Why Countries are Constructing Ecosystem Accounts

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1. Simple approach to ecosystem accounting in the Netherlands and Zanzibar
2. Ecosystem accounting for non-market ecosystem services and externalities in Australia
3. Pilot ecosystem accounts in WAVES' countries: India and the Philippines

1. Ecosystem accounts: Netherlands and Zanzibar

….a simple approach for (mostly) market goods and services

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Netherlands: economic accounts for the North Sea

Reporting under the EU Marine Strategy Framework Directive

		Employment, thousand FTE	Value-added, million euros
Dutch Continental Shelf (1 large area)			
	Shipping	0.2	37
	Fisheries	0.2	45
	Oil & Gas	0.8	5,866
	Sand	na	na
	Wind power	na	11
	Total	1.2	5,959
Coast (1 mile behind shoreline) & 5 Seaports		110.4	13,852
TOTAL		**111.6**	**19,811**

Netherlands: spatial scale and information needed

3 large spatial zones, no detailed land accounts needed:

- Off-shore, 200 mile EEZ
- 5 Seaports
- 1 mile coastal zone

No other ecosystem services;

Study largely led by Statistics Netherlands

Zanzibar: marine and coastal ecosystem accounts

Managing development of fragile coastal environment for sustainable growth and poverty reduction—

- What are the (dis)incentives for sustainable management faced by local communities, government and others?
  - Overfishing affects fish stocks and coral reefs
  - Untreated waste water and ocean health (fisheries, coral reefs)
  - Beach erosion
  - Uncontrolled cutting of mangroves
  - Climate change—coral bleaching
- Does tourism benefit local communities? How can benefits be increased

Employment, contribution to GDP, and distribution of income by stakeholder group for

- Tourism, fishing, seaweed farming, mangrove harvesting
- Land accounts for the shoreline--access to shoreline by different stakeholders and incomes generated

