

REPORT
ON
FIRST STAKEHOLDER WORKSHOP ON MANGROVES AS
NATURE-BASED SOLUTIONS TO COASTAL HAZARDS IN
EASTERN GHANA (MANCOGA)



27TH – 28TH JULY, 2022
ELI BEACH RESORT, KETA – GHANA



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1.0 BACKGROUND

The Department of Marine and Fisheries Sciences, the Institute of Environment and Sanitation Studies (IESS) of the University of Ghana and the Helmholtz-Zentrum Hereon Research Institute in Germany are collaborating to carry out a project titled “Mangroves as Nature-Based Solutions to Coastal Hazards in Eastern Ghana” (MANCOGA).

The MANCOGA project, funded by the MeerWissen Initiative of the German Federal Government forms part of efforts to support the reinvigoration of mangrove ecosystems and its associated services along the eastern coast of Ghana by developing a robust and participatory Nature-based Solution (NbS) using mangroves to address a variety of hazards such as climate change, flooding, coastal erosion and pollution, whilst covering aspects of blue carbon, ocean acidification and biodiversity loss with the ultimate aim of increasing community resilience and affluence.

A key component of the project is a Co-design phase, which seeks to incorporate the perspectives of stakeholders and practitioners into the design and production of the research. This, among others, is to ensure that stakeholders and practitioners co-own the research and actively participate in the co-production of knowledge to bridge the gap between societal needs, science, policymaking and implementation. This phase is expected to span from June 2022 to February 2023.

To kick-off the project, a first national stakeholder workshop on Mangroves as Nature-Based Solutions to Coastal Hazards in Eastern Ghana was organised to introduce and co-design the project with relevant stakeholders. The two-day workshop took place at the Eli Beach Resort in the Anloga District, Volta Region of Ghana on 27th and 28th July, 2022.

This report provides an overview of the stakeholder workshop. See **Appendix I** for workshop agenda.

2.0 ATTENDANCE

The workshop was attended by 49 participants (40 male and 9 female). This included representatives from the German Embassy, Ministries, Departments, and Agencies, Non-Governmental Organisations, Civil Society Organisations, the Community, as well as core MANCOGA team members from the University of Ghana and the Helmholtz-Zentrum Hereon in Germany. See **Appendix II** for list of participants.

DAY ONE

3.0 OPENING SESSION

3.1 Welcome Address by Prof. Francis Nunoo, Head of the Marine and Fisheries Sciences Department

Prof. Nunoo welcomed all participants and thanked them for honouring the invitation to the workshop. He mentioned that the purpose of the MANCOGA project was to provide support towards the reinvigoration of mangrove ecosystems and their associated services along the eastern coast of Ghana, adding that the success of that will help to improve coastal protection, reduce the influx of pollutants into coastal waters, increase carbon sequestration and ultimately, support the Blue Economy. He highlighted that hazards such as erosion, flooding and pollution were among the toughest environmental challenges confronting the coastline with rippling effects on livelihoods and the

economy. Further stating that the management of these issues were hampered by multiple factors such as the lack of reliable data and information and insufficient communication among stakeholders. Participants were informed that the MANCOGA project intends to use the history of erosion and flooding along the Ghanaian coast to develop a robust and participatory Nature-based Solution (NbS) that will rely on mangroves to address a variety of hazards such as climate change, flooding, coastal erosion and pollution whiles covering aspects of blue carbon, ocean acidification, decline in fish stocks and biodiversity loss with the ultimate aim of increasing community resilience and wealth creation. He indicated that a key component of the project was the co-design phase, which sought to ensure broad and comprehensive involvement of stakeholders from all levels of society and administration from design of the project to its implementation. He explained that incorporating the perspectives of key stakeholders and practitioners into the design and production of the research resulted in the ownership of the project by stakeholders thus bridging the gap between societal needs, science, policymaking, and implementation. He emphasized that the purpose of the workshop was therefore to brainstorm and design the project together.

3.2 Keynote Address by Ms. Sivine Jansen, Deputy Head of Mission, German Embassy

Ms. Jansen thanked the MANCOGA team for bringing together all stakeholders to co-design the project. She stated that the MeerWissen Initiative was launched in 2019 and has since funded 16 partnership projects, including MANCOGA. MeerWissen, she said, facilitates dialogue between science and policy, as well as data and digital innovation. She stated that MANCOGA was a component of MeerWissen's contribution to the UN Decade of Ocean Science for Sustainable Development. She emphasized that using mangroves to protect the coast from flooding and prevent coastal erosion was an example of how to address societal challenges by conserving nature with nature-based solutions. She also asserted that the MANCOGA project can count on the support of the German government and the German embassy.

3.3 Keynote Address by Hon. Henry Kokofu, Executive Director of Environmental Protection Agency (EPA)

Hon. Kokofu made mention of how the 1992 Constitution of Ghana affirms the need for sustainable development, specifying that Article 36(9) of the constitution requires the state to take appropriate measures to protect and safeguard the national environment for future generations and seek collaboration with other state and non-state actors to protect the environment. He stated that the EPA through its collaboration with the universities, state actors and development partners developed a GIS-based environment sensitivity atlas covering the entire coastline of Ghana, highlighting that one of the critical ecological resources that have been identified in the environmental sensitivity atlas of the coastal area of Ghana is mangrove. He noted that the coastal zone of Ghana was plagued with coastal inundation and massive erosion leading to displacement of communities, and that the eastern coast of Ghana in particular has been identified as the most fragile and vulnerable to these coastal hazards citing Dzita, Srogboe, Blekusu, Adina as communities with recent experience of massive erosion and inundation. He noted that the team's intention to use mangroves as nature-based solutions to help save vulnerable coasts was laudable and cost-effective. He however mentioned that despite the benefits mangroves provide, they are at risk primarily due to human activities, overexploitation, excessive pollution, coastal development, and global climate change. He commended the project team for utilising a co-design approach in the design and implementation of the research and stated he was optimistic that the approach employed will bridge the gap between the scientific research, policymaking and

implementation and assured the project team of EPA's technical and financial support, where necessary.

3.4 Brief Remarks by Togbui Kumassah, Traditional Leader of Anlo State

Togbui Kumassah stated that the Anlo-Keta landscape has been plagued by coastal hazards for decades, and that numerous efforts have been made to address the issue by individuals, civil society organizations, governments, and international agencies, including the construction of groynes and sea walls in the Keta and Dzita areas. He stated that, despite these interventions, the problem of coastal erosion and flooding has not been completely resolved. He lauded the project's goal of using mangroves to mitigate coastal hazards and pledged his support for its success. He cautioned, however, that mangroves were a source of livelihood for community members and suggested that other interventions, such as the provision of alternative livelihood, were needed to ensure the success of the project.

3.5 Brief Remarks by Hon. Seth Yormewu, District Chief Executive of Anloga District Assembly

Hon. Yormewu stated that he was honoured to host workshop participants in his district and brief them on the factors that pose threats to the district's mangrove ecosystem. He stated that the Anloga district is well-known for its natural resources, which include water bodies, sand and clay deposits, quarry and grassland and mangrove plantations. He explained that the aforementioned resources primarily served as a source of livelihood and employment for a large number of people in the district. He however stated that, natural occurrences and human activities such as sand winning, deforestation, bush burning, seawater intrusion, and the use of unauthorized fishing methods contributed to the depletion of these resources, particularly mangroves. He added that these factors coupled with lack of awareness about the importance of mangroves, lack of alternative livelihoods, conversion of mangrove ecosystems into different land uses, and lack of policy directives on mangroves, have degraded and reduced the cover of mangrove vegetation in the Anlo-Keta landscape. He advised that more education and advocacy on the importance of mangroves, enactment of a national law and policy to regulate mangrove harvesting, restoration of degraded areas, provision of alternative livelihood opportunities, and improvement of the landscape's hydrology to enhance natural regeneration were all necessary to reverse over-exploitation of mangroves and restore a resilient mangrove ecosystem in the landscape.

4.0 PRESENTATIONS

Below is a summary of presentations delivered during the workshop. Copy the link and paste it into your browser to access full presentations.

<https://drive.google.com/drive/folders/14Z-SxNw0BwnMjcKRm72WSDAfOAvtHjIz?usp=sharing>

1. *Overview of the MANCOGA project:* Presented by Dr. Edem Mahu and Dr Holger Brix, Co-leads of the MANCOGA project. This presentation provided participants with an overview of the challenges confronting Ghana's coast, particularly in Eastern Ghana, as well as the constraints to resolving these challenges. It further explained how mangroves can be used as nature-based solutions to mitigate coastal hazards. Participants were also introduced to the scope and objectives of the MANCOGA project, as well as its expected outcome and the proposed technology and tools available to be potentially used for the project.

