

Economic valuation of ecosystem services at the Ghanaian coast

A collaboration between IVM-VU, TDI, University of Ghana, ResearchLime and IUCN-NL

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Background and methods

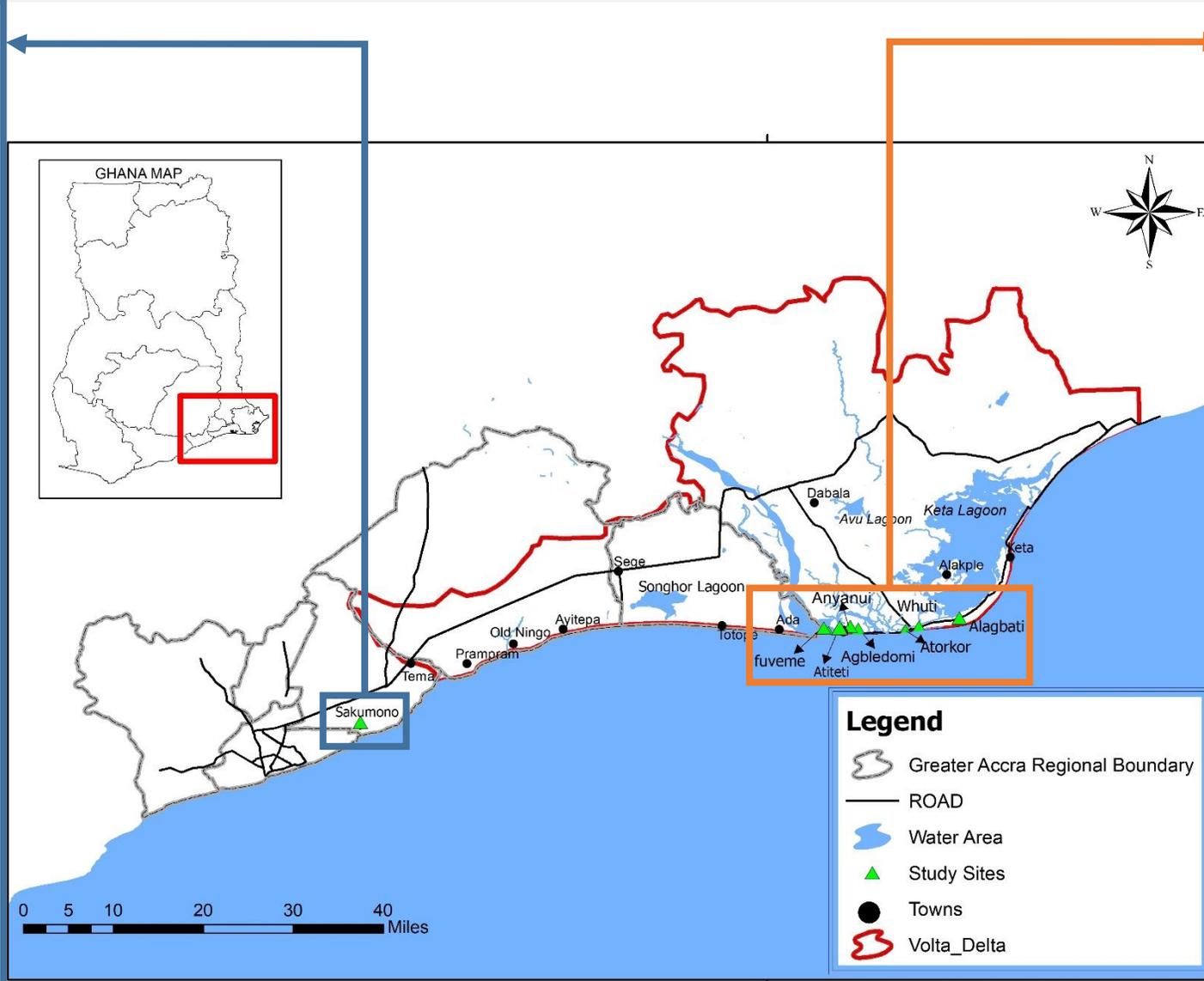
- **Aim:** investigate local people's awareness on environmental threats and support for ecosystem restoration, and estimate the values of these ecosystems (i.e. coastal lagoons, beaches and mangroves).
- **Target group:** Sakumono community in Tema city and the coastal stretch between Fuveme and Anloga communities in the Volta delta.
- **Method (1):** Household surveys and a discrete choice experiment .
- **Fieldwork (1):** January 8th till April 16th 2019.
- **Sample (1):** 974 respondents.
- **Method (2):** Focus group discussions (only in the Volta delta).
- **Fieldwork (2):** April 24th till April 29th 2019.
- **Sample (2):** 25 focus groups including around 200 respondents.



