Understanding and Valuing the Marine Ecosystem Services of the Northern Mozambique Channel

A study commissioned by WWF International, conducted by:

- Paulo A.L.D. Nunes (TEEB and WAVES – Wealth Accounting and Valuation of Ecosystem Services)
- Andrea Ghermandi (University of Haifa)
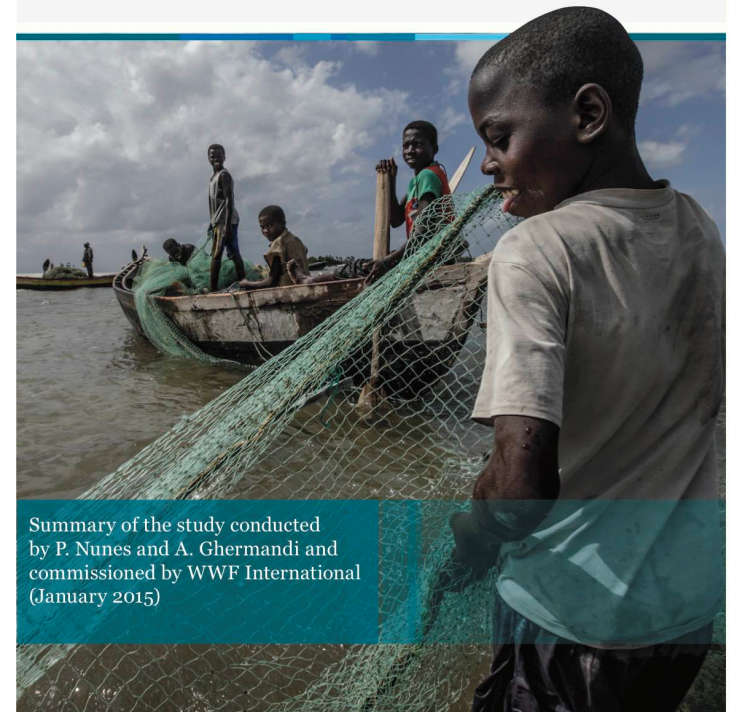
Full report and summary at:
www.cordioea.net/nmc
www.panda.org/marine/nmc

Presented by David Obura

CORDIO East Africa, NMCi Core Team

UNDERSTANDING AND VALUING MARINE ECOSYSTEM SERVICES IN THE NORTHERN MOZAMBIQUE CHANNEL

Summary of the study conducted by P. Nunes and A. Ghermandi and commissioned by WWF International (January 2015)

Prepared by WWF and CORDIO.

Blue economy:

"The Blue economy is Africa's future" - African Union (AU) Agenda 2063

Twitter definition - a #blue/#greeneconomy achieves #socialwellbeing, #economicgrowth and #environmentalsustainability jointly #NairobiConvention #NCCOP8 (@dobura)

Of particular importance/value for small island states and coastal zones/economies

But, in the rush to development and securing ocean wealth, a very real risk that 'wealth' is the only focus, rather than sustainability and social goals.

US$24TN

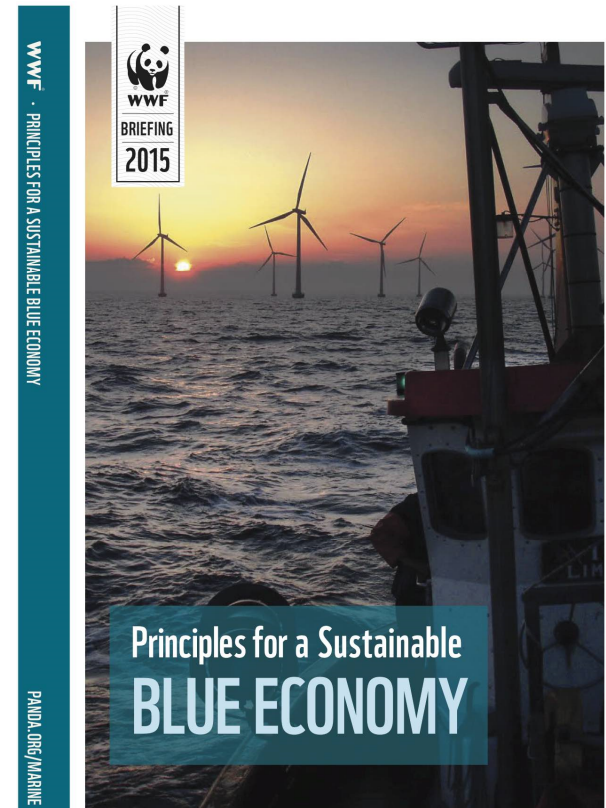The overall value of key ocean assets is more than US$24 trillion