2. *Concept and Tools of Co-design in MANCOGA*: Presented by Dr. D. Yaw Atiglo and Dr. Christiane Eschenbach, Co-leads of the Co-design phase. The presentation touched on the categories of stakeholders to be engaged for the project, their level of engagement as well as ladder of participation. It also introduced participants to the elements of co-design, the concept of Theory of Change, the collaborative tool (a proposed interactive online platform for all stakeholders) and the modified world café approach.
3. *Past, Present and Potential Futures of East African Mangrove Ecosystems and Their Natural Capital*: Presented by Prof. Rob Marchant, Department of Environment & Geography, University of York: This presentation focused on some examples of mangrove use and management activities from Tanzania in East Africa.
4. *Field Visit Orientation*: Presented by Antoinette Ankrah & Senyo Adzah, Project Coordinator & Research Assistant, MANCOGA. This presentation briefed participants on the purpose of the field visit and provided details such as date, time, attendees, communities to visit, and recommended outfit.

5.0 DISCUSSIONS

In response to a question on whether fish smokers were involved in the project, it was explained that the Lead of the Fish Smokers Association was present at the workshop. Participants were further informed that the project was still in its early stages, and stakeholder mapping ongoing, thus all stakeholders present were welcomed to suggest other stakeholders on board. A participant suggested that the Volta River Authority (VRA) be added to the list of stakeholders.

On whether MANCOGA intended to regrow mangroves as part of the project, it was stated that appropriate areas along the coastline would be identified for that purpose. It was further suggested that the growing of mangroves could be added to the Green Ghana Agenda of the Ministry of Lands and Natural Resources. To achieve this, MANCOGA seeks to be a long term initiative as opposed to a short-term research project.

In response to a question about the importance of mangroves to the government and the existence of policies to protect them, it was explained that laws and policies, though few, were in place to prevent indiscriminate harvesting of mangroves. Participants were further informed that mangroves were protected in areas designated as Ramsar sites.

In response to a question about how mangrove-dependent people can understand the need for change, it was suggested that community members should be introduced to alternative livelihoods. Another participant proposed that if mangroves are regarded as sacred, their indiscriminate exploitation will be reduced.

A participant inquired about how the project team intended to localize solutions, stating that because the problems were local, it was imperative that the solutions be as well. It was stated that the workshop was being held in Keta for that reason, with further explanations that the project team's intention was not to use a top-down approach, but rather to involve all stakeholders from the project's conception to identify indigenes' problems and work together to find solutions.

It was proposed that to ensure the progress and overall success of the project, the solutions of the research should benefit both stakeholders and locals. Another participant also suggested the

incorporation of the indigenous knowledge and culture of community members to ensure the project's success.

Clarification was sought on the Theory of Change (ToC) methods, particularly the underlying assumptions, it was explained that the ToC will be developed during the next workshop, where more detail will be provided.

A participant wanted to know what the second phase of the project will entail and whether primary and secondary data sources will be employed for the research. It was clarified that the data sources to be employed were dependent on the research questions that would be jointly developed by stakeholders in the subsequent workshop.

One of the participants stated that trees have economic values, and suggested that if mangroves were allowed to grow for longer periods, the end result would be more valuable mangrove products. Another participant stated that mangroves are underutilized in Ghana in comparison to other countries, citing Malaysia's success with mangrove utilization. He stated that more should be done to promote the economic importance of mangroves and its utilization in order for the Government to consider it worthy of its efforts.

A participant pointed out that a sustainable strategy to protect mangroves could foster confidence in fishing in the estuaries and proposed the recreation of the fishing industry.

When asked how the MANCOGA project team intended to improve the overall conditions of coastal communities, particularly mangrove conservation, it was explained that in addition to mangroves, eutrophication, mussel farming and hydrology improvements will be considered with the goal of achieving higher salinity. Another participant brought up the limitations of current actions and the high cost of dredging accumulated sediments due to altered hydrology as reasons why it would be advantageous to reconstruct hydrology using mangroves.

6.0 MODIFIED WORLD CAFÉ SESSION

Participants were divided into four groups (10 per group) to deliberate on the following themes in multiple rounds of 20 minutes each. Responses from the modified world café can be found in **Appendix III**.

- a. Exploring existing efforts towards the use of Mangrove in coastal protection
- b. Social, legal and environmental framework of existing conditions affecting mangrove ecosystems in Ghana.
- c. Benefits and limitations of mangroves as Nature-based Solutions
- d. Discussion about and decision on (first) elements for co-design

7.0 GROUP WORK

Participants were randomly divided into two groups for an activity. Group A was tasked with drafting the Theory of Change, while Group B was tasked with establishing project ground rules. The outcome of the group works can be found in **Appendix IV** and **Appendix V**.

8.0 CLOSING

8.1 Closing Remarks by Prof. Chris Gordon; Senior Scientist, MANCOGA

He stated that conditions for success have changed over time, emphasizing that issues such as climate change were not as pressing 30 years ago as they are today. He noted that it was essential to use technology when planning projects and added that tools such as digital twins and models should be utilized in projects. He also highlighted the significance of collaborating with stakeholders to ensure the success of a project, and encouraged all participants to notify the project team of any additional stakeholders who will be relevant to the project so that they can be invited to future workshops. He stated that although the country had bye-laws governing the protection of mangroves, they were not being enforced. He further stressed the importance of increasing community awareness about the importance of mangroves and noted that one of the primary approaches to mangrove management that emerged from the workshop discussions was alternative livelihood. To conclude, he thanked all participants for their insightful contributions to the workshop's success.

9.0 EVALUATION

9.1 Pre Evaluation

Participants were given the opportunity to share their expectations prior to the start of the workshop. 29 out of 36 participants (excluding the core MANCOGA team) completed the pre-evaluation forms. Below is a summary of their responses. See **Appendix VI** for a graphical illustration of the evaluation feedback.

Seventy-two percent (72%) of participants said “Yes” when asked if they had previously participated in research projects, 28% on the other hand responded “No”.

In response to the question on whether participants had ever heard about co-design, 41% responded in the affirmative, 45% of respondents indicated that they had no prior knowledge about co-design, 14% did not respond to this question.

Majority of respondents (78%) cited knowledge as an anticipated benefit of the workshop. Other anticipated benefits stated by respondents were to gain better understanding of the research, to learn about co-design, empowerment, achieving workshop objectives, and teamwork.

A total of 51% of respondents mentioned that they anticipated to share knowledge as their contribution to the workshop, 15% expected to share their expertise, while a few others hoped to contribute in terms of influence, collaboration and mangrove protection.

Forty-two percent (42%) of respondents cited impact as the overall expectation of the workshop, other respondents cited knowledge, achieve objectives, knowledge sharing, nature-based solutions, innovation, sustainable plan, value of mangroves as their overall expectation of workshop.

9.2 Post Evaluation

Twenty-one (21) out of 36 participants (excluding the core MANCOGA team) completed the post evaluation forms. Below is a summary of their responses.

Nearly all participants (95%) responded in the affirmative, when asked if their expectations about the workshop were met. Only 5% were dissatisfied and responded “No” with the explanation that they expected the workshop to provide a forum for stakeholders to express the institutional perspective of the anticipated project and what the various institutions were bringing on board.

Sixty-two percent (62%) of participants responded “Very good”, 33% responded “Good”, and 5% responded “Fairly good” when asked about the usefulness of the event. On whether participant’s expectation on co-design was met, 71% responded in the affirmative while 24% mentioned that their expectations were partially met giving reasons such as limited time for activities. There were no responses from 5% of participants.

38% of participants reported that their favourite aspect of the workshop was the group discussions, 33% also indicated that they liked the participatory approach utilised. Other participants stated the modified world café session, discussions on the co-design approach, presentations, and joint vision and understanding as their favourite experience.

In response to the question about the impact of mangroves as nature-based solutions on perception, 40% of respondents stated that they had gained more knowledge about mangroves as nature-based solutions, citing that they have obtained insights on mangroves can build coastal resilience to disasters and reduce water pollution. 15% reported that they have learnt about the ecological significance of mangroves and 10% stated that they acquired more knowledge on nature-based solutions. 5% of respondents said it had confirmed their experience, 5% mentioned that they saw the need for an alternative source of livelihood, 5% stated they were indifferent and 15% of respondents provided no response.

All participants agreed that the workshop provided an opportunity to ask questions, provide input, and participate, with 70% responding “Very good” and the remaining 30% responding “Good”.

