

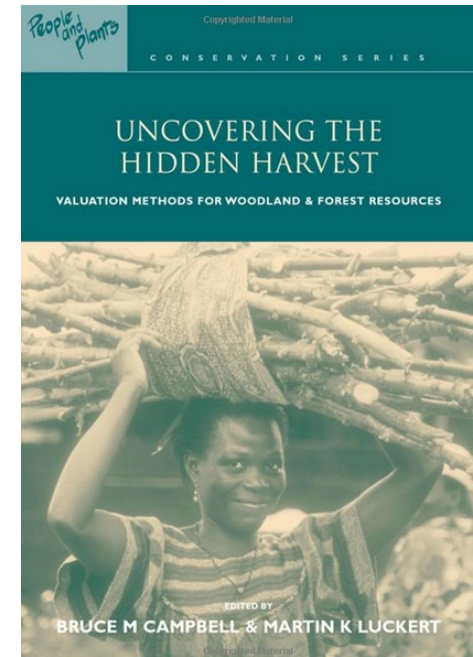
The contribution of ecosystem services to poverty alleviation in rural and urban sites?

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Why are we interested in environmental income?

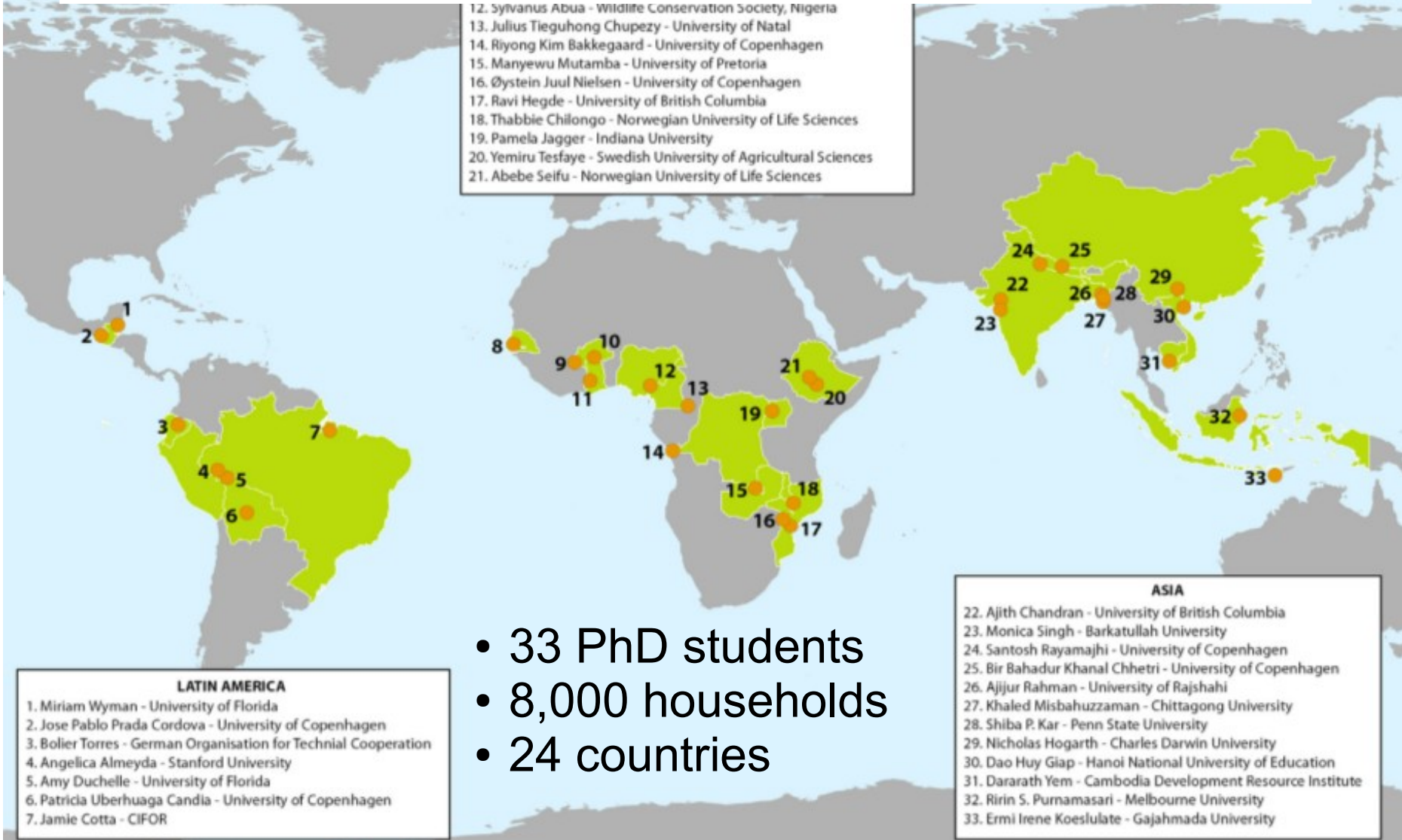
- Rural households use natural resources
- Rarely included in national account (GDP of the poor)
 - lack of voice
 - who is really poor?
- Important to “mainstream” environment into development policy
- Understanding how poor people depend on environment is crucial for shaping conservation and development policies