General information

Sakumono: restoration of the Sakumono lagoon and beaches.

- 54% men.
- Average income is between 800-1000 cedis per month.
- Average age is 38 years.
- Mostly Pentecostal (42%), protestant (16%) or catholic (14%).
- No education: 17.4%
- Primary education: 19.3%
- Middle/JSS: 28.2%
- Secondary: 18.3%
- Higher education: 16.8%
- Main occupations are trader, fisher and fish monger.
- Only 9% works in port related activities, which is the main economic activity in Tema city.

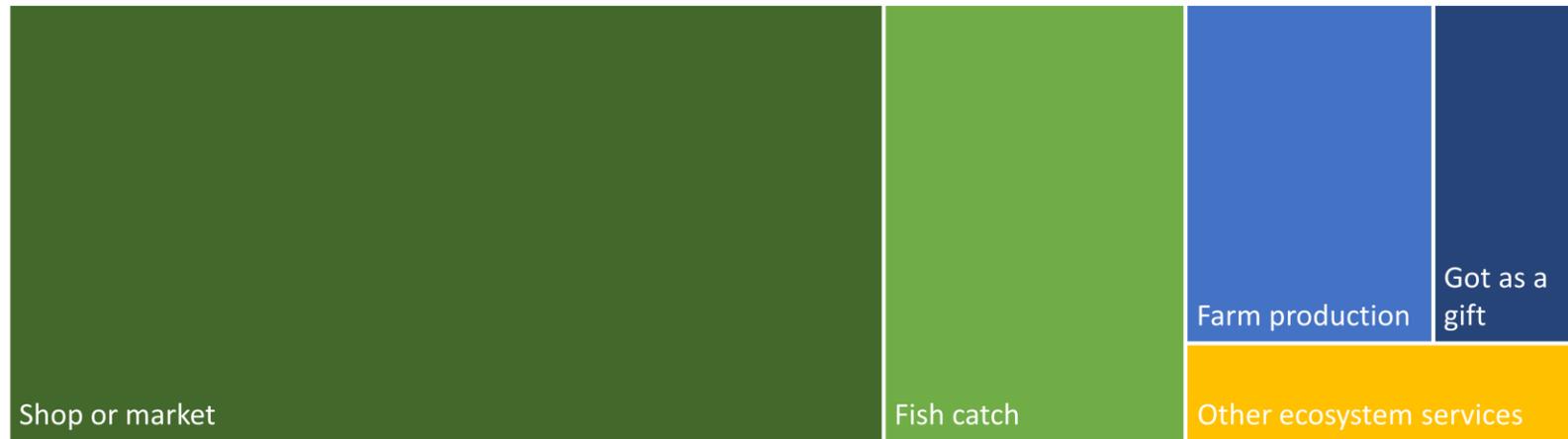


Volta delta: restoration of the Keta lagoon, beaches and mangroves.

- 62% men.
- Average income is between 600-800 cedis per month.
- Average age is 40 years.
- Mostly Pentecostal (44%) or traditional (26%).
- No education: 15.4%
- Primary education: 8.5%
- Middle/JSS: 28.7%
- Secondary: 21.8%
- Higher education: 25.8%
- Main occupations are farmer, fisher, trader and fish monger.
- Only 4.2% of the households receives income from tourism related activities.

Resource dependency

Food sources



Income sources



What percentage of your food/income comes from the following sources?

Conclusions

- 37% of **food consumption** comes directly from the local ecosystems.
- 50% of **income generating activities** is directly related to the local ecosystems.
- Very little income is coming from **tourism** related activities.
- Income “related to fishing” includes selling of own fish catch or farmed fish and wage labor in the fishing sector.
- Income “related to farming” includes selling of own farm produce and wage labor in the farming sector.
- Overall these results reveal a **high dependence** on the local ecosystems among the coastal communities.

