REPORT

ON

THIRD STAKEHOLDER WORKSHOP OF THE MANGROVES AS NATURE-BASED SOLUTIONS TO COASTAL HAZARDS IN EASTERN GHANA (MANCOGA) PROJECT

2ND NOVEMBER 2022

TOMREIK HOTEL- EAST LEGON, ACCRA

MANCOGA

MEERWISSEN
African-German Partners for Ocean Knowledge

Helmholtz-Zentrum hereon

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

UNIVERSITY OF GHANA

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1.0 BACKGROUND

The third stakeholder workshop of the Mangrove as Nature-based Solutions to Coastal Hazards in Eastern Ghana (MANCOGA) Project took place on Wednesday, 2nd November, 2022 at the Tomreik Hotel in Accra, Ghana. Fifty-six participants were present at the workshop, of which 42 were male and 14 were female. The stakeholders included representatives from Ministries, Departments and Agencies, Non-Governmental Organizations, Civil Society Organizations, the Community-based organisations, and core MANCOGA team members from the University of Ghana and the Helmholtz-Zentrum Hereon in Germany. See **Appendix II** for list of participants.

2.0 OPENING

The meeting commenced at 9:00 am with a brief introduction by participants, this was followed by welcome remarks given by the Co-leads of the MANCOGA project.

2.1 Welcome Address and Opening Remarks by Co-Leads of the MANCOGA Project.

Dr. Edem Mahu, Co-lead of the MANCOGA project for Ghana, welcomed and thanked participants for honouring the invitation to the third and final stakeholder workshop of the co-design phase. She also expressed her profound gratitude to stakeholders for their commitment to the project.

She remarked that the MANCOGA project was one of the few projects that had succeeded in using a bottom-up co-design approach to bring together multiple stakeholders to discuss a matter of shared concern. In addition, she stated that the project had made substantial progress to date and thanked all parties for their contributions.

Importantly, she informed all stakeholders that their ideas and opinions were very relevant to the project and urged them to contact the Project Leads or Project Coordinator if any of them felt left behind at any point. She finally remarked that the MANCOGA will continue to engage with all stakeholders beyond the co-design phase and encouraged them to avail themselves for the implementation phase which will kick in the first quarter of 2023.

Dr. Holger Brix, Co-lead of the MANCOGA project extended a warm welcome to all in attendance and reaffirmed the significance of all project stakeholders. He stated that anyone with a project-related complaint should contact a team member to seek an amicable resolution. He informed participants that the project's co-design phase was nearing completion, adding that the input of all stakeholders was required in drafting the implementation phase proposal which is expected to span the next two years. He welcomed everyone once more and hoped for a fruitful meeting.

3.0 PRESENTATIONS

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

https://drive.google.com/drive/folders/1CI6GiGxeaXdvtqMVU-QNL5OaKCl4c-p-?usp=sharing

1. *Feedback from Second Stakeholder Workshop. Presented by Mr. Senyo Adzah, Research Assistant on the MANCOGA.* This presentation highlighted the evaluation feedback from the second stakeholder workshop, as well as criticisms and suggestions from stakeholders that will guide the team in planning future workshops.

2. *Review of Experiences and Achievements of the Co-design Phase of the MANCOGA Project. Presented by Dr. Christiane Eschenbach and Dr. Yaw Atiglo, Co-leads of the Co-design phase, MANCOGA.* This presentation provided participants with a summary of the MANCOGA project from its inception to date whilst highlighting the experiences, achievements and lessons learnt.

3. *Development of MANCOGA Theory of Change. Presented by Dr. Christiane Eschenbach and Dr. Yaw Atiglo, Co-leads of the Co-design phase, MANCOGA.* This presentation highlighted the overarching goal of the project, the scope and capacity of the MANCOGA project and the potential contribution from stakeholders.