Poverty Environment Network

A comprehensive global analysis of tropical forests and poverty





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Environmental Income and Rural Livelihoods: A Global-Comparative Analysis

- 28% of total income is environmental income
- Subsistence environmental income is more important for poor than wealthy
- Wealthy have 5x higher environmental income than poor



Environmental Income and Rural Livelihoods: A Global-Comparative Analysis

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- Wealthy have 5x higher environmental income than poor

BUT focus on forest communities and forest income

What about coastal communities?

"Strangely enough, even if income-poverty had been perceived for many years as the main dimension of poverty in fishing communities, only very few household surveys had been conducted to investigate this hypothesis. As a consequence, quantitative data on the role of fisheries on household income generation is rather anecdotal"
(Béné 2006)

What about coastal communities?

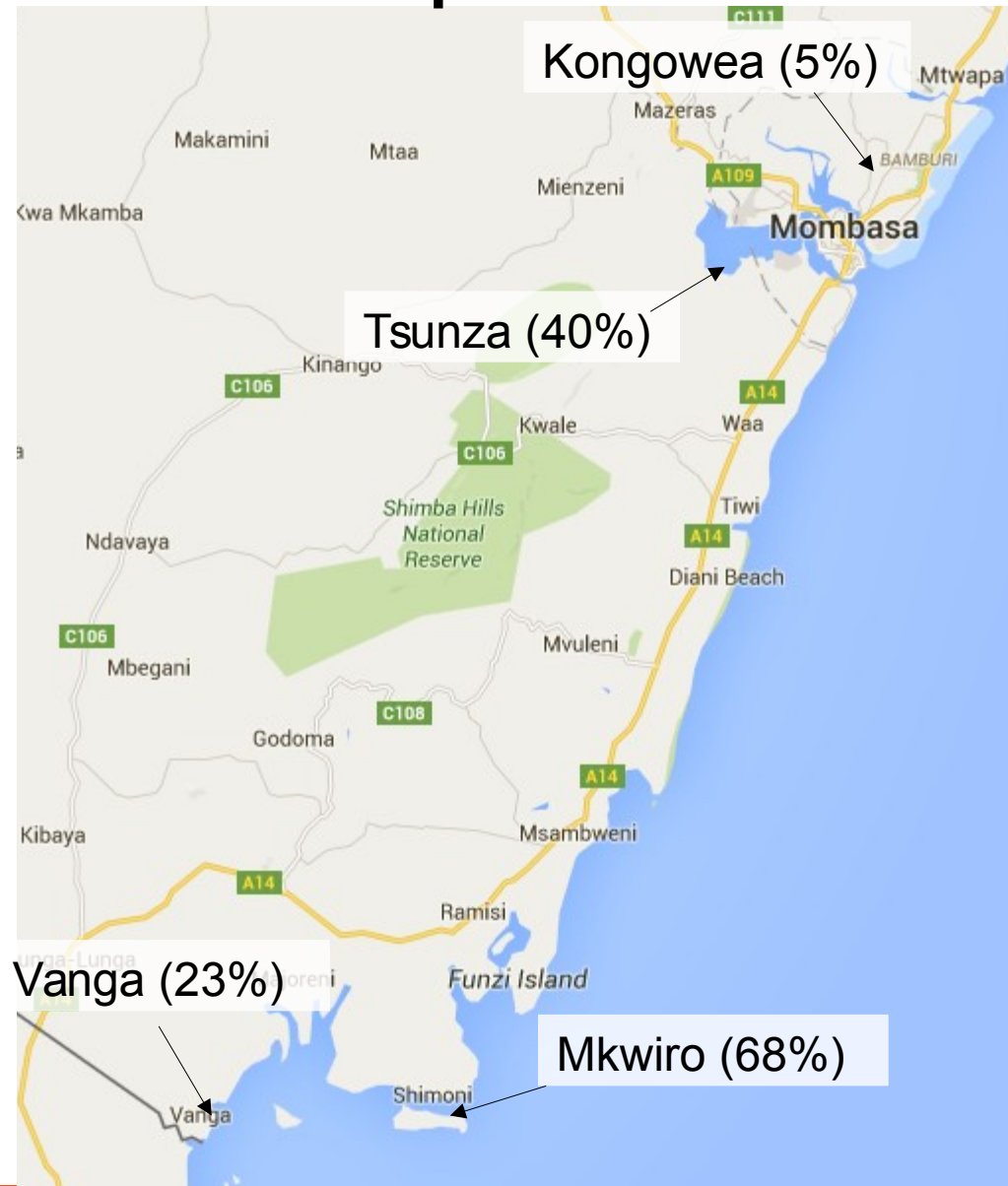
"Strangely enough, even if income-poverty had been perceived for many years as the main dimension of poverty in fishing communities, only very few household surveys had been conducted to investigate this hypothesis. As a consequence, quantitative data on the role of fisheries on household income generation is rather anecdotal"
(Béné 2006)