2050

At current rates of temperature rise, coral reefs will disappear by 2050

7TH

Based on the gross marine product, the ocean is the 7th largest economy in the world

WWF · BRIEFING 2015
WWF · PRINCIPLES FOR A SUSTAINABLE BLUE ECONOMY
Principles for a Sustainable **BLUE ECONOMY**
PANDA.ORG/MARINE

REVIVING THE OCEAN ECONOMY

2/3

Two-thirds of the base economic value of the ocean is produced by assets that rely on healthy ocean conditions

Background:

Ecosystem service valuation
- Attempt to account for nature in monetary/economic terms
- But a significant problem of many ecosystem functions and services not being easily quantified in such terms

Important milestones
- Millennium Ecosystems Assessment (MEA), 2005
- The Economics of Ecosystems and Biodiversity (TEEB), 2007
- Natural Capital Accounting (NCA)
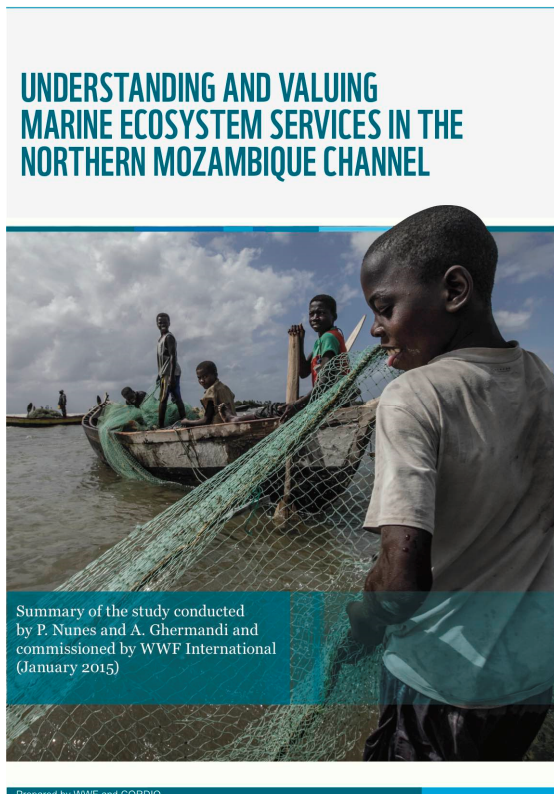
- Development of multiple tools, first presentation.

Data and sources
- Often there is no direct data, so indicators/proxies need to be developed
- The spatial and temporal resolution of data may be poor or unsuitable
- Heterogeneity of data types and sources
- These issues are compounded at the regional level, due to multiple countries and sources of information

Northern Mozambique Channel –

See Background Document (2015)

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MARINE ECOSYSTEM SERVICES IN THE
NORTHERN MOZAMBIQUE CHANNEL

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Box 1. Facts and figures on the Northern Mozambique Channel.