4.0 TRAILER VIDEO ON THE MANCOGA PROJECT

Participants were shown a trailer video on the MANCOGA project which entailed excerpts from the first stakeholder workshop, field visits and interviews of some stakeholders. The link to the video can be accessed using the link below.

https://drive.google.com/file/d/10JgBzX2isl9GEe6GJQXG8Phj6BI2J4x5/view?usp=drivesdk

5.0 MANCOGA SLOGAN

Stakeholders proposed the need for an official slogan for the Project and coined the slogan below for the MANCOGA project.

MANCOGA, Mia tɔe!

MANCOGA, Mia tɔe!!

MANCOGA, Mia'ŋutɔ, Mia tɔe!!!

The slogan, which is in Ewe (a Ghanaian language spoken predominantly within the MANCOGA project areas) translates literally as MANCOGA, our own! MANCOGA, our own! MANCOGA, it is our own.

6.0 DISCUSSIONS

A participant suggested the need for the involvement of more females in the project further stating that it will be also interesting to have socially differentiated responses.

Another participant suggested the involvement of youth groups or the National Youth Authority so that they can integrate the activities and the actions of the MANCOGA project into their national and local planning systems to enable the youth contribute to the climate change resilience and responsiveness we seek to achieve.

A participant highlighted that research conducted in 2021 revealed that there has been a 24% decline in mangrove cover within the Keta lagoon complex Ramsar site, he mentioned that there was no provision in the project objectives for restoration, he called for the restoration of some woodlots and mangrove sites.

One participant expressed concern about how some mangrove species along the Keta lagoon had become extinct over the years and queried if there was a way to restore them.

A participant spoke about some best practices in East Africa; Kenya, where crab rearing is combined with mangrove cultivation, he proposed that mangrove owners be encouraged to include the rearing of crabs and fishes that can thrive among the mangrove forest and explained that by so doing they can generate income, and that could also help minimize the harvesting of mangroves.

The Project Lead of MANCOGA commended the participant for the laudable idea and explained that the original project did not have a work package that was focused on livelihood assessment but with the ideas that we have gathered from the workshop we are planning to have a package that will assess the various alternate livelihoods in the area. Another participant pointed out that the species of crabs in East Africa is not the same as that in West Africa and emphasized the need to be very careful in introducing species into our environment as it may have a negative impact on the environment.

It was proposed to involve school children in the project to ensure sustainability of the project since the future belongs to children. He stressed that bringing children on board to understand and appreciate the importance of conserving mangrove ecosystems and how nature-based solutions can be used in addressing coastal hazards, will help address these environmental challenges.

It was also suggested that MANCOGA should have a business plan with regards to alternative livelihoods to assist in sustaining the project.

A participant mentioned that the issue of climate change needs to be taken into consideration when discussing barriers and enablers to alternative livelihoods. He elaborated that mangrove sequester carbon and that should be seen as an enabler, he spoke about the sea level rise and changes in hydrology that affect the fresh water that comes in to create provisions for mangroves as a barrier.

One of the participants suggested that sensitization and education on mangrove conservation should be done in local dialects so that the impact of the project can be better felt in the communities.

Another participant indicated that females are the most vulnerable gender groups and suggested that they be taken into consideration during the design and implementation phases of the project. He also proposed that the MANCOGA project support women by funding women's livelihood through the construction of ovens for smoking fish thereby easing pressure on the use of mangroves for smoking fish.

It was proposed that rather than duplicating efforts, MANCOGA ought to communicate and collaborate with existing organizations whose sole purpose is on livelihood assessment, so we have a holistic and sustainable project.

7.0 BREAKOUT SESSIONS

There were two breakout sessions. For the first breakout session on finalizing the Theory of Change, participants were assigned into five breakout rooms to discuss the following components of the Theory of Change. Information on the groups and their discussion guides are presented in the Table below.