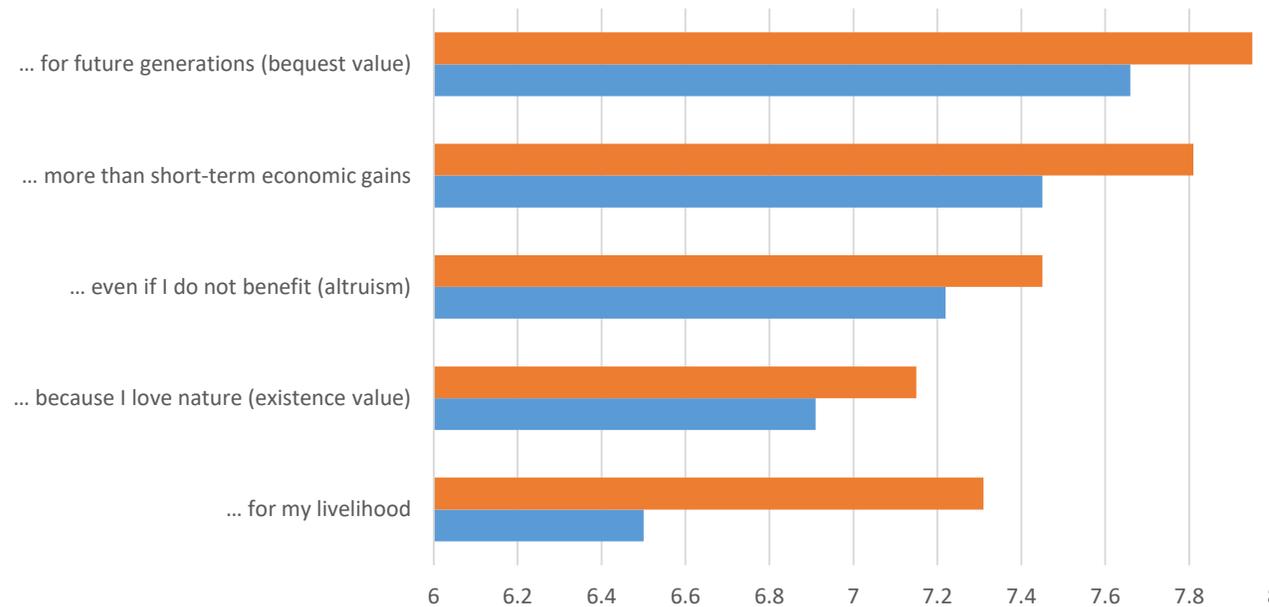
Socio-cultural connections to the ecosystems

Frequency	Lagoon	Beach	Sea	Mangroves (<i>Volta only</i>)
Daily	9.7%	14.2%	13.6%	10.8%
Weekly	24.3%	43.2%	36.8%	17.6%
Monthly	16.3%	17.8%	14.0%	4.8%
Less than monthly	11.5%	9.8%	9.2%	6.2%
Less than half yearly	18.8%	8.1%	10.3%	7.7%
Never	19.3%	7.0%	16.2%	53.0%

How often do you visit the ... for recreational or spiritual purposes?

Conclusions

- On average, the beach and sea are visited most frequently for **cultural activities**, and mangroves the least.
- Cultural activities include communicating with ancestors, exercising, swimming, and more.
- In Volta, direct use of the ecosystems for **livelihood purposes** provide a more prevalent motivation for ecosystem restoration compared to Sakumono. Most households are active in fishing and farming or related economic activities, while very few alternative livelihood options are currently developed.
- **Bequest values**, meaning the value that is attached to the ability of future generations to enjoy the same ecosystem benefits, prove to be the most important non-use value attached to ecosystem restoration.