Nature
- Contains 35 % of Indian Ocean coral reefs
- Contains 5% of world's mangrove forests
- Is the 2nd peak in biodiversity of hard coral species
- Is a key corridor for humpback whales
- is on the migration route of WIO tuna and tuna-like species
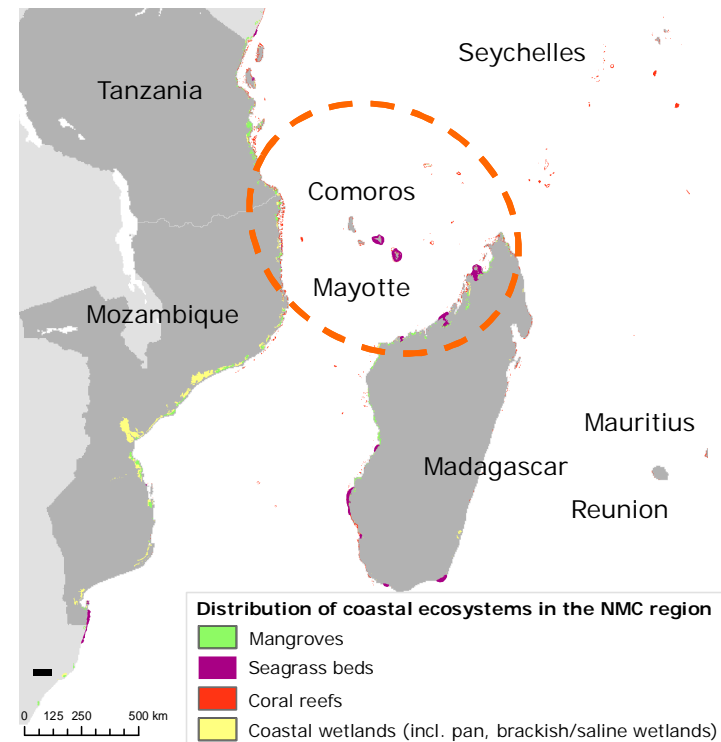- contains large carbon sinks (seagrasses, mangroves, coastal wetlands)

Economics
- marine resources account for approximately 5% of GDP in small Island States.
- small-scale artisanal and subsistence fishers account for 70-80% of total catches.
- NMC provides a significant part of WIO tuna fisheries ($2 billion/yr)
- NMC supports industrial fishing/mariculture of growing importance
- tourism is among fastest growing sectors/high potential (11% annual growth in Madagascar, annual arrivals)
- NMC holds natural gas reserves, over 100 Tcf (trillion cubic feet) as currently known
- NMC supports 30% of global tanker traffic, over 5000 tanker-trips annually

Geography
- is home to 10 million people in the coastal zone
- Is bordered by 6 coastal states and comprised of Exclusive Economic Zones (EEZ) only (no areas beyond national jurisdiction)

Six services examined:

Category	Services
Provisioning	Large scale fishing
	Artisanal fishing
	Mariculture
Cultural	Coastal tourism and recreation
Regulating	Carbon sequestration
	Coastal erosion prevention

Distribution of coastal ecosystems in the NMC region
- Mangroves
- Seagrass beds
- Coral reefs
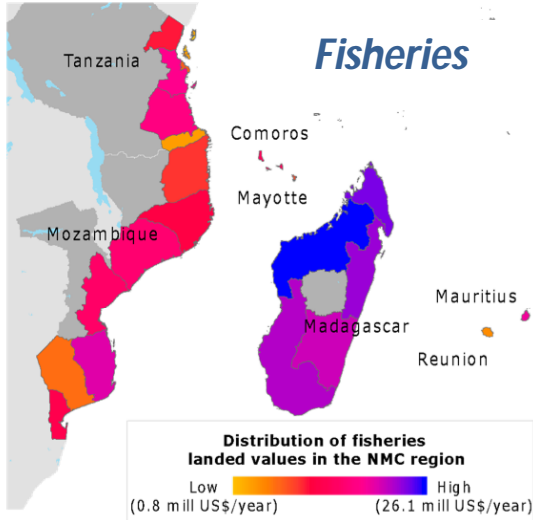- Coastal wetlands (incl. pan, brackish/saline wetlands)

Data Sources (2 examples):

- International tourism flows, United Nations World Tourism Organization (UNWTO). By province, 2001-2011.