Table 1. ToC Discussion Groups and Topics

Group	**World Café Topics**
Group 1- Data Acquisition	• Data needs • Potential data sources • Overcoming data barriers
Group 2 – Coastal Protection	• Experiences with erosion • Historical documentation of flooding
Group 3 – Mangrove Management Systems	• Traditional management practices • Benefits and limitations of existing management practices • Potential enablers for sustainable use of mangrove ecosystems
Group 4 – Digital Twin	• Potential dangers/threats that MANCOGA should investigate • Enablers/potentials for positive change
Group 5 – Digital Toolbox	• Questions the tool should answer

After the breakout sessions, each group reported with feedback from their discussions. A summary of group presentations can be found below in **Appendix III**.

For the second breakout session, participants were assigned into three concurrent groups to discuss the issues related to the project implementation phase and drafting of the final project proposal. The group discussions which lasted 20 minutes, were on the following topics:

Group 1- Stakeholder Engagement during Implementation Phase

Group 2 – Dissemination and Outreach Strategy

Group 3 – Impact beyond Academia: Define Criteria for Evaluation

Group rapporteurs presented feedback from their discussions. A summary of these group presentations can be found below in **Appendix IV**.

8.0 CLOSING

The meeting came to a successful end at 3:30pm, this was preceded by a closing remark by Prof Chris Gordon, Senior Scientist MANCOGA and the completion of evaluation forms by stakeholders. See **Appendix V** for evaluation feedback.

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

Prof Gordon mentioned that mangrove management is complicated, emphasizing that there is no one simple solution to it. He also mentioned that all the issues cannot be fixed overnight.

He spoke about the need to have a priority list of what can be done within the project, he also touched on the need to manage expectations explaining that there is a limit to what the project can do. He also stated that there was a need to plan ahead of time for what would happen after the project was completed, such as whether there would be a phase two or phase three.

He spoke about the need to appreciate that the research that will be conducted will provide evidence for decision-making and policy formulation and that implementation of policy is dependent on the ownership of the project outcomes by the local people. He advised that the only way the project can be sustained is when the project is owned by stakeholders.

In his concluding remarks he mentioned that mangroves offer the possibility of a triple win, elaborating that the activities carried out on mangroves can contribute to the development and wellbeing of the people, contribute to adaptation of climate change and mitigation of greenhouse gases thereby satisfying part of Ghana's nationally determined contributions to climate change.

He thanked all participants for their presence and active participation and wished all stakeholders travelling out of Accra travelling mercies.

APPENDIX I – WORKSHOP AGENDA

MANGROVES AS NATURE-BASED SOLUTIONS TO COASTAL HAZARDS IN EASTERN GHANA (MANCOGA) PROJECT
THIRD STAKEHOLDER WORKSHOP
2ND NOVEMBER 2022
TOMREIK HOTEL, EAST LEGON-ACCRA

Time	Session	Facilitator
8:30 – 9:00	***Registration***	
	SESSION ONE	
9:00 – 9:10	Round of Introductions	**All**
9:10 – 9:20	Welcome Address & Opening Remarks	**Dr. Edem Mahu & Dr. Holger Brix** *(Co-leads, MANCOGA)*
9:20 – 9:30	Presentation: Feedback from Second Stakeholder Workshop	**Mr. Senyo Adzah** *(Research Assistant)*
9:30 – 9:40	Trailer Video on the MANCOGA Project	
9:40 – 9:50	Presentation: Review of Experiences and Achievements of the Co-design Phase of the MANCOGA Project	**Dr. Christiane Eschenbach & Dr. Yaw Atiglo** *(Co-leads, Co-design Phase, MANCOGA)*
9:50 – 10:00	Discussions	**All**
10:00 – 10:10	***Group Photograph Session***	
	SESSION TWO – WORLD CAFÉ	
10:10 – 11:10	Develop Final Theory of Change	**Dr. Christiane Eschenbach & Dr. Yaw Atiglo** *(Co-leads, Co-design Phase, MANCOGA)*
11:10 – 12:00	Reporting and Discussions	**Group Leads** **All**
12:00 – 13:00	***Lunch***	
	SESSION THREE – WORLD CAFÉ	
13:00 – 14:00	Topics: • Stakeholder Engagement during Implementation • Dissemination and Outreach Strategy • Define Criteria for Evaluation Impact beyond Academia	**Dr. Christiane Eschenbach & Dr. Yaw Atiglo** *(Co-leads, Co-design Phase, MANCOGA)*
14:00 – 14:15	***Coffee Break/ Questionnaire***	
14:15 – 14:55	Reporting and Discussions	**Group Leads** **All**
14:55 – 15:00	Closing Remarks	***Prof. Chris Gordon*** *(Senior Scientist, MANCOGA)*
15:00	***Departure***	