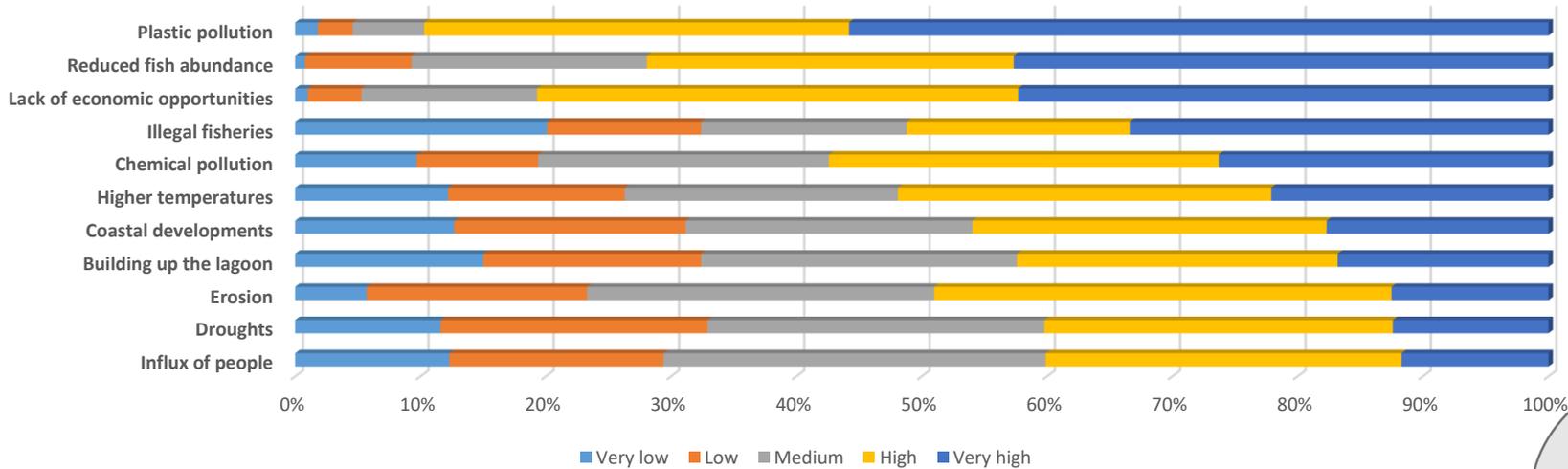


Restoring the ecosystems is important ...
Scale: completely disagree (0) to completely agree (10)