- Modelling – estimating ES value from values measured for a habitat at specific locations, or in the literature (e.g. coral reef fishery catch), and extending those over mapped habitat layers (e.g. coral reef extent) in a GIS.
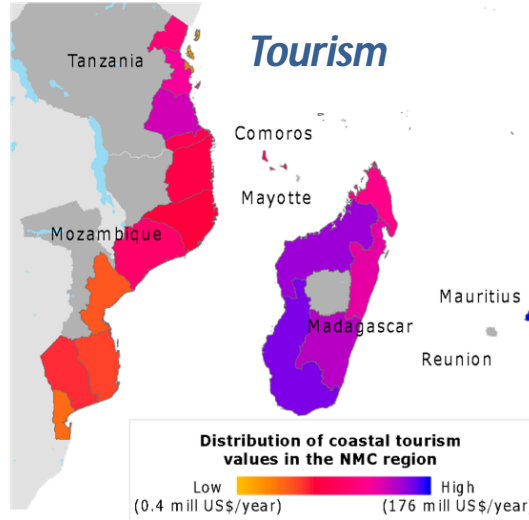
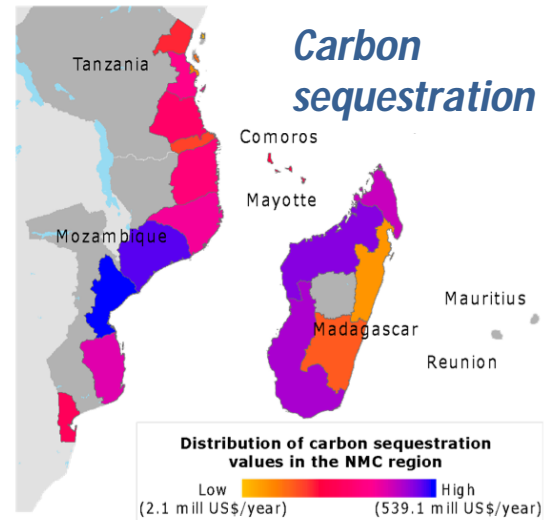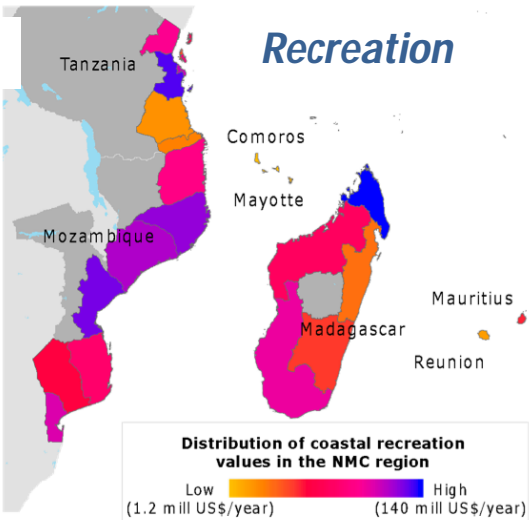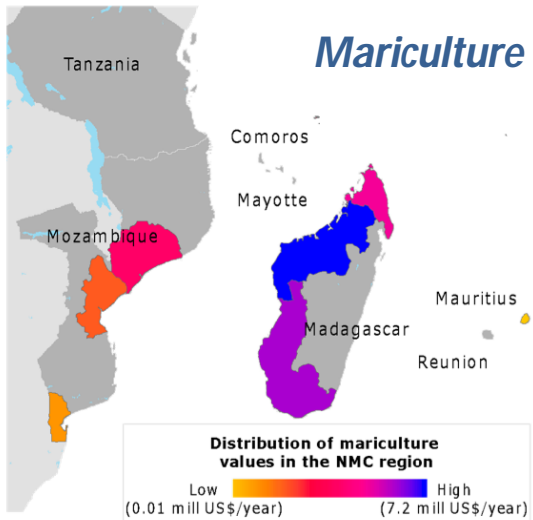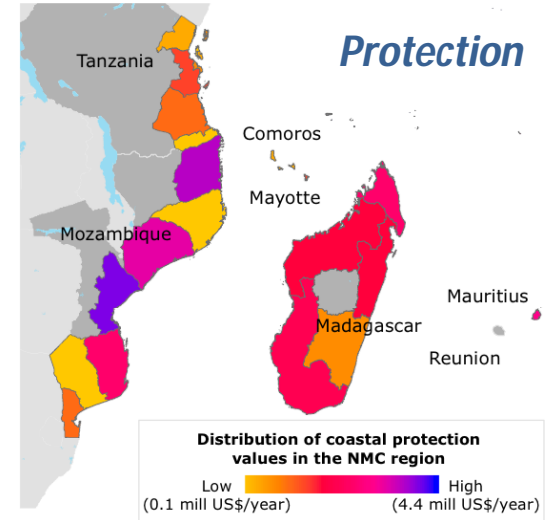# 'Province' level estimation of value:
- Units in millions of US$ per year