APPENDIX II - LIST OF PARTICIPANTS

NO	NAME OF REPRESENTATIVE	INSTITUTION	GENDER
1.	Mathias Kumah	Ministry of Environment, Science, Technology, and Innovation	M
2.	Isaac Dakurah	Ministry of Environment, Science, Technology, and Innovation	M
3.	Safiatu Seidu	Ministry of Lands and Natural Resources	F
4.	Ing. Maxwell Zu-Cudjoe	Environmental Protection Agency	M
5.	Theodore Nelson	Environmental Protection Agency	M
6.	Donnan Tay	Ministry of Sanitation and Water Resources	M
7.	Celestina Deku	Land Use & Spatial Planning Authority	F
8.	Ebenezer Ntsiful	Land Use & Spatial Planning Authority	M
9.	Atsu Fumey Nassah	Forestry Commission	M
10.	Eric Muala	Water Resource Commission	M
11.	Lawrence Kisseh Tetteh-Ocloo	Keta Lagoon Complex Ramsar Site, Wildlife Division of the Forestry Commission	M
12.	Ernestina Larbi-Mensah	Coastal Development Authority	F
13.	Mustapha Adamah	Ghana Maritime Authority	M
14.	Hoenyedzi Godson Kafui	Hydrological Services Department	M
15.	Henrietta Asante-Sarpong	National Commission for Civic Education (NCCE)	F
16.	Imurana Mohammed	National Commission for Civic Education (NCCE)	F
17.	Eunice Ofoli-Anum	FSSD- Fisheries Commission	F
18.	David Akrasi	Ministry of Local Government, Decentralisation and Rural Development	M
19.	Kilian B. Gyader	Ministry of Tourism	M
20.	Anthony Adeea Mba	International Union for Conservation of Nature (IUCN)	M
21.	Ernest Apenkwah	Songor Ramsar Site, Ada	M
22.	Gershon Kwadzo Tudoabor	South Tongu District Assembly	M
23.	Wisdom Attigah	Anloga District Assembly	M
24.	Lawrence Awunyo	Keta Municipal Assembly	M
25.	Mohammed Halisu Adam	Ketu- South Municipal Assembly	M
26.	John Lumor	Mangrove Planters Association	M
27.	Kugbe Gershon	Mangrove Harvesters Association	M

28.	Elikplim Ametepey	Mangrove Transporters Association	M
29.	Moses Agbenyegah	Mangrove Retailers Association	M
30.	Bright Elorm Doviavu	National Disaster Management Organisation	M
31.	Redeemer Akosua Fiashiede	Land Owners Association	F
32.	Vance Kwaku Adedze	Chief Fisherman	M
33.	Lotsu Raymond	Salt Miners Association	M
34.	Daniel Dunyah	Farmers Association	M
35.	Bright Adzagba	Keta Ramsar Center	M
36.	Faustina Borkloe	Department of Social Welfare- Keta	F
37.	Togbui Kumassah	Traditional Leader	M
38.	Togbe Tay-Agbozo V	Traditional Leader	M
39.	Edem Mahu	University of Ghana	F
40.	Chris Gordon	University of Ghana	M
41.	Kwasi Appeaning Addo	University of Ghana	M
42.	Francis K.E. Nunoo	University of Ghana	M
43.	Philip-Neri Jayson-Quashigah	University of Ghana	M
44.	Donatus Yaw Atiglo	University of Ghana	M
45.	Senyo Adzah	University of Ghana	M
46.	Antoinette K. Ankrah	University of Ghana	F
47.	Benjamin Botwe	University of Ghana	M
48.	Andy Agyekumhene	University of Ghana	M
49.	Mario Boateng	University of Ghana	M
50.	Belinda Aniama Asabiah	University of Ghana	F
51.	Furdaus A-Hussien	University of Ghana	F
52.	Jonas Dzeble	University of Ghana	M
53.	Holger Brix	Helmholtz-Zentrum Hereon, Germany	M
54.	David Kaiser	Helmholtz-Zentrum Hereon, Germany	M
55.	Christiane Eschenbach	Helmholtz-Zentrum Hereon, Germany	F
56.	Bughsin’ Djath	Helmholtz-Zentrum Hereon, Germany	F