Twenty-four percent (24%) of respondents stated that the time allotted for group work and discussions was insufficient, 17% indicated that time monitoring was poor. Other suggestions included improving internet connectivity, reducing workload, ensuring gender balance, involving more traditional leaders, providing workshop materials to participants prior to the workshop and involving more stakeholders.

All participants (100%) stated that they would recommend the MANCOGA workshops to a colleague.

DAY TWO

10.0 FIELD VISIT

10.1 Summary of Field Visit

The purpose of the field visit was to ascertain the nature of the coastline, view the coastal defense structures in place and identify the different species of mangroves available. Akplorwotorkor, Dzita and Anyanui in the Anloga district were communities selected for the field visits.

The coastal protection structure seen at Akplorwotorkor was a groyne. The team discovered that the sea defense wall was inadequate to safeguard the coastline from coastal



erosion. Following discussions, it was proposed that nature-based solutions be combined with hard engineering to mitigate coastal hazards. The team continued on to Dzita, where they identified white mangroves and black mangroves. The team also noticed new accretion and the harvesting of some mangroves without replanting. The team's final stop was at Anyanui, the primary mangrove marketing center, to gain a better understanding of how community members depended on mangroves as their primary source of livelihood. At Anyanui participants also saw how mangroves were bundled and stockpiled for sale to end users.

APPENDIX I: WORKSHOP AGENDA



Mangroves as Nature-Based Solutions to Coastal Hazards in Eastern Ghana (MANCOGA)
Project
First National Stakeholder Workshop
27th and 28th July, 2022
Eli Beach Resort – Tegbi, Keta

Agenda

Time	Session	Facilitator
Day 1 – 27th July, 2022		
8:30 – 9:00	Registration	
SESSION ONE		
9:00 – 9:10	Round of Introductions	All
9:10 – 9:40	Welcome Address	Prof. Francis Nunoo (Head of Department, Marine & Fisheries Sciences, University of Ghana)
	Keynote Address	Sivine Jansen (Deputy Ambassador, German Embassy) Hon. Henry Kokofu (Executive Director, Environmental Protection Agency)
9:40 – 10:00	Presentation – Overview of the MANCOGA Project • <i>Project Activities overview (Project objectives, background, scope, expected outcome)</i> • <i>Project Implementation Plan</i>	Dr. Edem Mahu & Dr. Holger Brix (Principal Investigators, MANCOGA)
10:00 – 10:20	Presentation – Concept and Tools of Co-design in MANCOGA	Dr. Christiane Eschenbach & Dr. Yaw Atiglo (Co-lead, Co-design Phase, MANCOGA)
10:20 – 10:30	Q&A Session	
10:30 – 10:40	Presentation – Threats to Mangrove Ecosystems in the Anloga District	Hon. Seth Yormewu (District Chief Executive, Anloga District Assembly)
10:40 – 10:55	Presentation– Past, Present and Potential Futures of East African Mangrove Ecosystems and Their Natural Capital	Prof. Rob Marchant (Department of Environment & Geography, University of York)
10:55 – 11:05	Q&A Session	
11:05 – 11:20	Coffee Break & Group Photograph Session	
SESSION TWO – World Café		
11:20 – 13:25	Topics:	Dr. Christiane Eschenbach & Dr. Yaw Atiglo

	- Exploring Existing Efforts towards the use of Mangrove in Coastal Protection - Social, Legal and Environmental Framework of Existing Conditions Affecting Mangrove Ecosystems in Ghana. - Benefits and Limitations of Mangroves as Nature-based Solutions - Discussion about and decision on (first) elements for co-design	(Co-lead, Co-design Phase, MANCOGA)
13:25 – 14:25	Lunch	
	SESSION THREE – Group Work	
14:25 – 15:25	Develop a Common Understanding and Common Vision.	Dr. Yaw Atiglo (Lead, Co-design Phase, MANCOGA)
	Establish Ground Rules	
15:25 – 15:40	Coffee Break & Questionnaire	
15:40 – 16:10	Joint Discussion of Group Work	Dr. Yaw Atiglo & Dr. Joanna Staneva (Lead, Co-design Phase and Expert, Digital Twin Development & modelling, MANCOGA)
16:10 – 16:40	Develop Positive (Draft) Project Idea and Research Questions	Dr. David Kaiser & Dr. Philip-Neri Jayson Quashigah (Research Scientists, MANCOGA)
16:40 – 16:50	Field Visit Orientation	Antoinette Ankrah & Senyo Adzah (Project Coordinator & Research Assistant, MANCOGA)
16:50 – 17:00	Closing Remarks	Prof. Chris Gordon (Senior Scientist, MANCOGA)
17:00	Closing (End of Day 1)	
Day 2 – 28th July, 2022		
Only district level stakeholders, community representatives and implementing partners		
8:00 – 12:00	Field Visit - Visit to selected mangrove sites - Visit to coastal areas with defense structures - Visit to coastal areas to ascertain nature of coastline	
12:30 – 13:30	Lunch	
13:30 – 15:30	Meeting with District Level Stakeholders and Community Representatives	
15:30 – 16:30	Implementing Partners Meeting - Recap of workshop and field visit - Next steps	
17:00	Departure	

APPENDIX II: LIST OF PARTICIPANTS

NO	NAME OF REPRESENTATIVE	INSTITUTION	GENDER
1.	H.E Sivine Jansen	German Embassy, Accra	F
2.	Hon. Henry Kokofu	Environmental Protection Agency	M
3.	Gladys Kwofie	Environmental Protection Agency	F
4.	Kojo Agbenor Efunam	Environmental Protection Agency	M
5.	Ing. Maxwell Zu-Cudjoe	Environmental Protection Agency	M
6.	Theodore Tello Nelson	Environmental Protection Agency	M
7.	Donnan Tay	Ministry of Sanitation and Water Resources	M
8.	Geoffrey Tamakloe	Ministry of Tourism, Arts and Culture	M
9.	Dickson Agyeman	Forestry Commission	M
10.	Lawrence Kisseh Tetteh-Ocloo	Keta Lagoon Complex Ramsar Site, Wildlife Division of the Forestry Commission	M
11.	Godwin Yegbe	Wildlife Division- Forestry Commission	M
12.	Ernestina Larbi-Mensah	Coastal Development Authority	F
13.	Mustapha Adamah	Ghana Maritime Authority	M
14.	James Aggrey	Water Resources Commission	M
15.	Hoenyedzi Godson Kafui	Hydrological Services Department	M
16.	Hon. Seth Yormewu	Anloga District Assembly	M
17.	Ernest Apenkwah	Songor Ramsar Site, Ada	M
18.	Gershon Kwadzo Tudaabor	South Tongu District Assembly	M
19.	Gideon Marc Nuviadenu	Anloga District Assembly	M
20.	Lawrence Awunyo	Keta Municipal Assembly	M
21.	Mohammed Halisu Adam	Ketu- South Municipal Assembly	M
22.	John Lumor	Mangrove Planters Association	M
23.	Kugbe Gershon	Mangrove Harvesters Association	M
24.	Elisha Abraham Ametepe	Mangrove Transporters Association	M
25.	Moses Agbenyegah	Mangrove Retailers Association	M
26.	Raphael De-Souza	National Disaster Management Organisation	M
27.	Samuel Brass Dedzo	Land Owners Association	M
28.	Vance Kwaku Adedze	Chief Fisherman	M
29.	Lotsu Raymond	Salt Miners Association	M
30.	Daniel Dunyah	Farmers Association	M
31.	Bright Adzagba	Keta Ramsar Center	M
32.	Raphel Ahiakpe	Sea Water Solutions	M

33.	Faustina Borkloe	Social Welfare Department	F
34.	Togbui Kumassah	Traditional Leader	M
35.	Eunice Ofoli-Anum	FSSD- Fisheries Commission	F
36.	David Akresi	Ministry of Local Government, Decentralisation and Rural Development	M
37.	Dr. Edem Mahu	University of Ghana	F
38.	Prof. Chris Gordon	University of Ghana	M
39.	Dr. Philip-Neri Makafui Jayson-Quashigah	University of Ghana	M
40.	Prof. Francis Nunoo	University of Ghana	M
41.	Dr. Donatus Yaw Atiglo	University of Ghana	M
42.	Senyo Adzah	University of Ghana	M
43.	Antoinette K. Ankrah	University of Ghana	F
44.	Dr. Benjamin Botwe	University of Ghana	M
45.	Dr. Andy Agyekum	University of Ghana	M
46.	Dr. Holger Brix	Helmholtz-Zentrum Hereon, Germany	M
47.	Dr. David Kaiser	Helmholtz-Zentrum Hereon, Germany	M
48.	Dr. Christiane Eschenbach	Helmholtz-Zentrum Hereon, Germany	F
49.	Dr. Joanna Staneva	Helmholtz-Zentrum Hereon, Germany	F

APPENDIX III: WORLD CAFÉ (QUESTION GUIDES / DISCUSSION POINTS)

Table A

Mangroves as Nature-Based Solutions (NBS)

1. What?
 - a. What has been done so far? Do you know examples from other regions or countries?
 - b. Are there any known examples in other regions of Africa?
 - E.g. Kenya
2. Are there any concepts from other areas that we can adapt and use in MANCOGA?
3. Can you give any ideas about how MANCOGA can use mangroves as NBS?