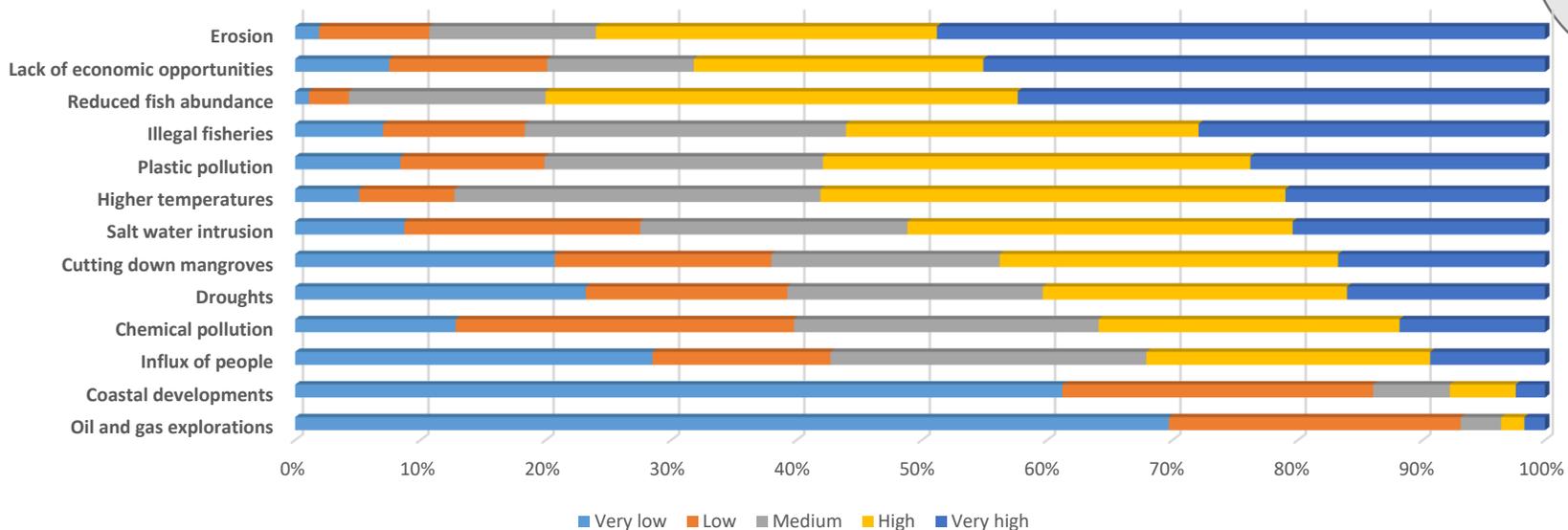
Volta
Sakumono

Awareness on environmental threats

Sakumono



Volta

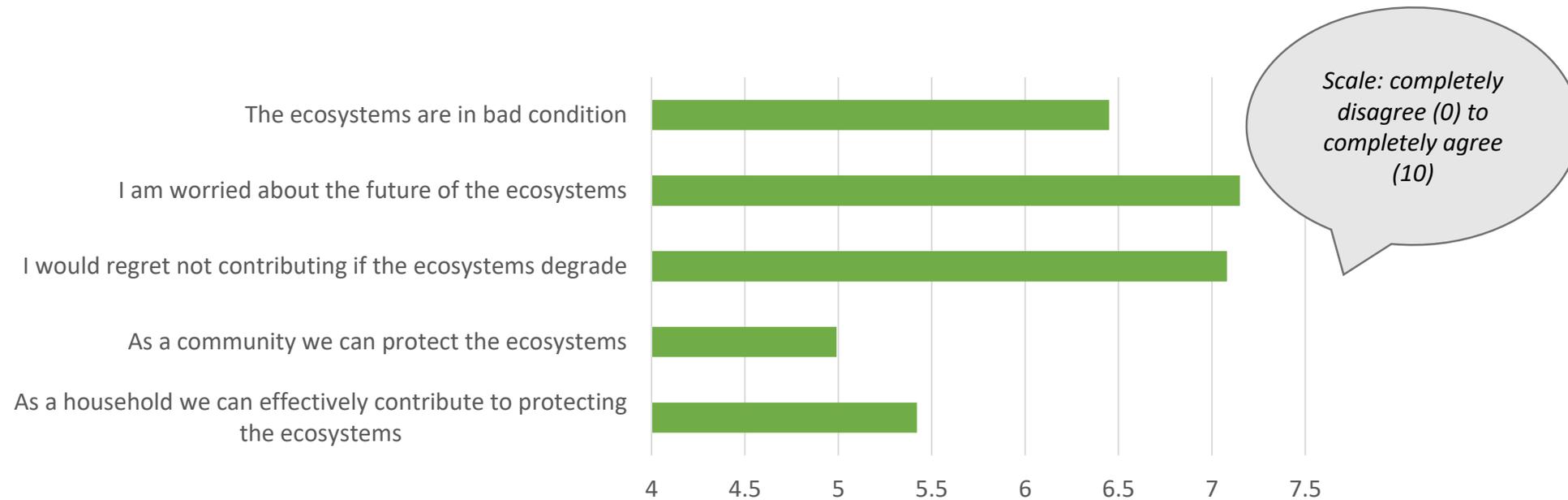


How high do you estimate the risk of the following issues to you and your community?

Conclusions

- In both communities, the **reduced abundance of fish** and the **lack of economic opportunities** are main threats for the households.
- Plastic pollution** is another main threat in Sakumono. The fishermen catch more plastic than fish these days, and their nets are tearing due to the sharp plastic parts.
- In Volta, **erosion** is another main threat, affecting farm land, properties and coconut trees (serving as anchorage). Daily lives, fishing and market activities are often interrupted by flooding.
- Threats like coastal development and pollution are **more prevalent in Sakumono**.
- Possible **future threats in Volta**, being oil and gas explorations and influx of people, are currently not experienced as such.
- In Volta, the dam, deep sea fishing and changing rainfall patterns are identified as **additional threats**.

Support for ecosystem restoration



Conclusions

- Two thirds of the respondents believe in the **need for action**. They find that the ecosystems are in bad condition, are worried about their future, and would regret not acting if they degrade further.
- However, a **feeling of efficacy** on changing the current course of degradation is lacking.
- Most people in the communities are willing to contribute time to **work on environmental projects**.
- Next to time, the people are also willing to **contribute small amounts of money** to environmental projects.
- These results reveal strong support for ecosystem restoration in both communities.

Are you willing to contribute between 1 and 6 days a month to environmental projects in your community?

	<i>Sakumono</i>	<i>Volta</i>
<i>Yes</i>	82%	74%
<i>No</i>	18%	26%

Economic valuation: current values

Fisheries

- 57% of the households catches seafood, like cassava fish, tilapia and shrimps.
- Total **revenues** of seafood equal 6.8 million cedis per week.
- 22% of is used for subsistence, 6% is given away for free.

Other natural resources

- 12% of the households collect other resources, like coconuts, firewood and sand.
- Total **revenues** of these resources equal 35,000 cedis per week.
- 30% is used for subsistence, 6% is given away for free.