Livelihood engagement
Material Style of Life
Income from fishing among fishermen

Study sites & sample

- 3 rural sites
- 1 urban site
- Mangroves and coral reefs

- 722 households (random sample)



Research questions

- 1) What is the relative importance of environmental income?
- 2) Are the poor more dependent on environmental income than the wealthy?
- 3) Does environmental income reduce income inequality?
- 4) Does environmental income contribute to poverty alleviation?

Household survey

Net income (US\$ PPP/AME/day), based on:

- gross cash and subsistence income (local sales value)
- expenditure

What is environmental income?

Multiple definitions (Sjaastad et al. (2005) What is environmental income? Ecological Economics, 55, 37-46.)

Primary environmental income:

- value of harvested ecosystem products (subsistence or income)

Secondary environmental income:

- any other income linked to ecosystems through harvest (agriculture), trade or labour

Non-environmental income:

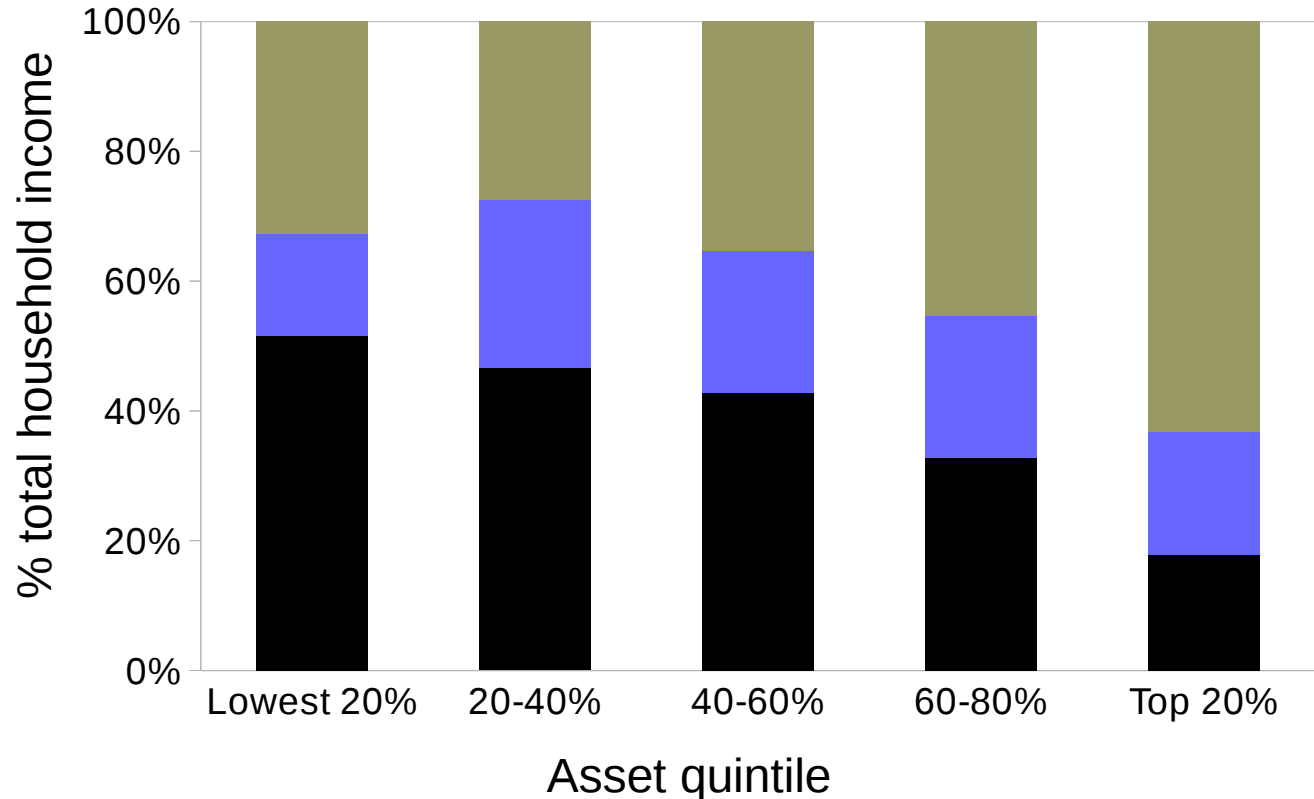
- Any income not linked to ecosystems

What is the relative importance of environmental income?

		% household income (cash + subsistence)		
		Mean	SD	Median
Rural	Primary	38.6%	38.2%	26.7%
	Secondary	20.9%	30.6%	4.5%
Urban	Primary	1.2%	8.9%	0%
	Secondary	13.4%	29.0%	0%

Are the poor more dependent on environmental income than the wealthy?