Theme	Responses
<i>Benefits of Mangroves</i>	• Protect fish and birds that live there • Mangroves help in fish stock building & habitation • Mangrove planting can help to breed more fishes and preserve our water bodies • Aquaculture development (shrimps)
<i>What has been done elsewhere</i>	• Being used as flood control (Songhor) • Watershed protection at Azizanya
<i>Ideas for MANCOGA</i>	• Census of mangrove trees • MANCOGA can use mangroves as a sea defense at Keta. This will save the Government money and protect people in/around Keta • Mapping mangrove types • Mapping mangrove soils including areas that had mangroves before • Wildlife extends mangroves to other districts • Planting of mangroves at areas marked for fishing • Provide technical assistance in preserving mangroves
<i>Alternative livelihood</i>	• Coconut and palm trees could be considered as alternative livelihood to regulate mangrove cutting • Use of coconut products as alternative livelihood • Habitat for wildlife which brings livelihood options • Develop shrimp farming and coal for exportation
<i>Nature-Based Solutions</i>	• For development planning schemes as a natural alternative to flood control and air purification for settlements • Controls erosion • Mangrove as NBS has to be tailor-made: coastal protection solution used might be different from breeding areas for fishes in terms of species and nature of restoration strategy • Can be used to protect coastal areas where tidal waves destroy properties

TABLE B**Social, Legal and Environmental Framework**

1. Are there any social frameworks guiding mangrove ecosystems in Ghana?
 - a. Think about cultural significance, norms and systems
 - b. What about access to mangrove ecosystem services?
2. What existing legal frameworks (policies/laws) guide mangrove ecosystems?
 - a. How effective are they?
3. What environmental frameworks affect mangrove ecosystems in Ghana?
4. What are the opportunities (or challenges) for utilizing the existing frameworks for mangrove ecosystems in Ghana?
5. Who are the main actors responsible for mangrove ecosystems?

Theme	Responses
<i>Social:</i>	• Associations and Cooperations • Tenureship / land tenure system • Livelihoods • Established sacred groves • Community managed protection (Community Resource Management Area) • Incentives for conservation / Deterrent measures • Inheritance • Traditional laws • Advocacy for protecting buffers
<i>Environmental:</i>	• Inter-governmental treaties & agreements • National policies • Recognition of mangroves as a national commodity/plant • Advocate for national laws to protect mangrove ecosystem
<i>Legal:</i>	• Consolidated Wildlife Laws (LI 1659) • Assembly bye-laws • Bye-laws backed by national laws to protect mangroves • Cooperative formation of/by land owners • Government playing a key role in mangrove protection and outlining its benefits to people • Licensing and permit regimes

TABLE C

Benefits & Limitations

1. What are the advantages of mangroves as NBS for protection of vulnerable coasts in Ghana?
Think about erosion, flooding, wave action etc.
2. Time: needs long-term engagement: what does this mean for the success expected?
3. Money: not a short-term endeavour; requires long term planning; sustainability
4. Well-being of people (ecosystem services): food, regulation in the context of climatic change
(Keywords: carbon sequestration, cultural and aesthetic values)

➔ Why is it (nevertheless) important to use mangroves as NBS

Theme	Responses
<i>Benefits of Mangroves</i>	Economic/ livelihood • Source of livelihood and employment (harvesting of natural resources) • Promote eco-tourism • Used by fuel as fishmongers to smoke their fish • Source of timber for construction, furniture and building • Medicine • Honey • Bees as pollinators • Purifies the water • Habitat for migratory birds and wildlife • Aquaculture: - Serves as breeding grounds for fisheries (lobsters) - Trapping of fishes and crabs Nature-based solutions • Serves as coastal stabilisation/ fortification • Absorbs more CO₂ • Fixed carbon • <i>Outwelling e.g. of carbon for long-term storage in deeper waters</i> • Flood control • Benefit from carbon credit • Breakers for storms and tidal waves • Serves as buffer
<i>Limitation</i>	• Long maturity period • Impact of overexploitation and overharvesting • Land tenure & land ownership • Mangroves can hinder navigation for fishing in the lagoon • Discontinuous engagement • Inability to enforce legal policies governing mangroves • Encroachment (filling the site with rubbish/debris by dwellers) • Lack of collaboration/ownership • Lack of management plan

TABLE D**Co-design elements**

1. Which elements of co-design would you prefer for information (online vs. print/ social media / etc)
2. What are your expectations with regards to the community tool? Which features are most important (from your point of view)?
3. How important do you consider your potential contribution to the project?
 - a. Which tools do you prefer for cooperation and collaboration?
4. Will co-ownership of the research project ensure sustainability of project results? How?
5. Ranking elements of co-design according to relevance, which elements shall we realise first?

Theme	Responses
<i>Preferred elements of co-design for information</i>	• Usage of infographic and PA systems mounted on vehicles to disseminate information • Social media (Twitter, WhatsApp) • Physical / Face-to-face interactions (in-person) • Print media • Email • Use of local language • Online • Community information systems (information van; information centres) • Workshops • Interactive section where people can brainstorm on issues
<i>Preferred tools for cooperation and collaboration</i>	• Provide information • Regulator and policy development • Local bye-laws • Interviews • Experiences • Engagement/ Engagement through email • Merrymaking: having lunch with people or attending some festive activities
<i>How co-ownership ensures sustainability?</i>	• It involves multiple stakeholders • Stakeholder involvement helps effective implementations • Sharing of results • Precise decision • Ensure results are contextual to district • A sense of ownership will lead to much interest in sustaining and maintaining it • Co-ownership will ensure sustainability • It will make local stakeholders feel responsible for their actions towards the success of the project • The project will be owned by all who were part of the design. All co-owners should be given roles to help sustain the project • Participatory meetings for all stakeholders • Acceptance and ownership • Ensure accountability and provide more ideas and opportunities to finding solutions • Involvement of opinion leaders in discussions throughout the project • Important to ensure accurate and reliable data

	• Co-ownership comes with a sense of responsibility. The project will be under the watch of the policy makers and beneficiaries hence, maintenance becomes high and a priority. The project could be sustained for a long time, if not forever • Local content is taken into account • All stakeholders will feel part and dedicate towards its process • Co-ownership of the research will ensure results because different ideas will be generated to ensure sustainability
Ranking elements of co-design according to relevance, elements to realise first	• Communication • Periodic workshops • Regular public education • Stakeholder engagement • Regular exchange of data (email, WhatsApp) • Public durbars • Sharing of reports • Community engagement/ Community entry • Getting research objectives • Provision of comprehensive alternative livelihoods • Stakeholder analysis and selection • FGDs to identify needs, wants and problems • Data collection and interpretation • Face-to-face • Stakeholder inclusion in problem definition • Ranking • Stakeholder engagement and sensitization (visits) • Identification of relevant members/stakeholder to form the co-membership for the design