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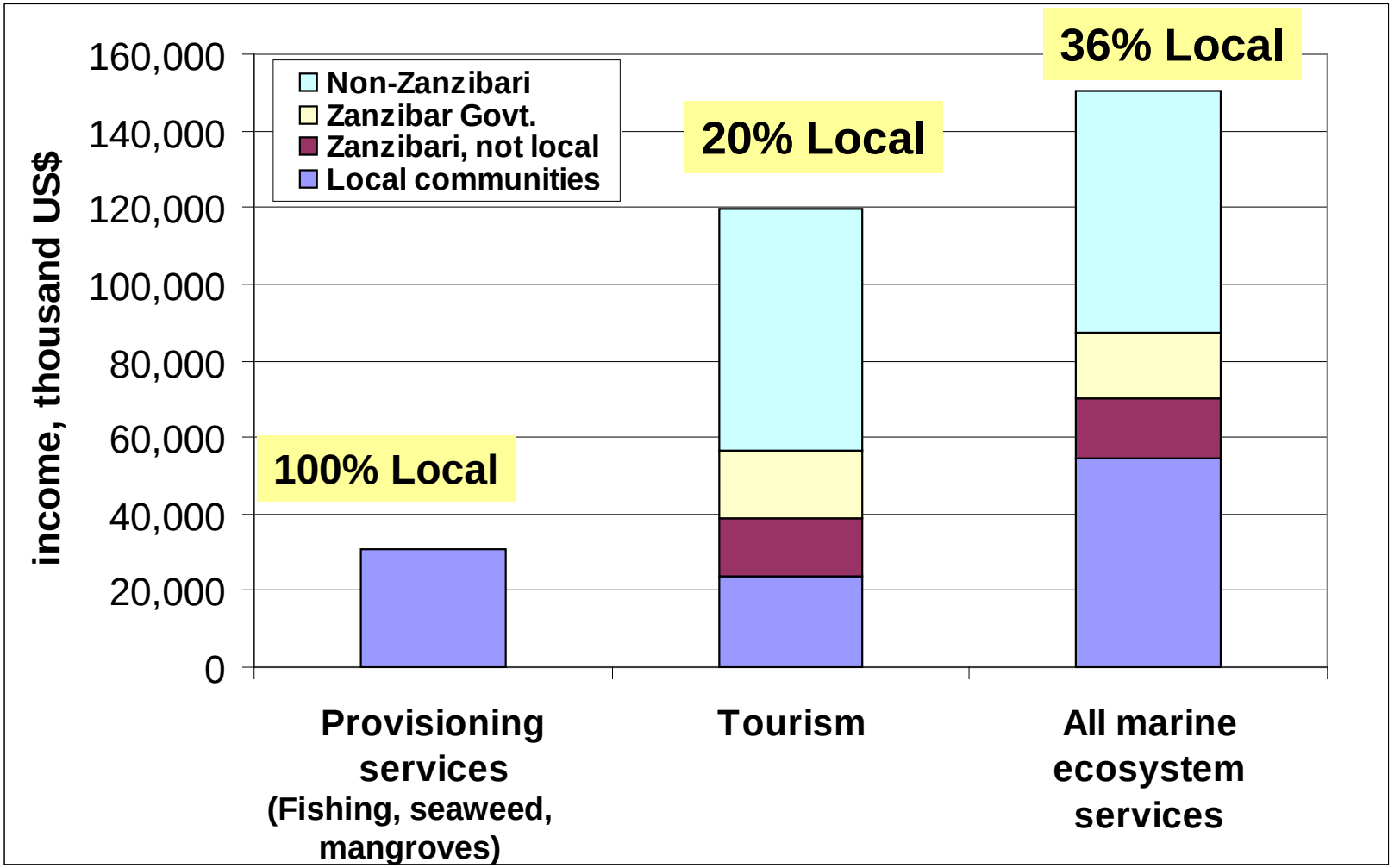
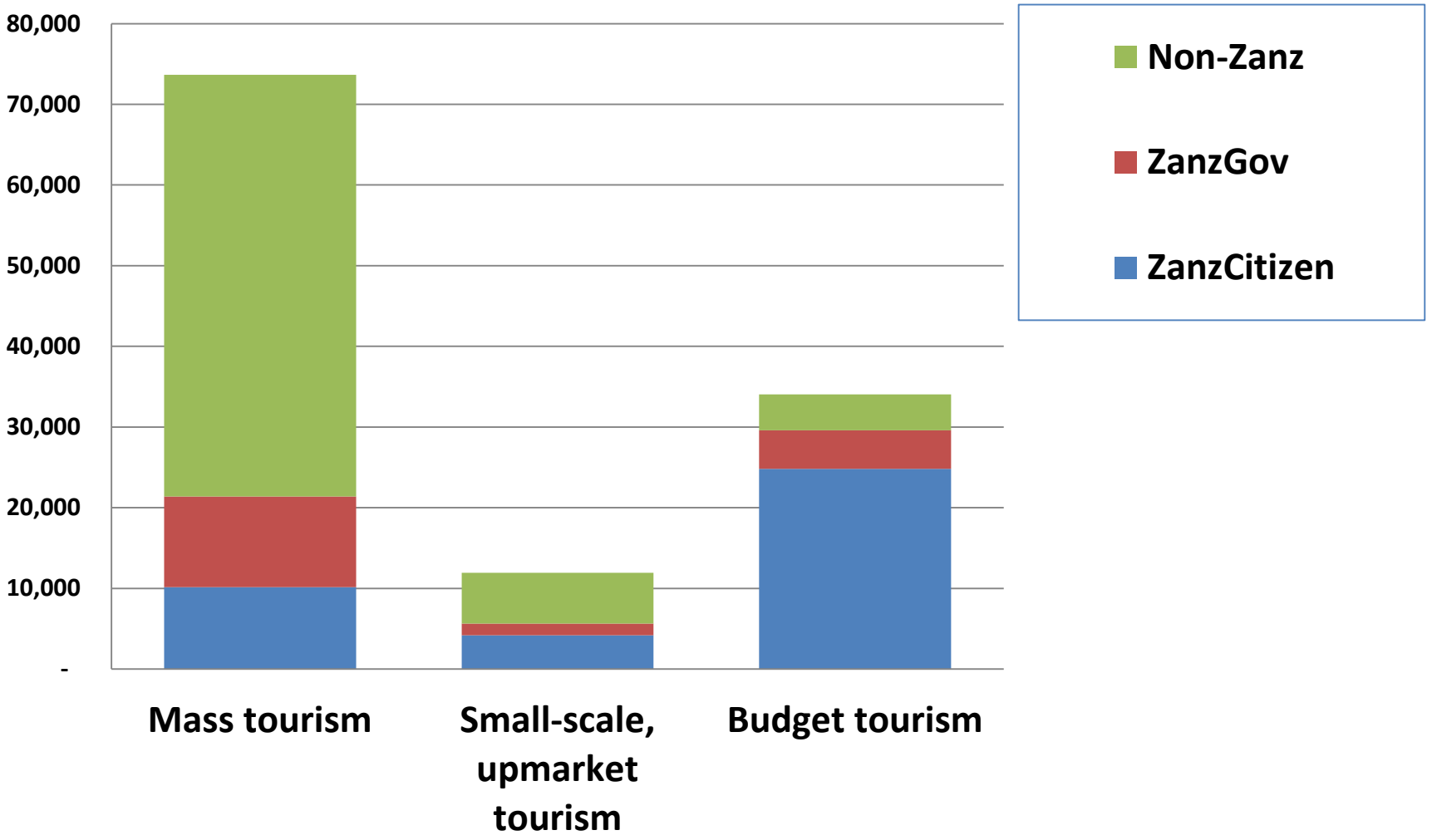
Marine & coastal ecosystem services