Provisioning services

Fisheries

Distribution of fisheries landed values in the NMC region
Low (0.8 mill US$/year) — High (26.1 mill US$/year)

Mariculture

Distribution of mariculture values in the NMC region
Low (0.01 mill US$/year) — High (7.2 mill US$/year)

Cultural services

Tourism

Distribution of coastal tourism values in the NMC region
Low (0.4 mill US$/year) — High (176 mill US$/year)

Recreation

Distribution of coastal recreation values in the NMC region
Low (1.2 mill US$/year) — High (140 mill US$/year)

Regulating services

Protection

Distribution of coastal protection values in the NMC region
Low (0.1 mill US$/year) — High (4.4 mill US$/year)

Carbon sequestration

Distribution of carbon sequestration values in the NMC region
Low (2.1 mill US$/year) — High (539.1 mill US$/year)

'Province' level estimation of aggregate value:

Legend

Millions of US$ per year

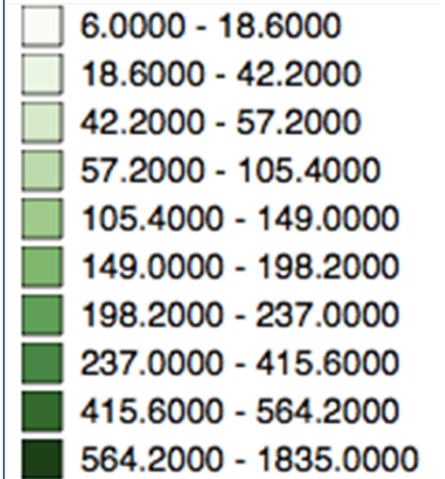|	
	6.0000 - 18.6000
	18.6000 - 42.2000
	42.2000 - 57.2000
	57.2000 - 105.4000
	105.4000 - 149.0000
	149.0000 - 198.2000
	198.2000 - 237.0000
	237.0000 - 415.6000
	415.6000 - 564.2000
	564.2000 - 1835.0000

'Province' level estimation of aggregate value:

Legend
Millions of US$ per year

	6.0000 - 18.6000
	18.6000 - 42.2000
	42.2000 - 57.2000
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	105.4000 - 149.0000
	149.0000 - 198.2000
	198.2000 - 237.0000
	237.0000 - 415.6000
	415.6000 - 564.2000
	564.2000 - 1835.0000

Ecosystem service

Protection	
Sequestrat	
Recreation	
Maricultur	
Tourism	
Fisheries	

Modeled value, based on habitat distribution (and state)

Distribution of coastal ecosystems in the NMC region
- Mangroves
- Seagrass beds
- Coral reefs
- Coastal wetlands (incl. pan, brackish/saline wetlands)

0 125 250 500 km

Fisheries

Landed value from fisheries in the NMC region

Low (2.4 US$/km2/year) — High (524.4 US$/km2/year)