APPENDIX IV: DRAFT MANCOGA THEORY OF CHANGE

Key: WP- Work Package; WT- Work Task; WO- Work Output

NB: Tasks and Indicators are tentative and will be revised as project proceeds

Resilient coasts in eastern Ghana: Challenges (issues): Over-dependence on mangroves for livelihoods (mangrove depletion), Land tenure system, Coastal erosion, Estuary blockage, climate change, use of hard engineering, insufficient data, mindset (perceptions, perspectives...), livelihood diversification, culture, inadequate monitoring and evaluation by authorities, inefficient law/regulation enforcement, not incorporating indigenous knowledge system, Population pressure, Lack of education, Lack of community awareness, etc.						
	WP1	WP2	WP3	WP4	WP5	Assumptions
	Stakeholder (SH) engagement & collaboration	Research development and Implementation	Capacity assessment and building	Alternative Livelihoods	Project coordination monitoring and evaluation	a) The relevant stakeholders are receptive and can influence implementation of research b) High quality local research leads to policy impact c) Knowledge transfer is bi-directional between stakeholders and researchers d) Integrate findings to be implemented into an action plan (ToC??) -
ACTIVITIES/ INTERVENTIONS	WT1.1 Identifying Stakeholders	WT2.1 Data collection a) community entry b) sensitisation/ community engagement c) data inventory (collect available data) d) identify data gaps e) collect new data f) indigenous knowledge	WT3.1 Individual capacity building in a) co design, co-production, co-ownership b) Relevant software/ collaboration tools	WT4.1 Livelihood assessment	WT5.1 Develop M&E indicators	
	WT1.2 Mapping of	WT 2.2 Coastal erosion	?Student/volunteer training for mangrove	WT4.2	WT5.2 Clearly defined measurable	

	stakeholder and their activities relevant to MANCOGA Project	a) Mangroves as NBS b) Hard engineering	sampling, mapping, monitoring???	Identify alternative livelihood options a) Coconut farming b) Woodlots (community-based) c) More options to use high quality products from mangroves that require older mangroves and less-than-competent harvesting d) mangrove management for carbon or pollution trade-offs	indicators for work tasks	
	WT1.3 Stakeholder Workshop	WT2.3 Estuary blockage - Dredging (advocacy??)	? training in the use of digital tools, data evaluation???	WT4.3 Improving the fishing industry (regenerative aquaculture)		
	WT1.4 Regular stakeholder engagement (online meetings, phone calls, face-to-face, social media...)	WT2.4 Sensitization/ education	? capacity exchange in mangrove commercialization???	WT 4.4 Questionnaire for fisher folk		

OUTPUT	WT 1.5 Collaborative research and networking between researchers and stakeholders	WT2.5 Land tenure system: identifying users and right holders a) identifying landowners b) identifying investors c) identifying mangrove farmers				
	WT1.6 Collaboration with other researchers	?? (Blue Carbon/ Pollution)				
	WO1.1 Comprehensive list of stakeholders <i>Indicator: Database of SHs</i>	WO2.1 Established data system <i>Indicator: Data inventory Details of data Identified Indigenous knowledge systems</i>	WO3.1 Training in a) co-design, co-production, co-ownership of research b) relevant software and collaboration tools <i>Indicator: Number of persons trained in the above</i>	WO4.1 • Livelihood needs • Livelihood matrix <i>Indicator: Livelihood assessment report</i>	WO5.1 Indicators developed for at country level <i>Indicator: M&E report</i>	
	WO1.2 Grouping stakeholders by influence/interest Comprehensive list of stakeholder activities <i>Indicator: Database of SHs by influence/ interest</i>	WO2.2 Assessing mangroves as NBS Assessing impacts of hard engineering <i>Indicator:</i>		WO4.2 Livelihood options adopted <i>Indicator: Number of coconut trees planted</i>	WO5.2 Indicators for work tasks <i>Indicator: List of indicators for work tasks</i>	

	Database of stakeholders by activity	Assessment of mangroves and hard engineering on coastal erosion		Hectares of woodlots established mangrove managed for carbon or pollution trade-offs		
	WO1.3 Workshops with stakeholders <i>Indicator:</i> <i>Evaluation and reports of specific stakeholder workshop</i>	WO2.3 Estuary unblocked -Dredging done -(Advocacy for dredging done)		WO4.3 Training of Persons in aquaculture <i>Indicator:</i> <i>Number of personnel trained in mangrove related aquaculture</i>		
	WO1.4 Representative number of stakeholders contacted, engaged & activities involved <i>Indicator:</i> <i>Number of stakeholders engaged</i> <i>Report/minutes of online meetings</i> <i>Social media handles/platforms for stakeholder engagement</i>	WO2.4 Sensitisation and education done <i>Indicator:</i> <i>Number of persons reached</i> <i>Number of communities reached</i>				Influence: - Evaluate outcome before engaging influencers - Integrate findings to be implemented into an action plan Continuous sensitization enhances stakeholder interest and involvement

	WO 1.5 Collaborative research and networking between researchers and stakeholders <i>Indicator: Number of stakeholders involved in research activities</i> <i>Number of research activities involving or led by stakeholders</i> <i>Number of partnerships between researchers and stakeholders</i>	WO2.5 Mangrove users and right holders identified <i>Indicator: comprehensive list of mangrove owners and users</i>				
OUTPUTS	WO 1.6 Collaborative research with other researchers <i>Indicator: Number of joint publications with other researchers</i>					

OUTCOMES	<i>Strong collaborations among researchers and stakeholders</i> <i>Enhanced researcher-stakeholder engagement to ensure knowledge-driven policy impact</i> <i>Effective coordination and assessment of research and stakeholder engagement activities</i>	<i>Established data system</i> <i>Provide details of data</i> <i>Data availability</i> <i>Identify IKS</i> <i>Reduced coastal erosion</i> <i>Mangrove conservation</i> <i>Sustainable use of mangroves</i> <i>Increased fish stock</i> <i>Targeted awareness creation</i>	<i>Capacity building for researchers and stakeholders</i>	<i>Employment</i> <i>Poverty reduction</i> <i>Reduction in mangrove harvesting</i>		
	○ Knowledge/Evidence-based consideration of nature-based solutions over hard engineering solutions/methods ○ Broader framework for policy and programme interventions					
IMPACT	Resilient coasts in eastern Ghana: A coast that has less erosion and improved livelihoods (resilient blue economy)					

APPENDIX V: DRAFT GROUND RULES

EXPECTATIONS FROM THE PROJECT LEAD

- Frequent communication with stakeholders
- Major impacts on beneficiaries (impactful research)
- Community led action/change/advocacy
- Practical alternative livelihoods
- Sustainability of the project
- Capacity building

RESPONSIBILITIES

- Make data available (Pragmatic, Accessible, Free data)
- Sense of responsibilities from all agencies
- Snowball approach

PREFERRED COMMUNICATION

- Phone calls
- WhatsApp
- Telegram
- Community Tool (SAKAI)
- Emails
- Zoom
- In-person
- Google documents

How frequent should communications be?

- Monthly

Stakeholders to include:

- National Commission for Civic Education (NCCE)
- Create technical working groups to ensure continuity and official recognition of stakeholder participation

CONFLICT RESOLUTION

- Leadership and Follower problems (mistrust)
 - Engaging the people with the leaders known to them and enticing /motivating them
- Getting everybody heard
 - Using a community platform such as community information centres, WhatsApp platforms, group/association, email accounts

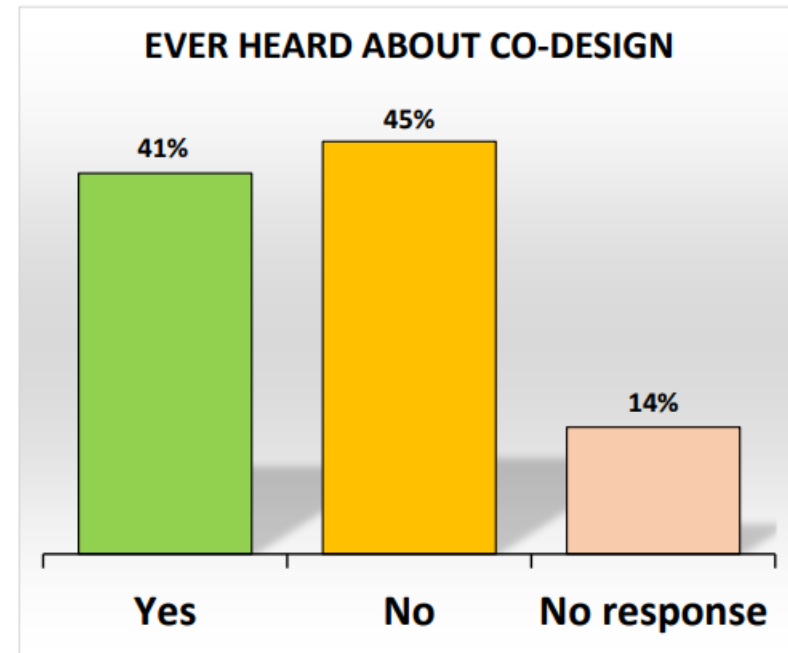
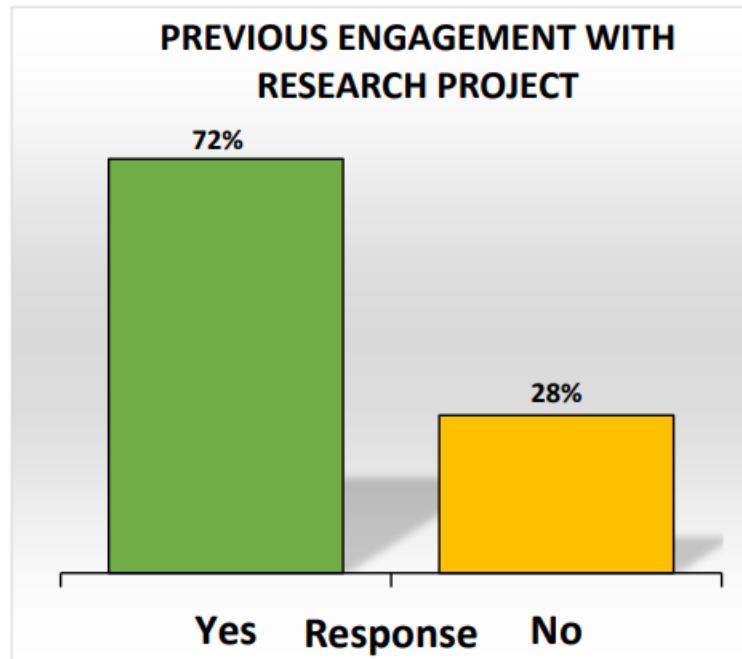
First MANCOGA Stakeholder Workshop: **FEEDBACK**



