

**MANGROVES AS NATURE-BASED SOLUTIONS TO
COASTAL HAZARDS IN EASTERN GHANA (MANCOGA)
PROJECT**

FINAL CO-DESIGN PHASE REPORT



MAY 2023

**FUNDED BY THE MEERWISSEN INITIATIVE, DEUTSCHE GESELLSCHAFT FÜR
INTERNATIONALE ZUSAMMENARBEIT (GIZ)**

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TABLE OF ABBREVIATIONS

CODA	Coastal Development Authority
EPA	Environmental Protection Agency
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IESS	Institute of Environment and Sanitation Studies
MANCOGA	Mangroves as Nature-based Solutions to Coastal Hazards in Eastern Ghana
MESTI	Ministry of Environment, Science, Technology and Innovation
MLNR	Ministry Lands and Natural Resources
NbS	Nature-based Solutions
NGOs	Non-Governmental Organizations
ToC	Theory of Change

1.0 BACKGROUND

The Department of Marine and Fisheries Sciences and the Institute of Environment and Sanitation Studies (IESS) of the University of Ghana are collaborating with the Helmholtz-Zentrum Hereon of Germany on a project titled “Mangroves as Nature-based Solutions to Coastal Hazards in Eastern Ghana” (MANCOGA). The MANCOGA project seeks to support efforts at reinvigorating mangrove ecosystems and their associated services along the eastern coast of Ghana.

Coastal hazards such as erosion, flooding and pollution are major challenges facing many coastal areas of Ghana. The management of these issues is hampered by multiple factors including the lack of reliable data, unsustainable livelihood practices, insufficient communication structures among stakeholders and missing pathways to informed decisions with sustained impact.

MANCOGA seeks to develop a robust and participatory Nature-based Solution (NbS) that will utilize mangroves to address a variety of these coastal hazards, while covering aspects of blue carbon, ocean acidification and biodiversity loss with the goal of increasing community resilience and affluence.

To achieve the project’s objectives, MANCOGA will collect and analyse existing data, identify gaps and establish gap-filling mechanisms. The project team will work towards adapting a Digital Twin to the conditions along the eastern coast of Ghana that can be used with What/If scenarios to support new products and on-demand models assessing and predicting the role of mangroves as NbS to coastal hazards. The project will also deploy a digital toolbox to facilitate the collection, analysis and dissemination of archived and new observational data for knowledge-based decision-making via intuitive interactive tools for data summary, visualization and presentation.

A key component of the MANCOGA Project is co-design, which seeks to incorporate the perspectives of stakeholders and practitioners into the design and production of the research. This 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 technical report documents activities and milestones accomplished during the co-design phase which spans the period from June 2022 to February 2023.

2.0 ACTIVITIES UNDERTAKEN DURING THE CO-DESIGN PHASE

2.1 MeerWissen Kick-Off Meeting for African-German Partners

The co-design phase of the MANCOGA project commenced with the MeerWissen Kick-off Workshop for the 3rd Call and Networking Meeting organized by the MeerWissen Secretariat and the Western Indian Ocean Marine Sciences Association (WIOMSA). The workshop took place on the island of Zanzibar from the 6th to 11th of June 2022 under the theme ‘*building equal partnerships for marine science that matters*’. Though a networking event, the

MeerWissen leadership trained participants which included newly funded projects from Africa on approaches and considerations in co-designing a research.



Fig. 1 MeerWissen project partners at the MANCOGA kick-off and networking meeting