Crops

- 40% of the households farms products, like okro, tomatoes, pepper and onions.
- Total **revenues** of farm products equal 1.9 million cedis per week.
- 26% is used for subsistence, 7% is given away for free.

Aggregated values

Total current value for the study area. Based on the households' income from selling natural resources, supplemented with the value of the resources used for subsistence.

6,000 households in total (around 1,200 in Sakumono and 4,800 in Volta).

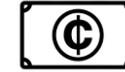
Including the subsistence values, a household gets an average **profit of 170 cedis a week** from the ecosystems.

The total **yearly value** therefore equals **53.2 million cedis**.

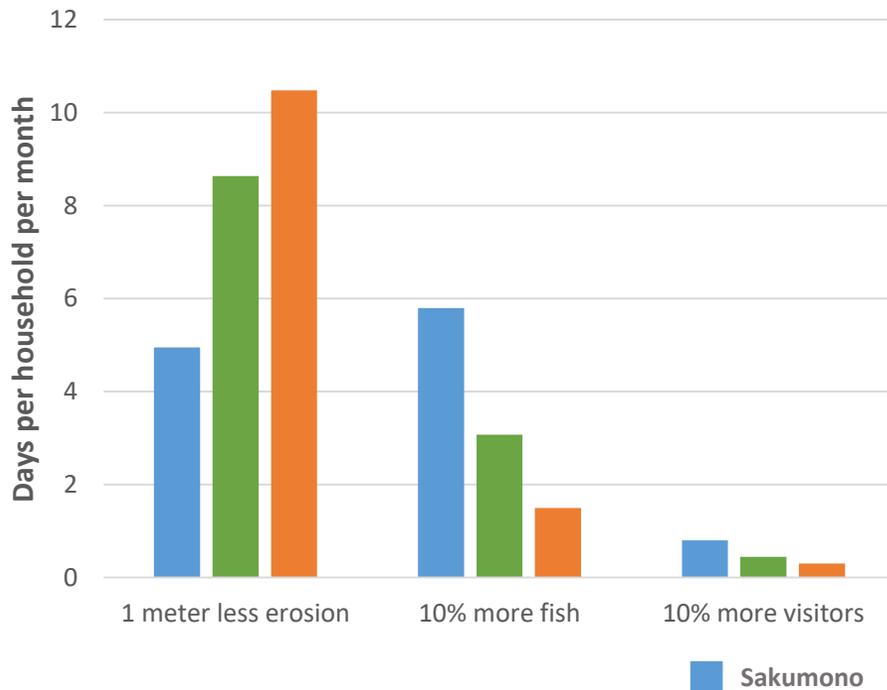
Conclusions

- Local households derive a **substantial amount of value** from the ecosystems.
- 78% of the value comes from **fisheries**.
- Much of the value is never seen on the market due to **high levels of subsistence**.
- **Costs of extraction** appear to be high when comparing revenues and profit.
- This also relates to poor market connections and lack of storage facilities which causes many **goods to deter**.
- Investing in more **efficient and sustainable tools** would increase the (long-term) value of the ecosystems, but lack of funds is a challenge commonly faced by farmers as well as fishermen.

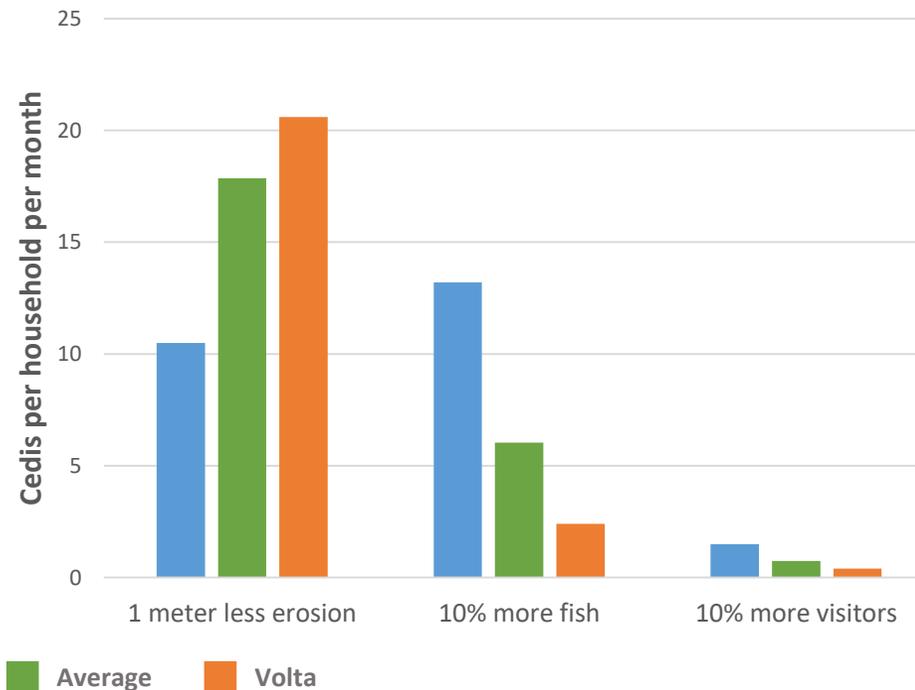
Economic valuation: future value creation