Antoinette Kailey Ankrah
Project Coordinator, MANCOGA

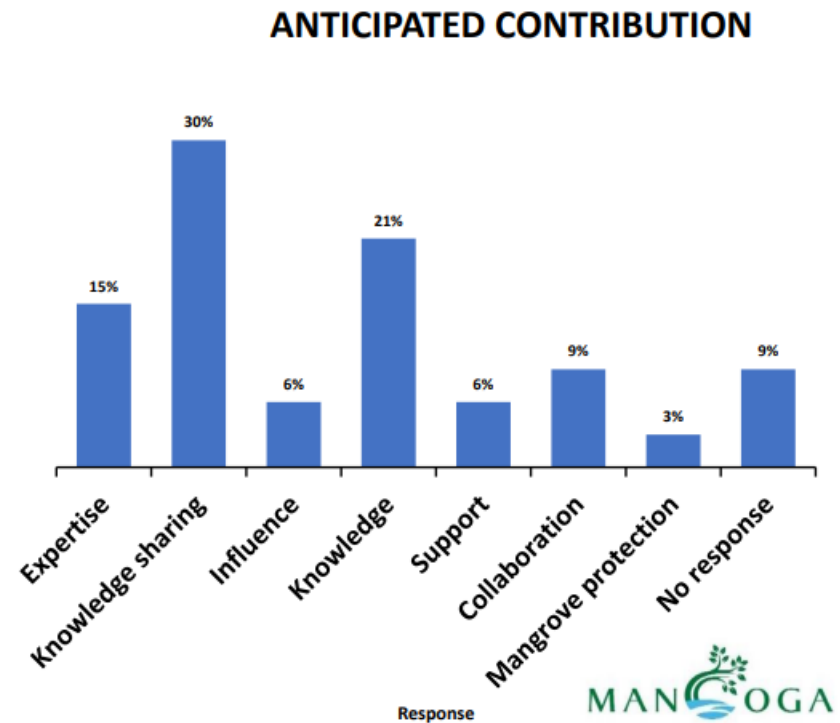
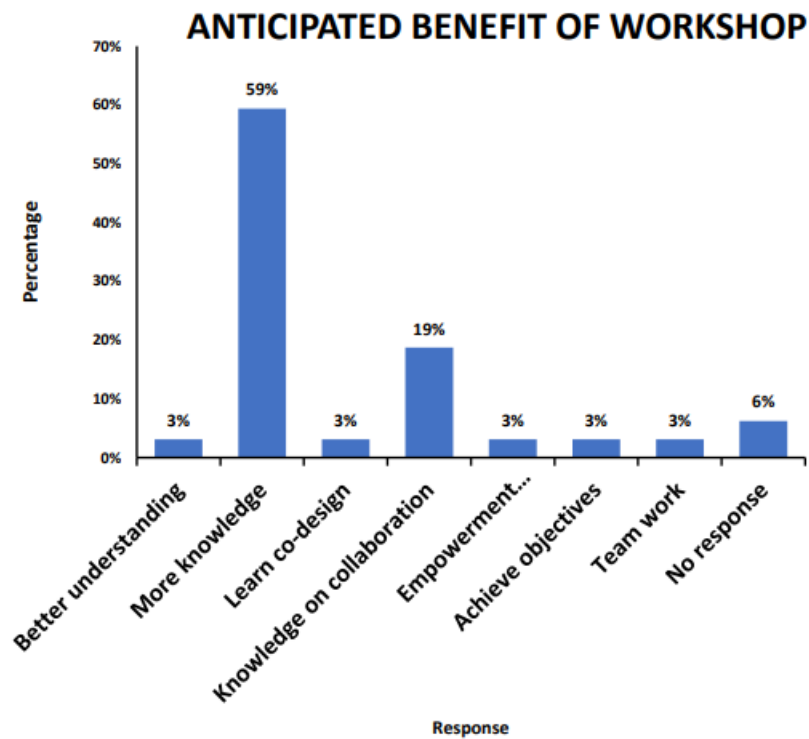