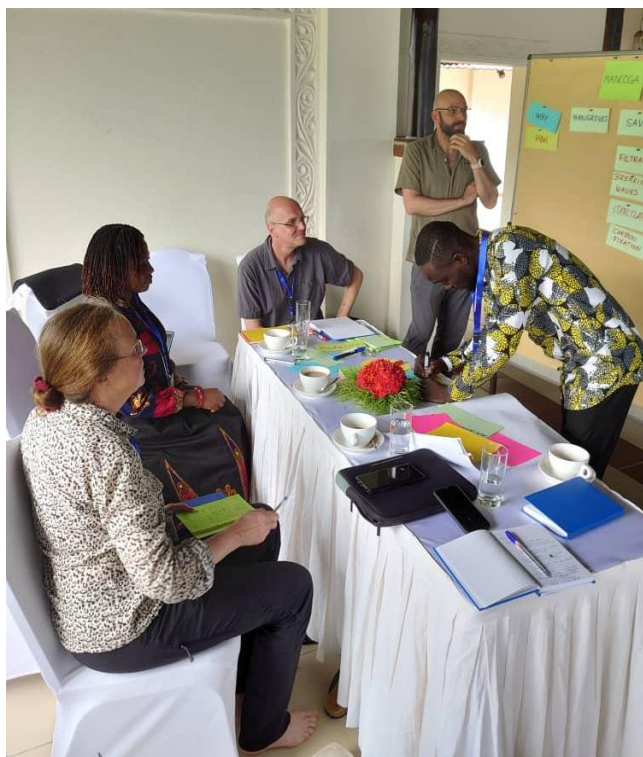


Fig. 2 Work session at the kick-off meeting



Fig. 3 MANCOGA project board developed at the kick-off meeting

2.2 Identification of Potential Stakeholders for the MANCOGA Project

Stakeholders play a crucial role in project implementation, thus all relevant stakeholders were identified. The project team employed brainstorming and snowball techniques in generating a list of potential stakeholders at the national, sub-national and community levels. This list was updated with inputs from stakeholders during the first and second workshops. A list of all stakeholders can be found in APPENDIX I: LIST OF MANCOGA STAKEHOLDERS.

2.3 Project Meetings

Project meetings were organized throughout the co-design phase of the project to ensure effective planning and coordination. The project team engaged in a series of in-person and virtual meetings during the co-design phase. These included planning meetings prior to stakeholder workshops as well as post-workshop meetings for evaluation purposes.



Fig. 4 Virtual project meeting



Fig. 5 In-person project meeting



Fig. 6 A Section of the MANCOGA project team

3.0 STAKEHOLDER ENGAGEMENTS

The co-design phase primarily consisted of stakeholder engagements. Stakeholders were engaged through several channels including regular emails, phone calls, letters, interviews and workshops.

3.1 Courtesy Calls

The project team paid courtesy calls to key national institutions to introduce the project to them and solicit support in all project activities including uptake of knowledge from the project. These institutions were the Ministry of Lands and Natural Resources (MLNR), Ministry of Environment, Science, Technology and Innovation (MESTI), Environmental Protection Agency (EPA) and Coastal Development Authority (CODA).



Fig. 7 Courtesy call to the Environmental Protection Agency



Fig. 8 Courtesy call to the Ministry of Environment, Science, Technology and Innovation

3.2 Stakeholder Interviews

Selected stakeholders at the national, sub-national and community levels were interviewed during the co-design phase. The purpose of these interviews was to ascertain their expectations of the project and to incorporate their views into the design and production of the research. These interviews have been compiled and incorporated into the "Living Product" document.

3.3 Stakeholder Workshops

Stakeholders were engaged in three separate workshops. The first and third workshops were held in-person, while the second was held virtually. These workshops aided in developing the Theory of Change, Ground Rules and Implementation Phase Proposal. Click on the link below to access stakeholder workshop reports.

https://drive.google.com/drive/folders/1dSiiLEP1SZ1_BlfQKg5IP-YCfPgUZGkU?usp=sharing

3.3.1 First Stakeholder Workshop

The first MANCOGA stakeholder workshop was held on the 27th and 28th of July 2022 at the Eli Beach Resort in the Volta Region of Ghana. A total of forty-nine (49) participants attended the workshop. These included representatives from the Ministries, Departments, and Agencies, District Assemblies, German Embassy, Non-Governmental Organizations, Civil Society

Organizations, Community-Based Organizations and MANCOGA team members from the University of Ghana and the Helmholtz-Zentrum Hereon in Germany.

The purpose of the two-day workshop was to introduce the project to stakeholders and initiate the co-design process. There were two major sessions, which were an indoor session (Day 1) and a field visit to the study site (Day 2).