Rural households



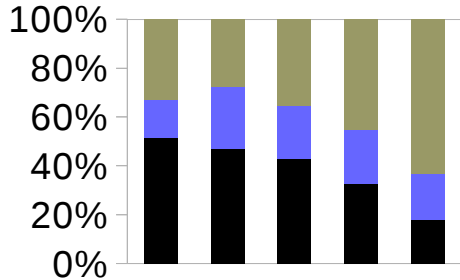
Non-environmental income

Secondary environmental income

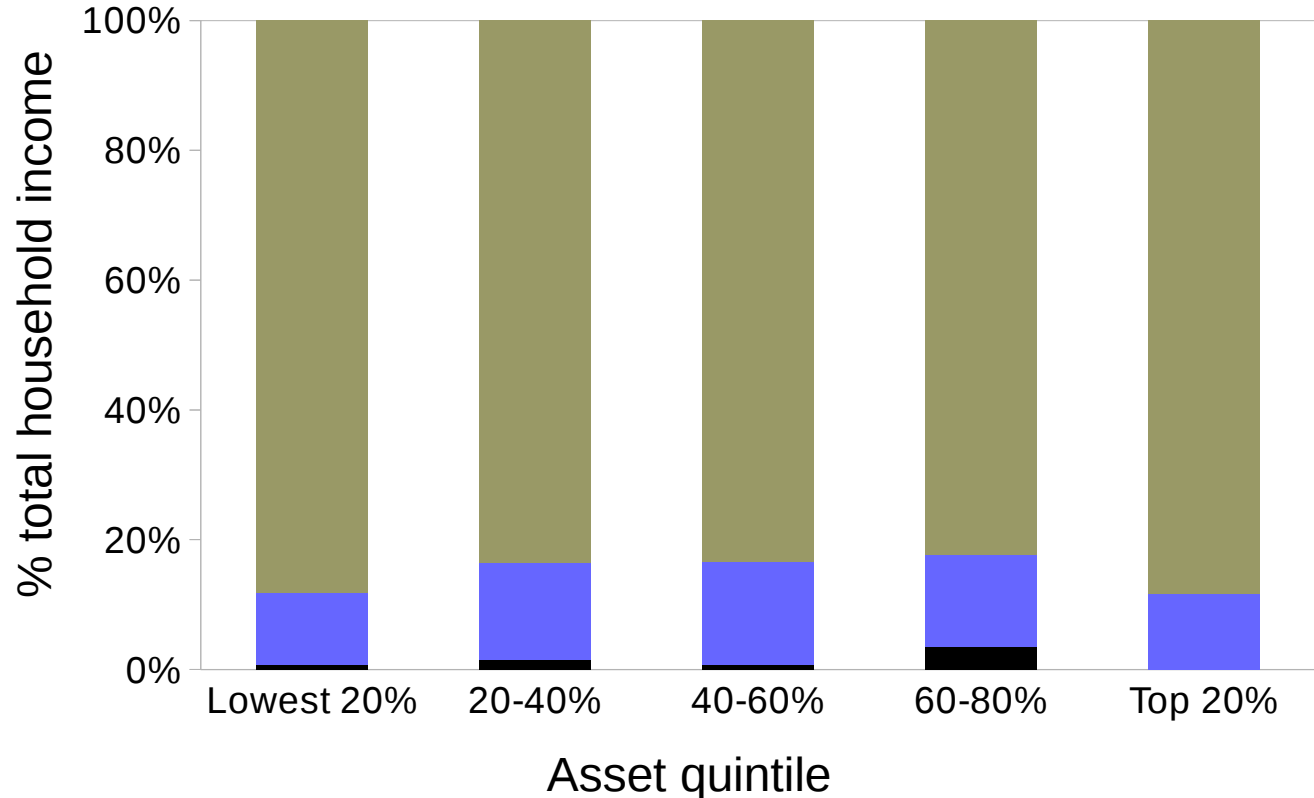
Primary environmental income

Are the poor more dependent on environmental income than the wealthy?

Rural



Urban households



Non-environmental income
Secondary environmental income
Primary environmental income

Does environmental income reduce income inequality?

Gini coefficient

0 = complete equality

1 = complete **I**nequality (one households has all the income)

	Rural
With environmental income	0.54
Without Primary environmental income	0.65
Without Primary & Secondary environmental income	0.71

Does environmental income reduce income inequality?

Gini coefficient

0 = complete equality

1 = complete **I**nequality (one households has all the income)

	Rural	Urban
With environmental income	0.54	0.56
Without Primary environmental income	0.65	0.55
Without Primary & Secondary environmental income	0.71	0.58

Does environmental income contribute to poverty alleviation?

	Very poor (US\$ PPP 1.25/day/AME/day)	Poor (US\$ PPP 2.0/AME/day)
<i>All households (rural)</i>	6%	20%

Does environmental income contribute to poverty alleviation?

	Very poor (US\$ PPP 1.25/day/AME/day)	Poor (US\$ PPP 2.0/AME/day)
<i>All households (rural)</i>	6%	20%
Primary environmental income		
0% (rural N=128)	18.0%	30.5%
>0% & ≤50% (rural N=115)	9.6% [NS]	20.0% [NS]
>50% (rural N=167)	6.6% [***]	12.6% [***]

Households that depend on environmental income (>50% of total income) are less likely to be poor

Does environmental income contribute to poverty alleviation?

	Very poor (US\$ PPP 1.25/day/AME/day)	Poor (US\$ PPP 2.0/AME/day)
<i>All households (rural)</i>	6%	20%
Primary environmental income		