INITIAL EXPECTATIONS

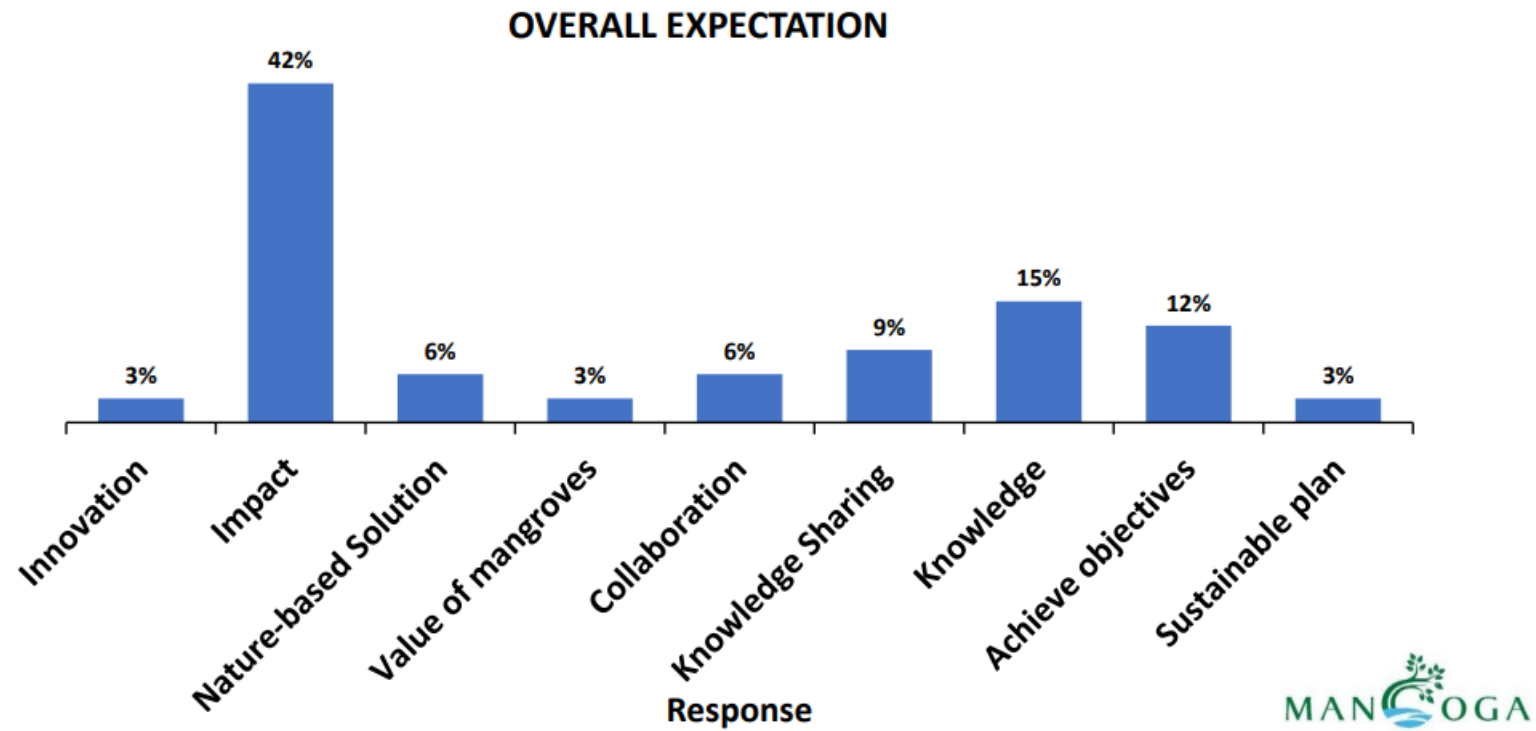


MANCOGA

INITIAL EXPECTATIONS

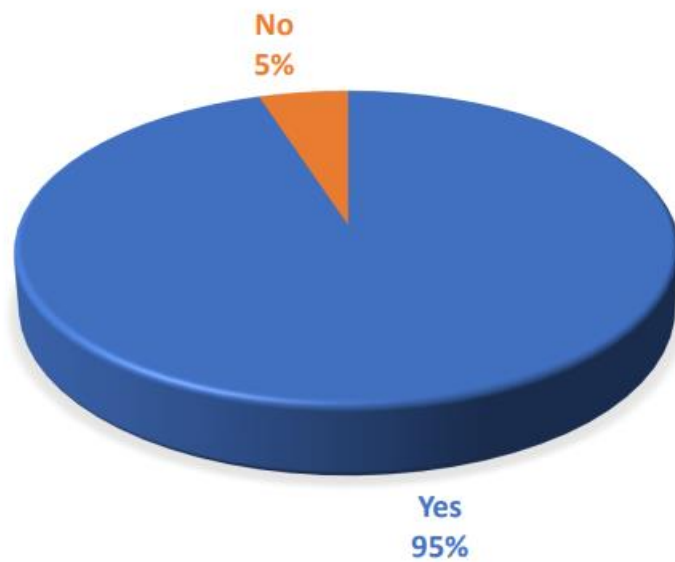


INITIAL EXPECTATIONS

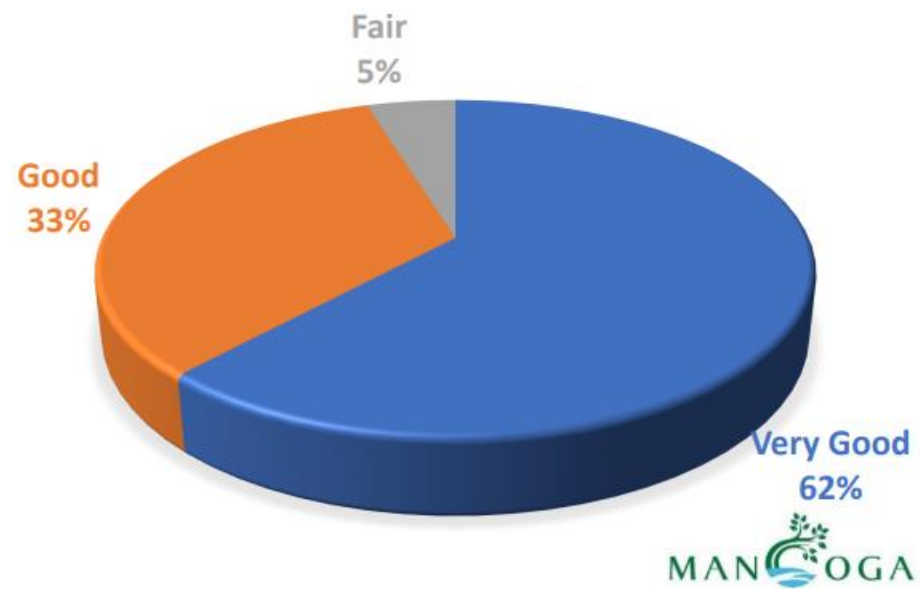


POST-EVALUATION

OVERALL EXPECTATION

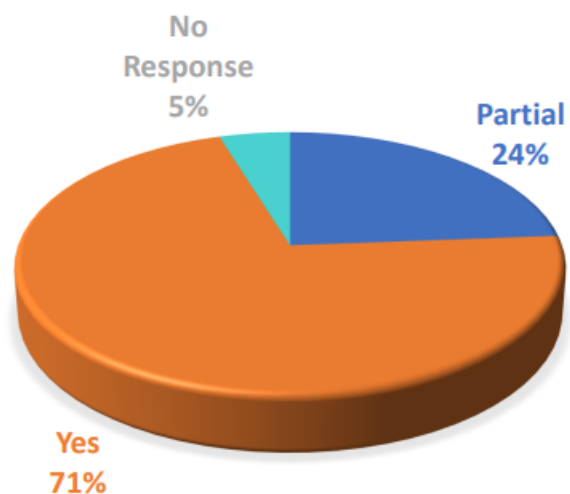


EVENT USEFULNESS

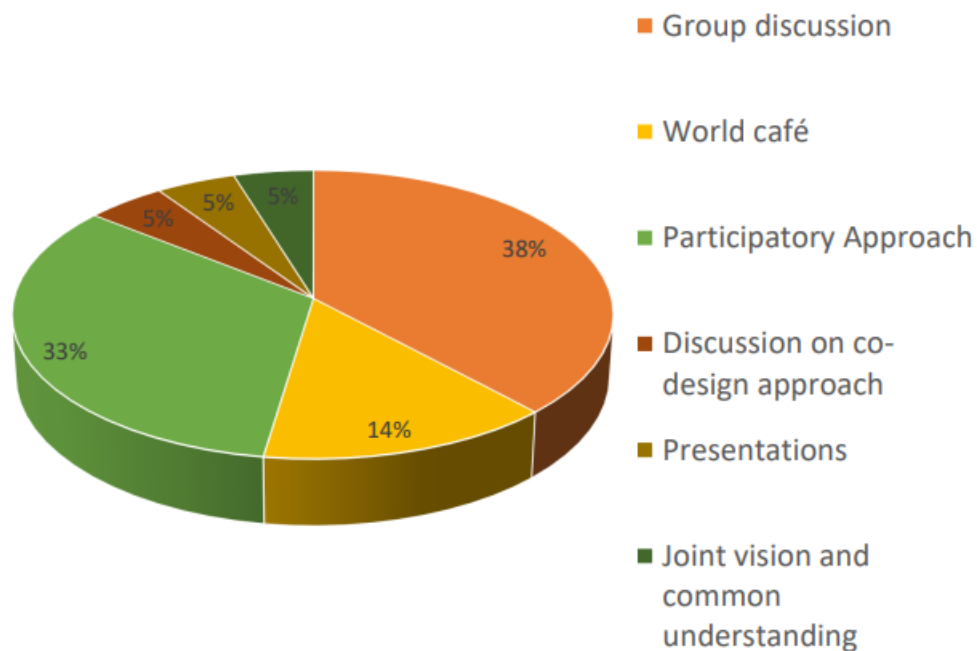


POST-EVALUATION

MET EXPECTATION ABOUT CO-DESIGN

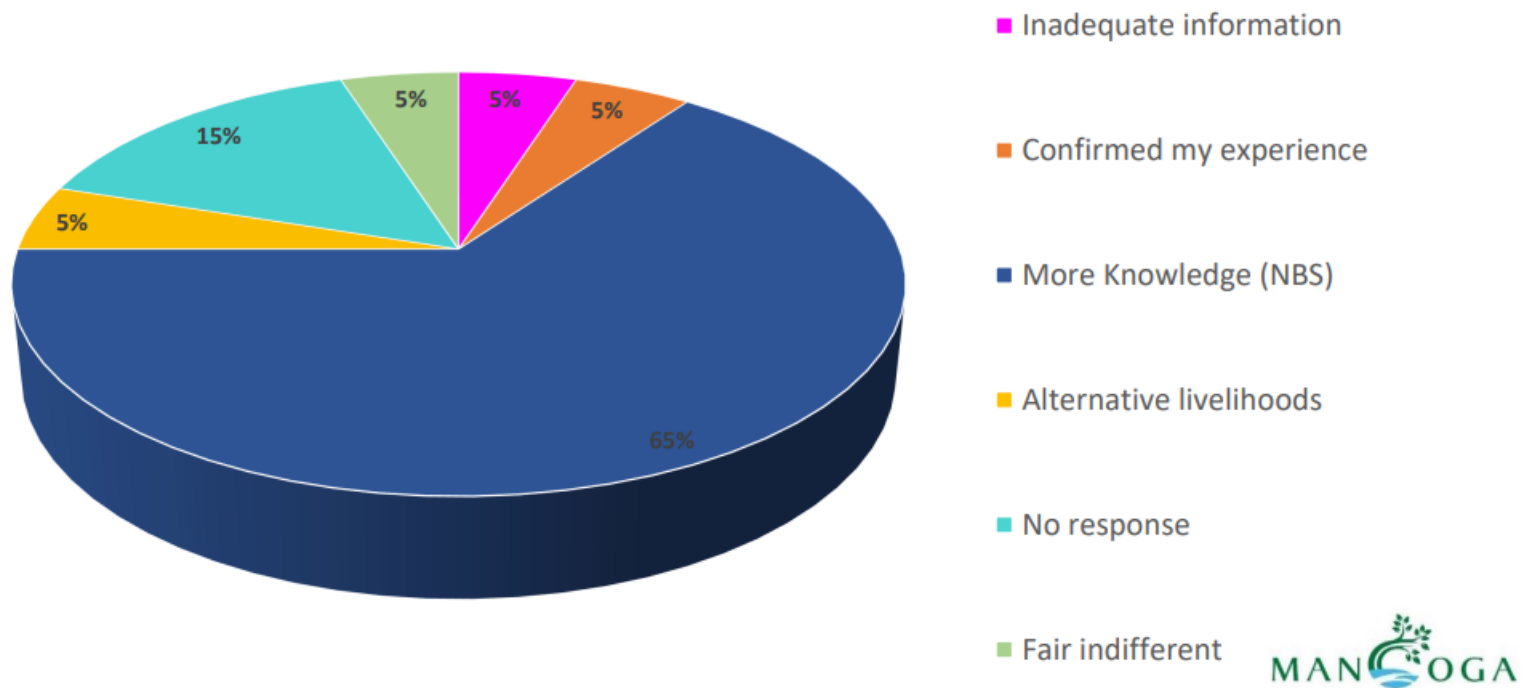


FAVOURITE EXPERIENCE ABOUT WORKSHOP



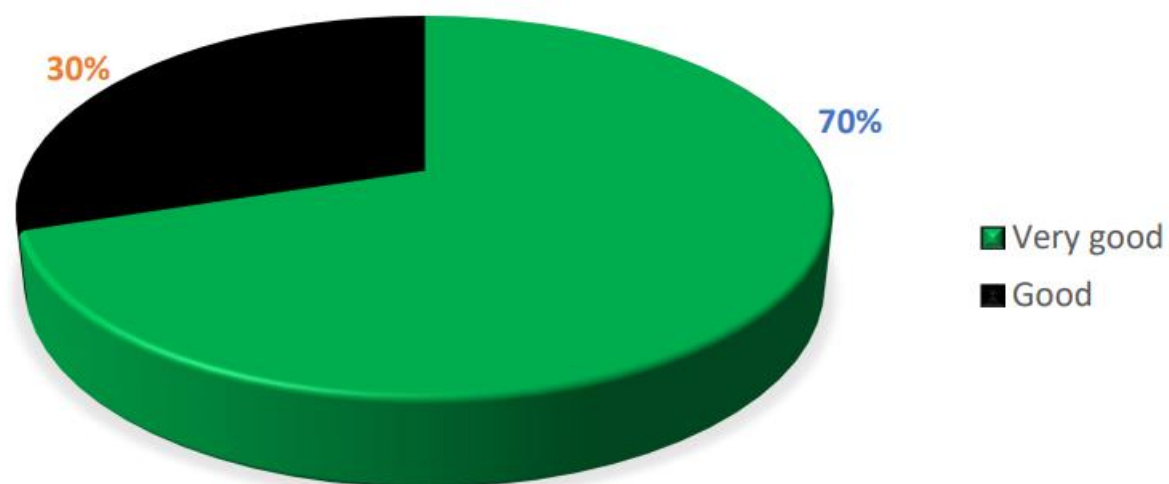
POST-EVALUATION

PERCEPTION OF MANGROVE AS NBS



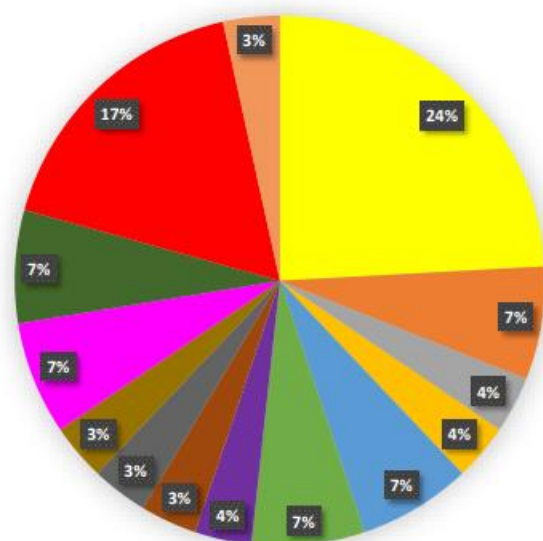
POST-EVALUATION

OPPORTUNITY AND PLACE TO ASK QUESTIONS, GIVE INPUT, AND PARTICIPATE



POST-EVALUATION

THOUGHTS/SUGGESTIONS



- More time
- Equal participation
- Venue
- Make presentation available
- Work Overload
- Stakeholder expansion
- improve virtual participation
- More discussion guides
- Gender
- Local participation
- Traditional leader participation