3.3.1.1 Indoor Session

The concept of the MANCOGA project was introduced to participants at the indoor session. There were various presentations, modified world café sessions, group works and general discussions. These aided participants to understand the project and equipped them to draft the Theory of Change (ToC) and establish Ground Rules. Consequently, the first draft of the ToC was produced and preliminary Ground Rules were established.



Fig. 9 Presentations by co-leads of the MANCOGA project



Fig. 10 Keynote address by Ms. Sivine Jansen, Deputy Ambassador, German Embassy



Fig. 11 Keynote address by Hon. Henry Kokofu, Executive Director, Environmental Protection Agency



Fig. 12 Participants engaged in a world café session during the first stakeholder workshop



Fig. 13 Contribution by a participant during the first stakeholder workshop

3.3.1.2 Field Visit

The purpose of the field visit was to ascertain first-hand knowledge on the nature of the coastline and the coastal defense structures in place as well as identify the different species of mangroves, their distribution and their exploitation rate in the study area. The field visit involved a transect walk, observation and interactions with community members and local stakeholders. The Akplorwotorkor, Dzita and Anyanui communities were selected for the field visits.

The coastal protection structure seen at Akplorwotorkor were identified as groynes. The team noticed that the sea defense wall was inadequate to safeguard the coastline from coastal erosion. At Dzita, white and black mangroves were identified, however, these seemed depleted due to incidences of harvesting without replanting.

The team's final stop was at Anyanui, the primary mangrove marketing center where they saw how mangroves were bundled and stockpiled for sale.

Several lessons were gathered from the field visits which include the following:

- The inadequacy of hard engineering to effectively protect the coastline. Even though there have been various sea defense projects in Ghana, there was evidence of persistent coastal erosion.
- The need for science-based planning of coastal defense structures.
- The dependency of community members on mangroves as a source of livelihood.
- The need for mangrove restoration and alternative sources of livelihood for mangrove dependent community members due to the negative effects of over-harvesting.

The field visit justified the essence of exploring Nature-based Solutions for the effective mitigation of coastal hazards.



Fig. 14 Sea defense structure at Akplorwotorkor in the Anloga District of Ghana



Fig. 15 Erosion observed at the Ada East District of Ghana



Fig. 16 Mangrove market center at Anyanui in the Anloga District of Ghana



Fig. 17 Mangrove Site at Dzita in the Anloga District of Ghana

3.3.2 Second Stakeholder Workshop

The second stakeholder workshop was held virtually on Friday, 14th October 2022 via Zoom. The MANCOGA team however arranged for some community-level stakeholders to participate in the meeting at a specific location due to internet and technical constraints. There were 46 participants in attendance. The purpose of the workshop was to strengthen stakeholder participation and to revise the ToC that was drafted during the initial stakeholder workshop. There were presentations on the following topics: evaluation feedback from the first stakeholder workshop, introduction to the collaboration tool and development of the draft ToC.

Subsequently, participants revised the initial draft ToC based on the two main themes (Alternative Livelihoods and Coastal Protection) that emerged from the first stakeholder workshop.

Participants were further assigned to four breakout sessions to discuss the following themes:

- Enablers to sustainable and alternative livelihoods for mangrove dependent communities
- Barriers to sustainable and alternative livelihoods for mangrove dependent communities

- Enablers to using mangroves as nature-based Solutions as an alternative/ complement to hard engineering solutions
- Barriers to using mangroves as nature-based Solutions as an alternative/ complement to hard engineering solutions.

Upon completion of the breakout sessions, there were several deliberations that led to the revision of the draft ToC.

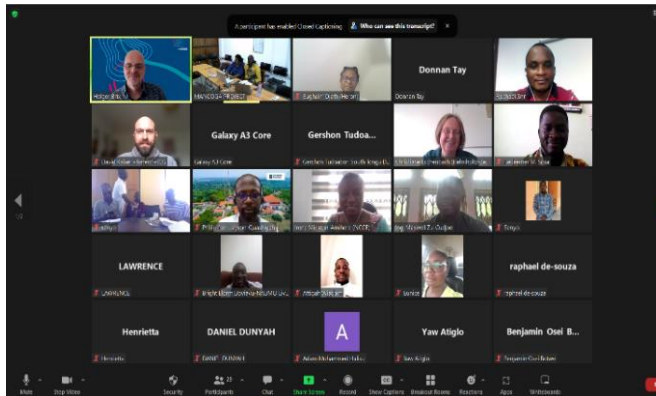


Fig. 18 Virtual second stakeholder workshop



Fig. 19 Community-level stakeholders assembled for the virtual stakeholder workshop