APPENDIX III – SUMMMARY OF FIRST BREAKOUT SESSION

Word Café session 2 – Theory of Change

Group 1: Data acquisition

<table>
<tr><td colspan="2">Activity: Data Acquisition
Databases
Reports
(Local) Research projects
Other sources</td></tr>
<tr><td colspan="2">Potential Stakeholder Contribution:
Provide data
Lobby for sharing data
Estimation of data quality (expert review)</td></tr>
<tr><td>Data Needs
Demography
GIS data
Mangrove ecosystem
Mangrove chain
Water and soil quality</td><td>Secondary Data Sources
Internet sources
Environmental Protection Authority
ForC
Coastal Development Authority
Ghana Hydrological Services</td></tr>
</table>

Group 2: Coastal Protection

<table>
<tr><td colspan="2">Activity: Coastal Protection (Erosion & Flooding)
Additional (field) measurements, e.g. grain size
Data quality control
Mapping of coastal types</td></tr>
<tr><td colspan="2">Potential Stakeholder Contribution:
Historical data (incl. historical satellite images)
Drone data (citizen science)
Anecdotal reports
Any data on waves (reality data)</td></tr>
<tr><td>Flooding & erosion data sources
C2R-CD Project
MMDAs (NADMO)
Environmental Impact Statement (Keta Sea Defense Project)
Universities (UG, UCC)
IUCN Project
Hydrological Services Department
Environmental Protection Agency (EPA)
Media
Works Department</td><td>Experiences
2021 Tidal flooding e.g. Anloga, Keta & Ketu South districts
2021 Tidal flooding and erosion in Ada
Communities flooded in Anloga: Dzita, Agorkedzi, Fuveme, Atiteti, Whuti,
Communities flooded in Keta: Kedzikope, Abutiakope, Dzelukope
Communities flooded in Ketu South: Horvi</td></tr>
</table>

○ UCC-CCM ○ Library ○ Ghana Maritime Authority ○ Ghana Meteorological Agency ○ DECCMA Project ○ Coastal Development Authority ○ MESTI/WACA Project ○ A-Rocha Ghana ○ The Development Institute ○ Volta River Authority ○ Conservation International ○ Oil Watch Ghana ○ FoN ○ Ghana Ports and Harbours Authority	

Group 3: mangrove management systems

Activity: Mangrove Management Systems • **Ecosystem services, e.g. carbon storage** • Literature review • Mapping of mangrove types • Develop Carbon lab	
Potential Stakeholder Contribution: • Data, like harvesting, resource use, • mapping data, • Knowledge on mangrove policy • Support field work	
Traditional mangrove management • Management by families under clans and family heads/traditional heads • Mangroves considered as sacred plants • Family ownership • Project ownership • Harvesting of mangroves ○ as and when ○ for economic benefits	
Benefits ○ Ownership is well-defined ○ Preservation ○ Coastal protection ○ Source of livelihoods ○ Boosts the growth of other wildlife ○ Tourist sites ○ Flood control ○ Habitat for flora & fauna ○ Biodiversity conservation ○ Boost the growth of fish	• **Mangrove restoration (replanting)** • **Enablers** ○ Alternative livelihoods ○ Introduction of strict traditional laws ▪ Traditional laws/bye-laws ○ Management structures ▪ Proper management structures in the community ○ Sanctions ○ Education and sensitization