Contribution to GDP = 30%

Benefits to local communities vary a great deal!

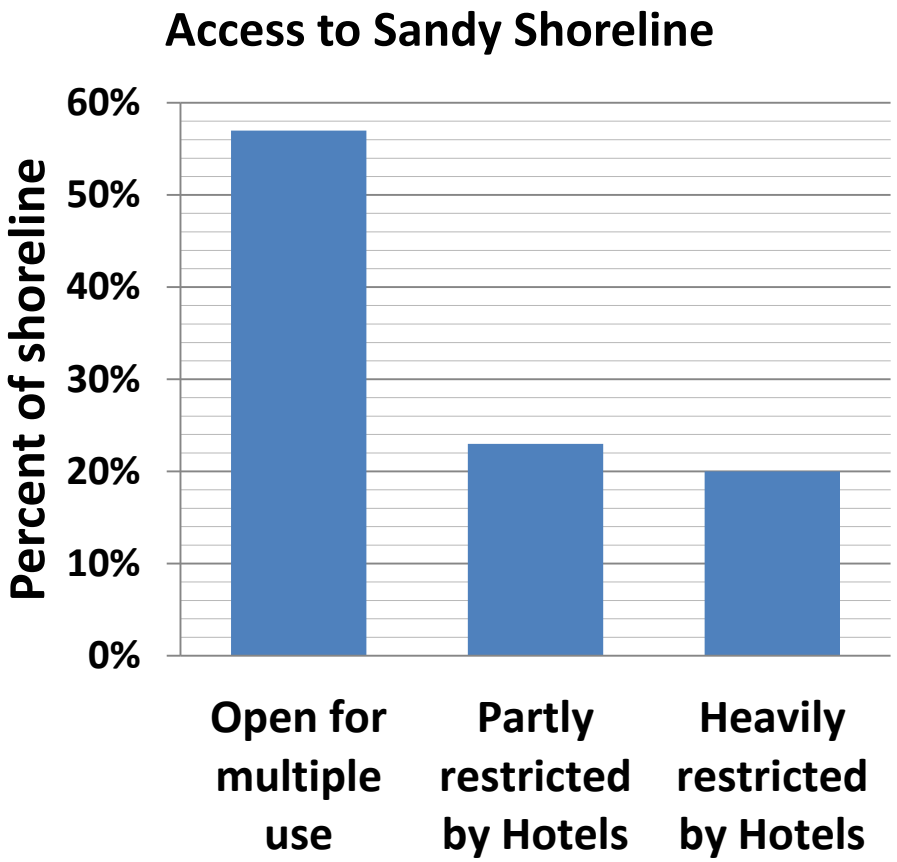


Tourism Industry: Income for different Stakeholders (US$ thousand)



Access to Shoreline for Livelihoods:

potential conflict between local communities and tourism



Shoreline classified as

- Sandy (106 km),
- Rocky/Cliff (135 km)
- Mangrove (164km)
- Urban/Industrial (2 km)
- River estuary (<1 km)

Usable shoreline limited to **sandy shoreline.**

Economic activity mapped to 5 regions (and tourism to 23 subregions).