- Time monitoring

APPENDIX VII: PICTURE GALLERY



The Co-leads of the MANCOGA project making a presentation at the first stakeholder workshop



Ms. Sivine Jansen, Deputy Ambassador, German Embassy delivering a keynote address at the workshop



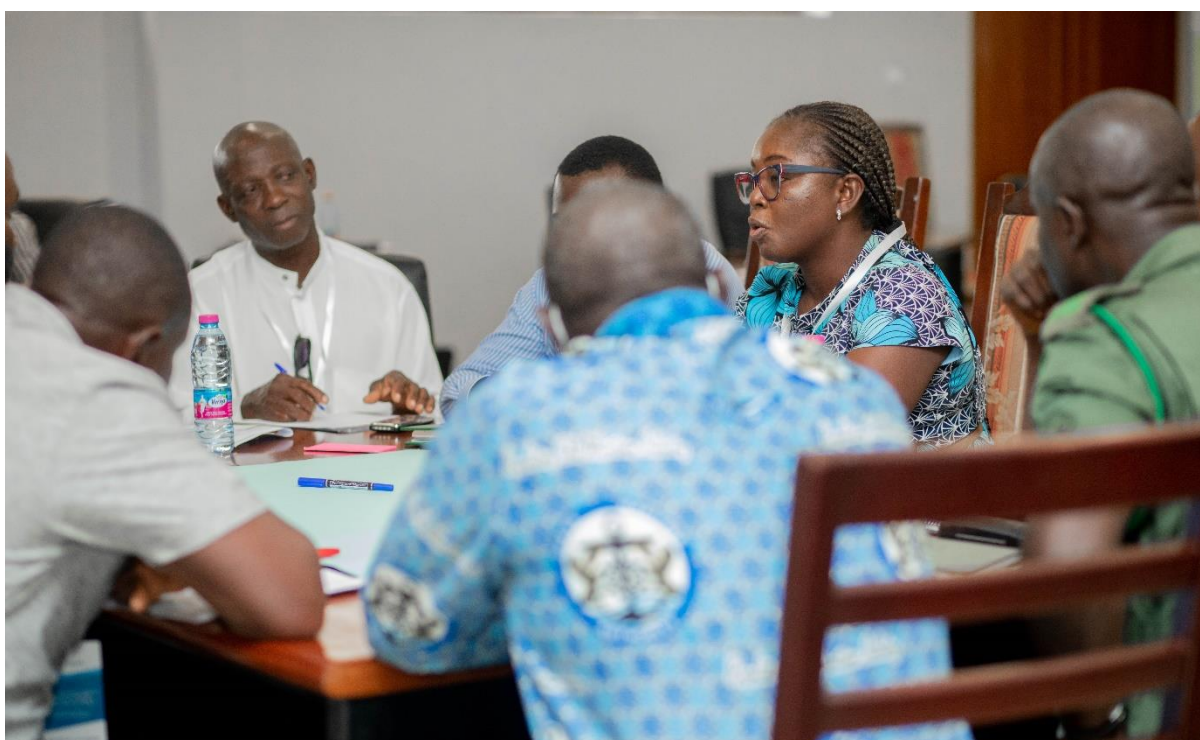
Hon. Henry Kokofu, Executive Director of the Environmental Protection Agency delivering a keynote address at the workshop



Stakeholders making contributions during the workshop



A cross section of participants at the first stakeholder workshop



Participants engaging in a group work session



Participants engaging in a group work session



A group photograph of attendees at the first stakeholder workshop



A picture depicting the nature of the coastline



A picture showing erosion along the coastline



A coastal protection structure observed during the field visit



Mangrove species observed during the field visit



Anyanui, the primary mangrove marketing centre