Time contributions



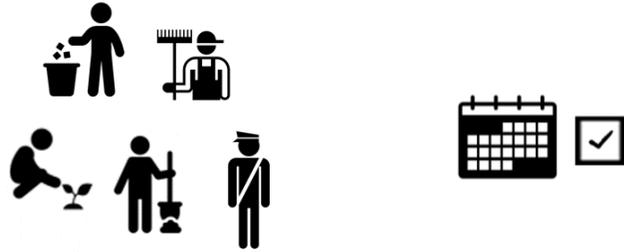
Money contributions



Conclusions

- Very high values are found for reductions in **erosion**, especially in Volta.
- Higher values are found for increases in **fish abundance** in Sakumono, where livelihoods are largely based on fisheries.
- For both sites, changes in **visitors** are valued less. In the Volta delta this indicates low awareness on tourism possibilities, for which the area shows high potential.
- A policy that would aim to reduce projected erosion by 2 meters/year, increase fish abundance by 4% per year, and visitors by 50% would result in a **yearly monetary value of 0.5 million cedis in Sakumono and 2.5 million cedis in Volta.**
- These values equal around **5% of the average monthly household income.**
- These values would be **higher** when the time estimates (converted to money) are applied.

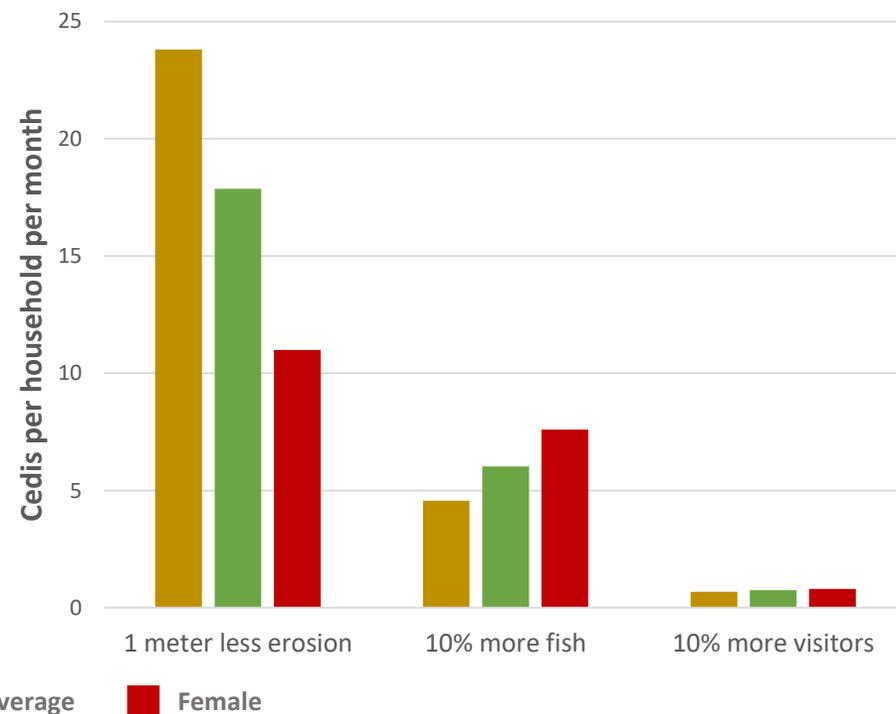
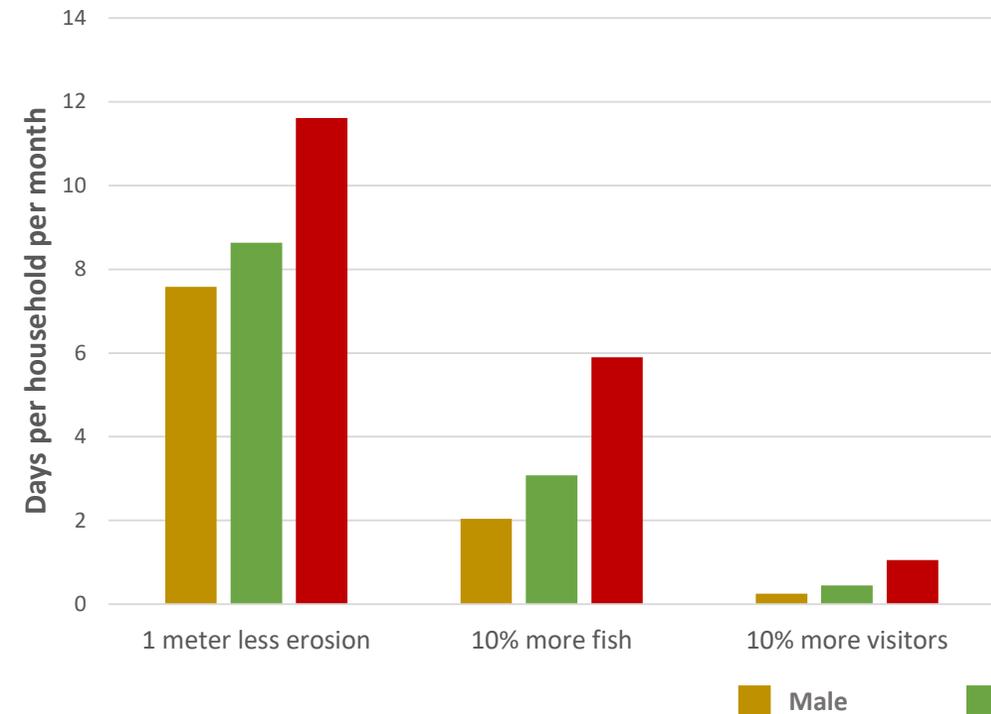
Gender differences in economic values