Zanzibar: spatial scale and information needed

Spatial disaggregation for economic & shoreline accounts:

5 regions with 20 Districts

Study largely led by University (Institute of Marine Sciences) in cooperation with relevant ministries

2. Ecosystem accounts:

….taking into account non-market ecosystem services and ‘externalities’ like pollution and soil erosion

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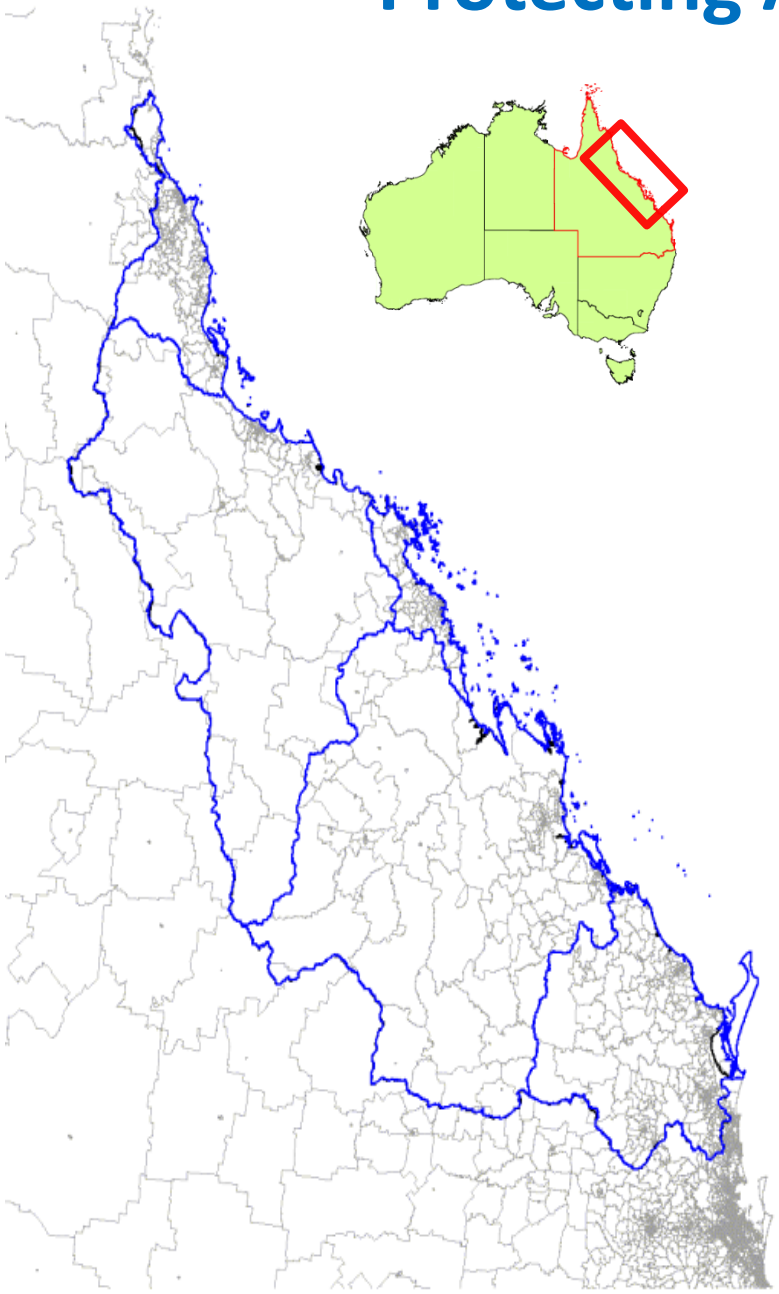
Protecting Australia's Great Barrier Reef



Major asset, source of income and jobs from:

- **Tourism**
- **Fishing industry**

Coral reef managed well-- protected from overfishing, overuse by tourism

BUT,

Major threats from *on-shore activities*— sediment, pollutants (phosphorus, nitrogen) mainly from Agriculture, partly from coastal development

Ecosystem Accounts: linking land use to water quality impacting Great Barrier Reef