3.3.3 Third Stakeholder Workshop

n2nd November 2022 at the Tomreik Hotel in Accra, Ghana. Fifty-six participants were present at the workshop. This workshop sought to review progress made, plan for future engagements, finalize the ToC and draft the proposal for the implementation phase of the project.

There were presentations on the experiences and achievement of the co-design phase, development of MANCOGA ToC and evaluation feedback from the second stakeholder workshop. Stakeholders participated in two breakout sessions. The first breakout session, comprising five groups, focused on developing the final ToC based on the following themes:

- Data Acquisition
- Coastal Protection
- Mangrove Management Systems
- Digital Twin
- Digital Toolbox

In the second breakout session consisting of three groups, participants deliberated on issues related to the project implementation phase and drafted the implementation phase proposal based on the themes below.

- Stakeholder Engagement during Implementation Phase
- Dissemination and Outreach Strategy
- Impact beyond Academia: Define Criteria for Evaluation

During the workshop, additional activities included the viewing of the MANCOGA trailer video, question and answer sessions, and the completion of evaluation forms.

A final ToC and a draft implementation phase proposal were developed at the end of the workshop. Based on their sense of ownership during the co-design phase, a group of stakeholders led by local stakeholders developed a slogan in their native language (Anlo Ewe) for the MANCOGA Project. The slogan is provided below.

MANCOGA, Mia tœ!

MANCOGA, Mia tœ!!

MANCOGA, Mia'ɣuto, Mia tœ!!!

This translates literally as MANCOGA, our own! MANCOGA, our own! MANCOGA, it is our own.



Fig. 20 Presentations by co-leads of the co-design phase



Fig. 21 Participants engaged in a group work session during the first stakeholder workshop



Fig. 22 Group work output produced during the third stakeholder workshop

4.0 DOCUMENTATION AND DISSEMINATION

One of the most important aspects of any project is the documentation and sharing of knowledge. It is essential because it presents lessons learned and impact stories, as well as serving as a reference for other similar projects. The co-design phase of the MANCOGA project was novel hence, the team ensured proper documentation of all activities and created numerous channels for visibility and dissemination.

4.1 Documentation

4.1.1 Reporting

Activity reports, including reports for all stakeholder workshops, were produced. Minutes of all meetings were also taken. These reports and minutes documented the activities and lessons learned during the co-design phase for efficient monitoring and evaluation.

4.1.2 Project Implementation Proposal

With inputs from stakeholders, a project implementation proposal was developed to guide activities to be undertaken during the implementation phase. The implementation phase is expected to span from March 2023 to February 2025.

4.1.3 Living Product Document

The living product document is a web-based narrative that describes the journey of the co-design phase, including the achievements and lessons learned. Importantly, it presents the perspectives of stakeholders on the use of mangroves as Nature-based Solutions in mitigating coastal hazards, as well as their viewpoints on the co-design approach. It also touches on their expectations for the project and how they intend to contribute to its success.

4.2 Dissemination and Visibility

4.2.1 Creation of Communication Platforms

4.2.1.1 MANCOGA Community Tool (Collaboration Tool)

This platform was created to enable stakeholder interaction on a regular basis and exchange of MANCOGA-related information. Stakeholders were introduced to the community tool during the first and second stakeholder workshops and were assisted to register unto the platform. The link to the community tool can be found below.

<https://hcdc.hereon.de/mancoga>

4.2.1.2 WhatsApp Platform

Based on suggestions from the first workshop, a WhatsApp group was created to improve communication and collaboration among stakeholders, keep stakeholders up to date on the project, and share MANCOGA-related information. Below is a link to MANCOGA's WhatsApp platform.