○ Conservation of mangrove ○ Carbon sequestration ○ Improve water quality • Limitation ○ Long growth period ○ Encroachment ○ Overexploitation ○ Limited research sampling (limited access) ○ Livelihoods to be affected ○ Taste and preference ○ Social vices	○ Capacity building ○ Citizen science ○ Data ▪ Oral tradition ▪ Forestry commission ▪ Fisheries commission ▪ Research work/academia ▪ Wildlife division ▪ Community members/ leaders/ opinion leaders ▪ Municipal assembly

Group 4: Digital twin

Activity: What / If scenarios • Modelling approaches ("Digital twin")	
Potential Stakeholder Contribution: • Potential risks • Data quality check • Validation of results	
• Ban on mangrove harvesting in certain areas • Community appreciation of waste separation • mangrove harvesting/extraction rate/cycle • Enablers ○ Flooding minimized ○ Education needed on mangrove planting to cover the growing areas ○ Tourist influx ○ Salinity/water quality ○ Topography/sediment quality ○ Education and sensitization ○ Communities looking forward to flooding being addressed ○ Lagoon dredging ○ Plant mangroves at banks of lagoon (Keta)	• Dangers ○ Climate change ○ Overexploitation ○ Flooding and coastal erosion ○ Loss of economic and livelihood activities ○ Nature of the land ○ Environmental activities that destroy water bodies ○ Sand winning ○ Other conflicting land use activities ○ Water intrusion from ground at the coast (fresh/salt water) ○ Knowledge on poor waste management practices and its effect on flooding ○ Outbreak of water related diseases (malaria, diarrhoea) ○ Water pollution (refuse disposal into water bodies) ○ Data on topography

Group 5: Digital toolbox

Activity: Facilitate data usage

- Software tools

Potential Stakeholder Contribution:

- Define contents & functionality
- Usability tests
- Long-term sustainability

Issues to be addressed by the Digital Toolbox

- Digital map of water quality in mangrove area
- Pictorial/visuals showing local ecological knowledge and their applications
- Illustrate effect of salinity levels of areas/soils on mangroves
- Interactive tool for Trainer-of-Trainers (ToT) to track real time changes in mangrove areas
- Consider existing publications (data)
- Inform on sustainable mangrove management
- Time-series analyses of effect of encroachment on mangrove areas
- Identify species of mangrove suitable for particular area
- Identify institutions with crucial data and work with them
- Digital museum to exhibit importance of mangroves
- Visualization of the effects of mangroves overtime
- Monitor occurrence of tidal waves
- Prioritize all aspects of mangrove ecosystems
  - Livelihoods
  - Trees and other species
  - Functions/importance
- Advocacy targeting women and children
- Visualizations of mangroves and their functions (Using interactive pictures/videos/maps)
- Capture improvements of MANCOGA Project to mangrove restoration

Data and information should not only consider one aspect of mangroves but all/several, from plants, animals to livelihood. The toolbox should help prioritize, weigh, and reduce dimensionality of ecosystem aspects for improved management.

Data from publications should be summarized to create information.

The toolbox should facilitate the use of data collected by authorities.

Women and children are now targeted and educated via pictorial fliers, posters, cinema vans.

These "fixed" contents could be supplemented by a toolbox in which the educational material is dynamic and the user can change elements to see reactions of elements on a screen. The lack of internet connection and even smartphones can be addressed by targeting and collaborating with existing organizations, who could provide access.

The toolbox could output potential monetary benefits to a mangrove owner by changing the business, e.g. from selling for cutting to loaning for beekeeping. The input would be e.g. the available space and an alternative use together with a timeframe, the output would be the monetary value. The value could then be compared to earnings from current practice to

facilitate business decisions. Alternatives should include birds as indicators for fishing locations, tourism potential.