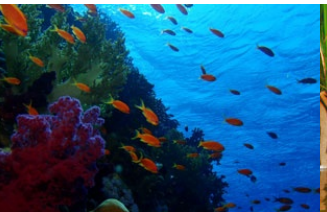
	Total suspended solids	Total nitrogen	Total phosphorus	PS11 herbicides
Natural Resource Mgmt Region	ktonnes/yr	tonnes/yr	tonnes/yr	kg/yr
Cape York	2388	2998	1516	n/a
Wet Tropics	1360	4400	2037	10054
Burdekin	4738	2446	2555	4911
Mackay-Whitsundays	1542	912	2172	10019
Fitzroy	4109	1672	4142	2269
Mary Burnett	3076	1463	3092	990
Total GBR region	17213	13891	15514	28243

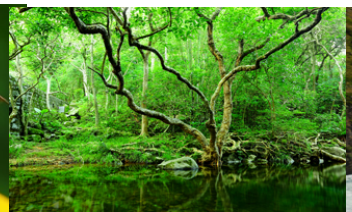
Land use in the watershed:

- agricultural practices and land use:
  - land characteristics
  - agricultural practices (crop, tilling, agr chemical use)
- resulting runoff of sediment & chemicals
- number of jobs and income affected

(also urban, industrial land use & economic activities)

Prioritize areas to target for improved land management

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Great Barrier Reef: spatial scale and information needed

Key Stakeholders:

- Queensland State Dept of Environment and Resource Management and
- Great Barrier Reef Marine Park Authority

Data:

- **Parcel-level data for land use** from cadastre linked to economic information from national business register from ABS and agricultural water use estimated from ABS water accounts
- Agriculture practices from national farming surveys
- Modelling of pollution and sediment runoff done by research group

Key agencies involved:

Government

- Queensland State Dept of Environment and Resource Management
- Dept of Agriculture Forestry and Fisheries
- Great Barrier Reef Marine Park Authority

Research agencies

- Centre for Tropical Freshwater Research
- CSIRO

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3. Pilot ecosystem accounts in WAVES countries: India and the Philippines

Watershed land management for water quality in Himachal Pradesh, India

Hydropower = 100% of electricity, and major expert of HP

But hydro faces threat from **high sediment runoff** due to current land use (clogs turbines/fills dams)

India has mandated **Payment for Environmental Services (PES)** schemes to improve land management for water quality Implementation requires:

- estimate value of soil retention service,
- set payments for land use change to promote soil retention, and
- identify priority areas for payments where sediment control is greatest.

But they lack information…Watershed ecosystem accounts will provide this information:

- forested land cover & use (land cover, slope, rainfall, etc.),
- Water flow regulation and soil retention/sediment runoff (modeled)
- Value of current economic activities in the watershed and how they might be impacted by change in land use

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Philippines Ecosystem Pilot 1. Southern Palawan province

Allow mining or not? If mining is allowed, which sites?

(led by Palawan Council for Sustainable Development)

Construct **Land & Seascape Accounts** to map current economic activities, focusing on those likely to be affected by mining

- Agriculture: commercial and subsistence
- Forests: logging (legal and illegal) and use of protected areas for gathering foods, medicines, etc by indigenous peoples
- Tourism
- Coastal Fisheries
- Urban water supply

Map potential mining sites and model potential impact on environment, economy and livelihoods from loss of land, **water pollution & sediment runoff** (water, soil erosion water pollution accounts)

- Are there areas with minimal impact?
- How can local communities be compensated for impacts of mining?
- Is the agreement for sharing revenue from mining with local communities sufficient?

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Philippines Ecosystem Pilot 2: Laguna Lake Basin—serving the capital of Manila

(led by Laguna Lake Development Authority)

Laguna Lake provides Manila with

- Water supply -- Fishing (capture & aquaculture) -- Recreation and tourism -- Storm buffering

BUT, Laguna Lake receives Manila's wastewater/pollution, and heavy sediment runoff from watershed land use, affecting water quality and the depth of the lake

- High cost for treating municipal water supply and treating wastewater
- reduced ability to buffer pollution and storms (climate change makes this worse)
- Negative impact on fisheries, tourism

Immediate issues for ecosystem accounts (next year)

- Water tariffs – **water accounts**
- Setting fees for wastewater effluent from industry – **wastewater/pollution accounts**

Medium term issues

- Management of competition between capture fisheries and aquaculture—'land' accounts for lake area, fish stocks and fish catch
- Land management in the lake basin to reduce siltation—land use accounts and forest accounts

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