<https://chat.whatsapp.com/L8OIqs19Az8AMp6RHu04Ux>

4.2.1.3 MANCOGA Twitter Platform (@MANCOGA)

This platform was created to promote and increase the project's visibility and to reach a wider audience.

5.0 ACHIEVEMENTS

MANCOGA has been endorsed as part of the United Nations Decade of Ocean Science for Sustainable Development (2021- 2030) to strengthen marine Nature-based solutions in Africa and is aligned with its goals and objectives.

MANCOGA also made presentations on co-design and Nature-based Solutions at the Geo Blue Planet 5th Symposium in Accra, Ghana, and has an abstract accepted for a presentation at the 2023 European Geosciences Union (EGU) General Assembly as well as the Ocean Visions Biennial Summit in April 2023 in Atlanta, GA, USA, respectively.

6.0 CHALLENGES

Similar to any other project, the co-design phase faced some challenges and they are as follows:

- Some expectations of community-level stakeholders exceeded the project's capacity. They expected the implementation phase to undertake activities such as dredging, livelihood interventions etc.
- Internet connectivity was a major challenge during virtual meetings. Similarly, access to virtual meeting facilities presented challenges particularly to community-level stakeholders. This impasse was however surpassed by assembling and transporting these stakeholders to a venue.
- The custom collaboration tool, which was designed to facilitate stakeholder interactions, had a user interface that differed from the intuitive surface of more commonly used tools but with less functionality (e.g. WhatsApp). This initially challenged the enthusiasm of both the project team and stakeholders, and slowed the uptake by users. During the implementation phase, new content and features will attract more users to the tool.
- There were some stakeholder conflicts or misperceptions about their roles, particularly between some local and national stakeholders. However, the project leads identified these and tried to resolve them by stressing the need for equal partnerships and diversity of ideas.
- The project intended to actively encourage women's representation from the onset of the co-design phase. Despite the fact that the socio-cultural context limited their initial involvement, engagement with stakeholders and deliberate efforts gradually improved female participation toward the end of the co-design phase.
- The project identified certain barriers to sustainable mangrove management. These include a lack of a comprehensive legal framework and enforcement to guide mangrove use and management. The prevailing land tenure system restricts access to land for mangrove regeneration. Though measures are in place to encourage community managed protection as well as traditional bye-laws (e.g. sacred groves) these are inadequate to ensure sustainable mangrove use.

- Traditional livelihoods in some communities are heavily dependent on mangrove exploitation (fuel wood, timber etc.). On the other hand, the presence of mangroves obstructs fishing in lagoons as well as landing sites on beaches leading to the removal of mangroves from their habitat.
- Stakeholders suggested that undertaking mangrove restoration programs require the introduction of sustainable alternative livelihoods which require financial and political backing. Considering the short duration of the MANCOGA project, it behooves us to think of ways to ensure sustainability beyond the duration of the project. The lack of sustained financial support may threaten their sense of ownership of the project.

7.0 LESSONS LEARNED

- Co-design created a sense of ownership among stakeholders particularly, the local stakeholders. Engagement of stakeholders from the planning stages ignited their involvement as they saw themselves as partners of the project rather than spectators.
- Sensitization of community members on the adverse effects of over-harvesting mangroves and the need to seek for alternative sources of livelihood could help curb their reliance on mangroves.
- Hard engineering alone cannot effectively project the coastal line, therefore combining grey infrastructure with Nature-based Solutions could help mitigate coastal hazards.
- There exist social, cultural, economic and political drivers for mangrove use and management. These are context specific and require an understanding of the local context if the trends of exploitation can be reversed.
- Stakeholders at all levels may lack the expertise for advanced IT tools and resources, thus intended interventions should take into consideration the ability of stakeholders to use them. The introduction of new tools or software require a lot of time, training and guidance.
- Deliberate efforts are needed to improve equitable gender and age representation among stakeholders. The project in its implementation phase will consciously involve and engage female stakeholders.
- Other informal and regular personal engagements improve stakeholder participation in workshops and encourages their involvement in the project as a whole.