The toolbox should allow to visualize the (gps) location of different ecosystem components, e.g. nesting birds. Like a mini GIS program.

The toolbox should visualize the effects of mangroves against erosion, with a time component. E.g. a map figure of the coast with forcing over n days and absence/presence of mangroves. This is close to what Holger had in mind, when the input data is from the digital twin?!

The toolbox should make people understand the benefits of keeping mangroves – inform sustainable management.

The toolbox should show effects of encroachment (by humans) and increasing population, and the resulting pressure on resources.

The toolbox should provide information lobbying for the protection of family/clan ownership of mangroves against nationalization.

The toolbox should output time series of monitoring/survey data by showing trends, summaries and other data mining aspects. This should include evaluating the effects of MANCOGA measures.

The toolbox should help determine the right time for different mangrove related business activities, e.g., for harvesting (seeds), or transporting for export. This should consider tidal data and salinity.

The toolbox should be able to identify the ideal mangrove species for any given location.

The toolbox should be so flexible as to allow live updates to be made by those local community members who use the mangrove resources. This could include the (capacity) training of local "tool-managers".

We could provide computer training in general, so that the use of the toolbox is feasible for more people.

Experiments could determine the "best" mix of wood sources for smoking fish and still retaining the desired qualities. The results could feed a toolbox that outputs a relative quality depending on the mixture of smoking materials.

APPENDIX IV – SUMMMARY OF SECOND BREAKOUT SESSION

Session Three: Developing Proposal for Implementation Phase

Group 1: Indicators of success

Success	Indicator
Increase in mangrove area	Hectares of mangrove
Improve awareness on the importance of mangroves among children	Number of children involved Number of schools involved
Increased involvement of women in mangrove management	Number of women Number of women groups
Increase in species (biodiversity)	Biodiversity index
Sustainability of project	Project activities continued by communities
Visible signages with other mangrove initiatives	Network of mangrove actors created
Improvement in income of households who depend on mangroves	Increased engagement in differentiated livelihoods
Collaboration with other agencies	Network of stakeholder working group Network of mangrove actors created
Community mobilization	Number of children involved Number of women groups involved

Group 2: Dissemination and Outreach

Target groups	
Fishmongers Fishermen Mangrove growers, harvesters retailers, transporters Traditional authorities CBO NGO FBO District Assembly National and regional public institutions	
Method	**Frequency**
Periodic reports	Quarterly
Trainer of trainers (ToT)	Once or twice early on
MANCOGA Slogan	Now
Townhall meetings	Quarterly
Radio Stations	
Newsletters	
Souvenirs/merchandise	
Creative arts (competitions)	
Social media (prim. FB)	

Jingles	
Community information centers	
Documentary (video) shows – mangrove edutainment	Quarterly
Association meetings	Variable
Signposts, posters, fliers	Soon, once
Messages during engagements	
Durbars	
Website	
Media conference	
Stationary (notepads, pens etc)	
Role play	
Pectoral presentations	
District/national level workshops	
School clubs	
C2C – snowball	
Influencers	
Information during festivals	