Recreation

Coastal recreation value

Low (7.2 I$/ha/year) — High (1909.7 I$/ha/year)
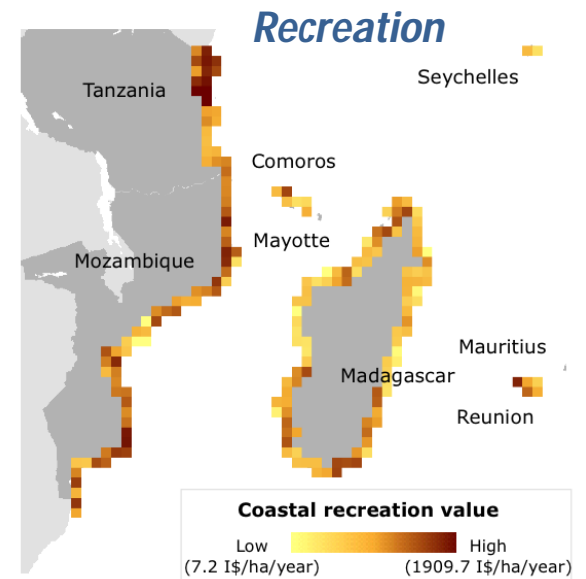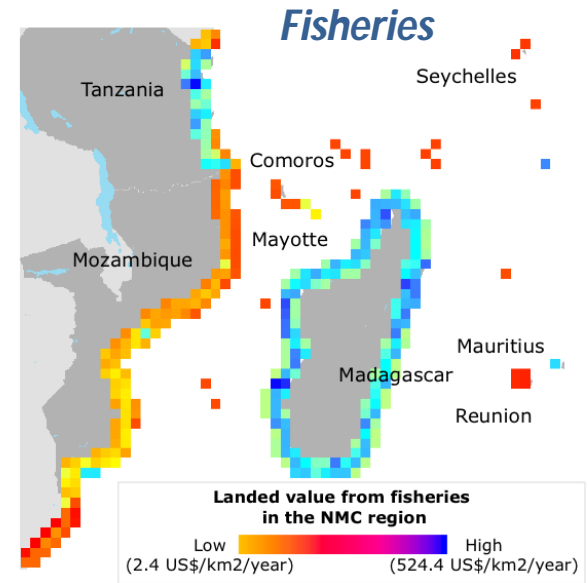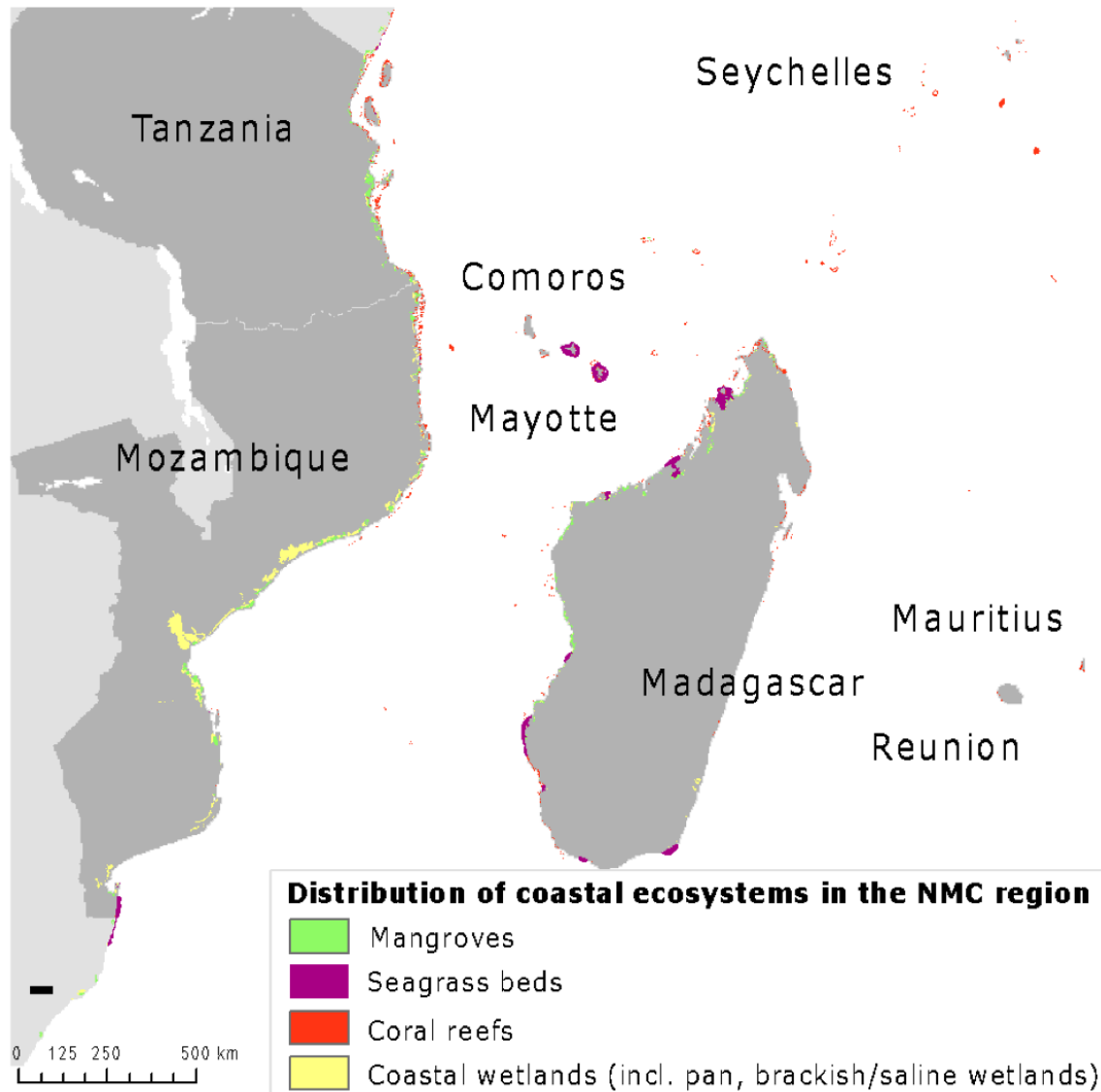
