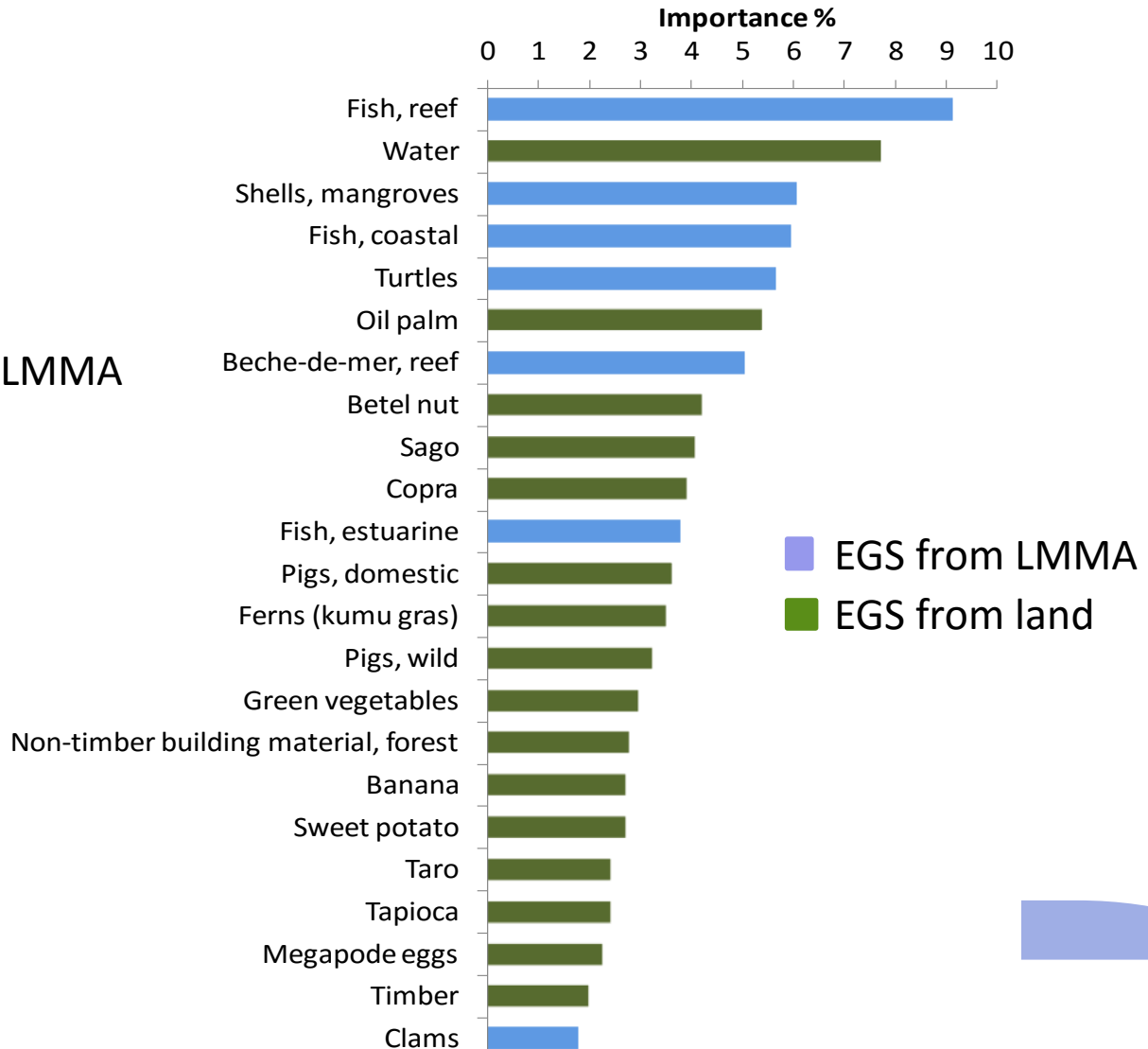
Local livelihoods' dependence on LMMAs ecosystem goods and services (EGS)?



2a. LMMA compatibility with livelihoods

Local livelihoods' dependence on LMMAs?

Tarobi LMMA



2b. LMMA's account for all stakeholders?

Future beneficiaries and values of LMMAs

Understanding of human preferences for an ecological feature tells us:

- the scarcer it is, the greater its value;
- the scarcer are substitutes, the greater its value;
- the more abundant are complements, the greater its value;
- the larger and better off the population benefiting, the greater its value;

DRIVERS OF CHANGE	BENEFICIARIES	DETERMINANTS AND INFLUENCE ON VALUE				
		SCARCITY	SUBSTITUTES	COMPLEMENTS	WEALTH	NET EFFECT
Economic development	Local	⇧	⇩	⇧	⇧	+++
	Non-local*	⇧	⇧	⇧	⇧	++++
Population growth	Local	⇧	?	⇧	⇧	++
	Non-local*	⇧	?	⇧	?	+
Climate change	Local	⇧	?	⇧	⇧	++
	Non-local*	⇧	?	⇧	?	+