0% (rural N=128)	18.0%	30.5%
>0% & ≤50% (rural N=115)	9.6% [NS]	20.0% [NS]
>50% (rural N=167)	6.6% [***]	12.6% [***]
Secondary environmental income		
0% (rural N=106)	11.3%	17.9%
>0% & ≤50% (rural N=234)	8.1% [NS]	17.9% [NS]
>50% (rural N=70)	20.0% [NS]	31.4% [*]

Binomial GLM df=407: NS = p>0.05; * = p<0.05; *** = p<0.001

Does environmental income contribute to poverty alleviation?

	Very poor (US\$ PPP 1.25/day/AME/day)	Poor (US\$ PPP 2.0/AME/day)
Secondary environmental income		
0% (urban N=220)	6.8%	14.5%
>0% & ≤50% (urban N=51)	5.9% [NS]	7.8% [NS]
>50% (urban N=41)	4.9% [NS]	7.3% [NS]

Binomial GLM df=407: NS = $p > 0.05$; * = $p < 0.05$; *** = $p < 0.001$

Does fishery rhyme with poverty?

	Very poor (US\$ PPP 1.25/day/AME/day)	Poor (US\$ PPP 2.0/AME/day)
<i>All households (rural)</i>	6%	20%
Primary environmental income		
0% (rural N=128)	18.0%	30.5%
>0% & ≤50% (rural N=115)	9.6% [NS]	20.0% [NS]
>50% (rural N=167)	6.6% [***]	12.6% [***]
Fishing income		
0% (rural N=221)	18.1%	30.3%
>0% & ≤50% (rural N=73)	2.6% [**]	8.5% [***]
>50% (rural N=116)	1.7% [***]	7.8% [***]

Final thoughts & next steps

- Environmental income and especially fishery is a way out of poverty!
- Households are vulnerable to environmental change due to environmental income dependence, to some extent even in urban areas
- General impression of poor rural communities. What do people spend money on?
- Environmental income and multidimensional wellbeing
- Engaging with development sector:
 - Gear-based management: What is the effect of gear type on poverty alleviation? And what are the implications for interventions and sustainability?
 - Area-based management: Environmental income per habitat



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