*Some discrepancies in the two data sources –
literature/data sources vs. modeled values*
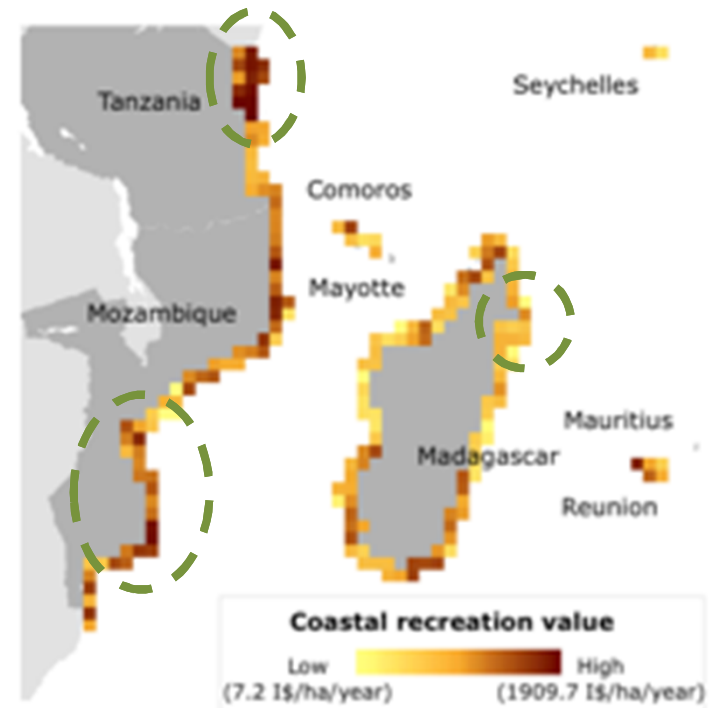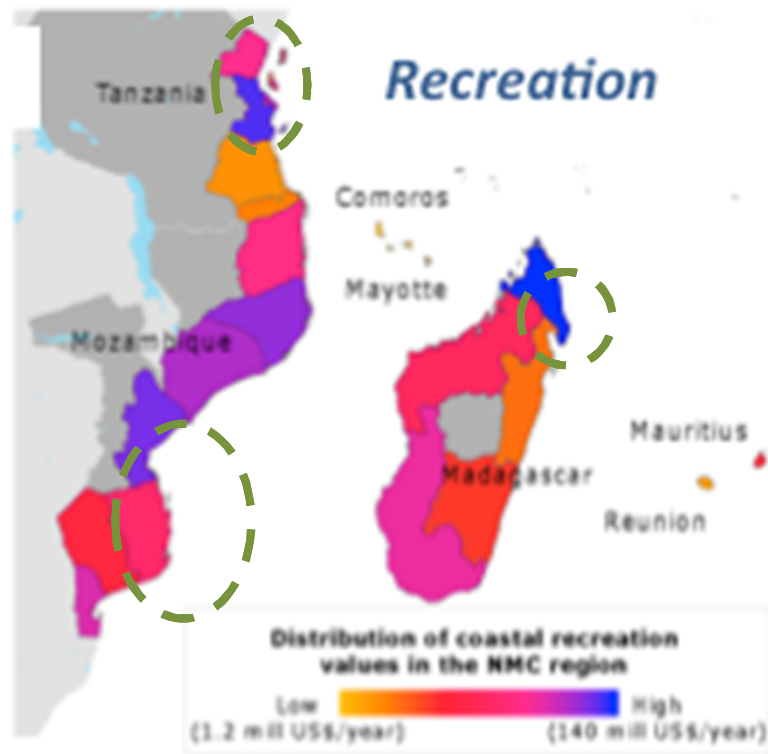
Monetary vs.social components of economic value ...