Time contributions



Money contributions



Conclusions

- **Willingness to contribute time is higher for women** compared to men.
- **Women are also willing to pay more** for changes in fish abundance and visitors. Generally men are more responsible for issues related to flooding and erosion, which could explain why men are willing to pay more for reductions in erosion.
- The focus group discussions highlight that, in the Volta delta, especially mangrove replanting and dredging of the lagoon are preferred by women. Both directly support trading and fish mongering activities, common **livelihood activities of women**.
- Environmental projects therefore provide opportunities for improving **gender equality** by complying to women's preferences.

General conclusions and recommendations

- Strong support for **local action and community co-management**, resulting from high dependence and (cultural) values related to the ecosystems in combination with the sense of “*need for action*”.
- **Large economic benefits** of the suggested ecosystem restoration projects are predicted..
- .. and these projects could support the achievement of several **sustainable development goals**.
- **Our research approach raised awareness** on ecosystem services and how communities can contribute, especially the discrete choice experiment appears to create a feeling of efficacy.
- **Further awareness raising** on ecosystem services could focus on future threats and opportunities.
- Behavior change campaigns should aim to create more feelings of **ownership and efficacy**.
- Local projects can furthermore include improving access to **credit markets**, setting up **community funds**, introducing new **cook stoves**, and supporting **alternative livelihoods**.
- Need to lobby for **policy changes** and **costly projects** at a higher level related to..
 - .. Reductions in coastal erosion,
 - .. Sustainable fisheries management,
 - .. Dredging of the lagoons,To which the community could contribute to through a **co-management design**, with time contributions or small amounts of money.
- Need to incorporate the results of this study in a **more detailed study** on the total economic value of the ecosystems that can feed into cost benefit analyses of different future scenario's.

Site-specific recommendations

Sakumono

- Need for more general sustainable development.
- Protection of fishing grounds that are of high importance to the community.
- Inclusion of results in ongoing urban planning practices, especially waste management.
- Employment of local people in port related activities.



Volta

- Need for ecosystem restoration and protection.
- Investments in storage facilities and transport network.
- Support alternative livelihoods like tourism (i.e. organizing activities, selling goods and working in facilities), animal husbandry, climate-resistant crops and fish farming.



For any further questions please contact:



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