8.0 CONCLUSION

Overall, the co-design phase was successful. Stakeholders at the national, sub-national and community levels participated actively in the entire progress by sharing their perspectives, experiences and knowledge. For many of the stakeholders and even members of the research team, this was their first time participating in a project through co-design. This was also an

opportunity for stakeholders across the different levels to participate equally in a research project.

Stakeholders learned the principle of equal participation and respect for other people's opinions. The research team, also learned the political ecology of engaging stakeholders to co-design a project on nature-based Solutions to coastal hazards.

Overall, the project team and stakeholders have appreciated the joint collaboration in the design of the project implementation, the anticipated challenges and their possible solutions in the implementation phase.

The co-design process fostered a sense of ownership among stakeholders and exposed the project team to potential issues to be addressed during the implementation stage that is set to begin in March 2023.

APPENDIX I: LIST OF MANCOGA STAKEHOLDERS

No	Name of Representative	Institution
1.	Emelyne Wright-Hanson	Ministry of Environment, Science, Technology & Innovation
2.	Mathias Kumah	Ministry of Environment, Science, Technology & Innovation
3.	Isaac Dakurah	Ministry of Environment, Science, Technology & Innovation
4.	Safiatsu Seidu	Ministry of Lands & Natural Resources
5.	Donnan Tay	Ministry of Sanitation and Water Resources
6.	Geoffrey Tamakloe	Ministry of Tourism, Arts and Culture
7.	Kilan B. Gyador	Ministry of Tourism, Arts and Culture
8.	David Akresi	Ministry of Local Government, Decentralization & Rural Development
9.	Dickson Agyeman	Forestry Commission
10.	Lawrence Kisseh Tetteh-Ocloo	Keta Lagoon Complex Ramsar Site, Wildlife Division of the Forestry Commission
11.	Godwin Yegbe	Forestry Commission- Wildlife Division
12.	Ernestina Larbi-Mensah	Coastal Development Authority
13.	Celestina Deku	Land Use and Spatial Planning Authority
14.	Ebenezer Ntsiful	Land Use and Spatial Planning Authority
15.	Maxwell Zu-Cudjoe	Environmental Protection Agency (Keta)
16.	Theodore Tello Nelson	Environmental Protection Agency (Keta)
17.	Mustapha Adamah	Ghana Maritime Authority
18.	James Aggrey	Water Resources Commission
19.	Eric Muala	Water Resources Commission
20.	Hoenyedzi Godson Kafui	Hydrological Services Department
21.	Eunice Ofoli-Anum	Fisheries Commission
22.	Henrietta Asante-Sarpong	National Commission for Civic Education
23.	Irene Amihere	National Commission for Civic Education
24.	Imurana Mohammed	National Commission for Civic Education
25.	Anthony Adeea Mba	International Union for Conservation of Nature
26.	Raphael De-Souza	National Disaster Management Organization
27.	Bright Elorm Doviavu	National Disaster Management Organization
28.	Ernest Apenkwah	Songor Ramsar Site, Ada
29.	Gershon Kwadzo Tadoabor	South Tongu District Assembly
30.	Wisdom Attigah	Anloga District Assembly
31.	Gideon Marc Nuviadenu	Anloga District Assembly
32.	Lawrence Awunyo	Keta Municipal Assembly
33.	Mohammed Halisu Adam	Ketu- South Municipal Assembly
34.	Faustina Borkloe	Social Welfare Department (Gender Desk)
35.	Togbui Kumassah	Traditional Leader- Anlo State
36.	Togbe Tay-Agbozo	Keta Municipality
37.	Bright Adzagba	Keta Ramsar Centre
38.	Raphel Ahiakpe	Seawater Solutions

39.	John Lumor	Mangrove Planters Association
40.	Kugbe Gershon	Mangrove Harvesters Association
41.	Elisha Abraham Ametepe	Mangrove Transporters Association
42.	Moses Agbenyegah	Mangrove Retailers Association
43.	Samuel Brass Dedzo	Land Owners Association
44.	Redeemer Akosua Fiashiede	Land Owners Association
45.	Vance Kwaku Adedze	Ghana National Canoe Fishermen Council
46.	Lotsu Raymond	Salt Miners Association
47.	Daniel Dunyah	Farmers Association