Box 3. Economic value of small-scale fisheries, Velondriake, Madagascar

The fishery:
- 5,524 metric tons of fish and invertebrates
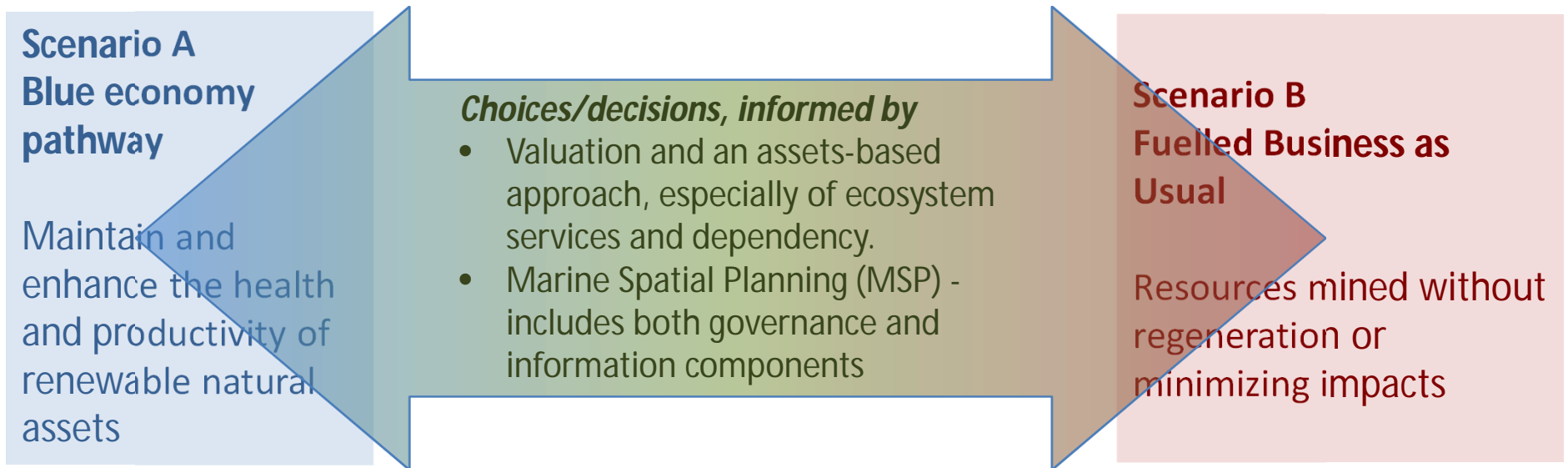- coral reef ecosystem

Economic value:
- 83% was sold in the markets
- Annual revenue of nearly 6.0 million USD (2010, PPP)
- estimated annual value of $6.9 million USD (2010, PPP)

Social value:
- **employs 87% of the adult population**
- **Generates 82% of all household income,**
- **provides the sole protein source in 99% of all household meals with protein.**

Source: Barnes-Mauthe M, Oleson KLL, Zafindrasilivonona B (2013)

Delivering a Blue Economic approach - Ocean governance

Scenario A
Blue economy pathway

Maintain and enhance the health and productivity of renewable natural assets

Choices/decisions, informed by
- Valuation and an assets-based approach, especially of ecosystem services and dependency.
- Marine Spatial Planning (MSP) - includes both governance and information components

Scenario B
Fuelled Business as Usual

Resources mined without regeneration or minimizing impacts

Recommendations (for conclusions from this workshop to Science to Policy meeting):
1. Cooperation across countries essential (Conventions, SDGs, etc)
2. More consistent and finer resolution data (e.g. from inventories of natural assets/capital) needed for Ecosystem Service valuation.
3. Address priority sectors/fill gaps with initial investment (funding)
4. Use ES valuation as a basis for investment/development/impact choices – e.g. investment funds.
5. Develop Marine Spatial Planning (MSP) as a foundation for decision-making, as well as for information processing, including of ES valuation results