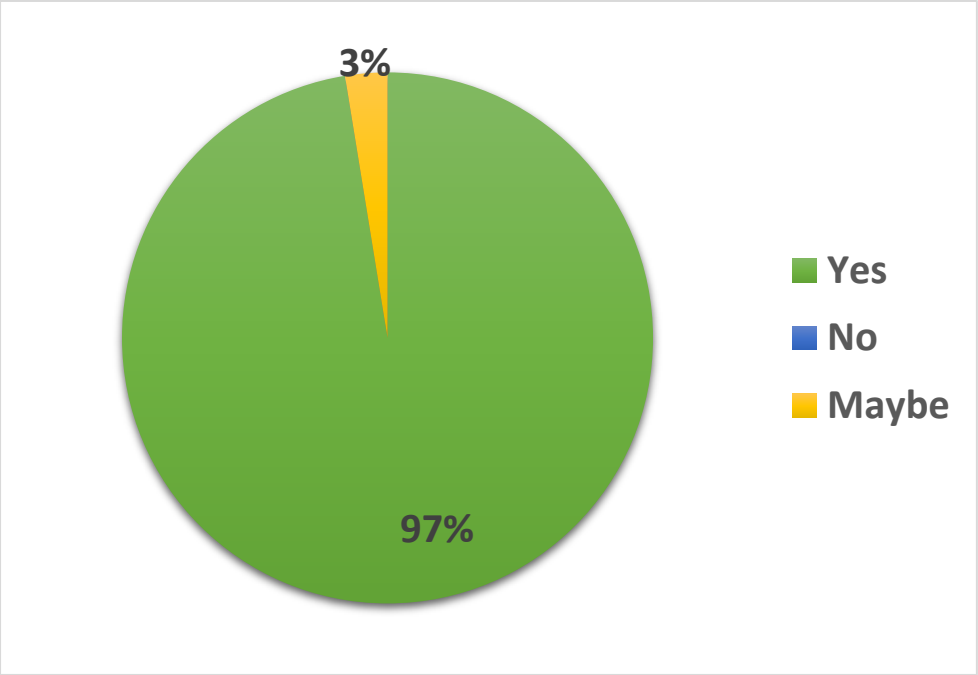
Group 3: Impact beyond academia

Tools	Quarterly meetings (community level) Biannual meetings (national level) Virtual/physical (WhatsApp, phone calls)
Commemoration of international world mangrove day	
Ambassadors	
Introduction of mangrove festival in mangrove growing communities	
Digital portals for sharing ideas	
Public address systems	
Radio stations	
Durbar	
Awards for mangrove farmers Essay competitions for students	

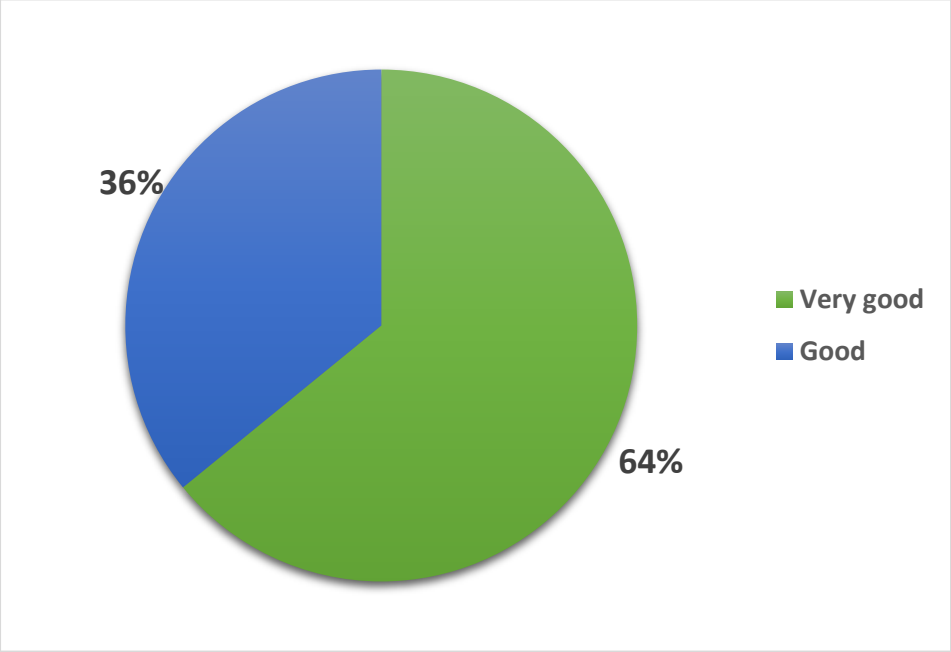
APPENDIX V – EVALUATION FEEDBACK

Below is a graphic illustration of the evaluation feedback.

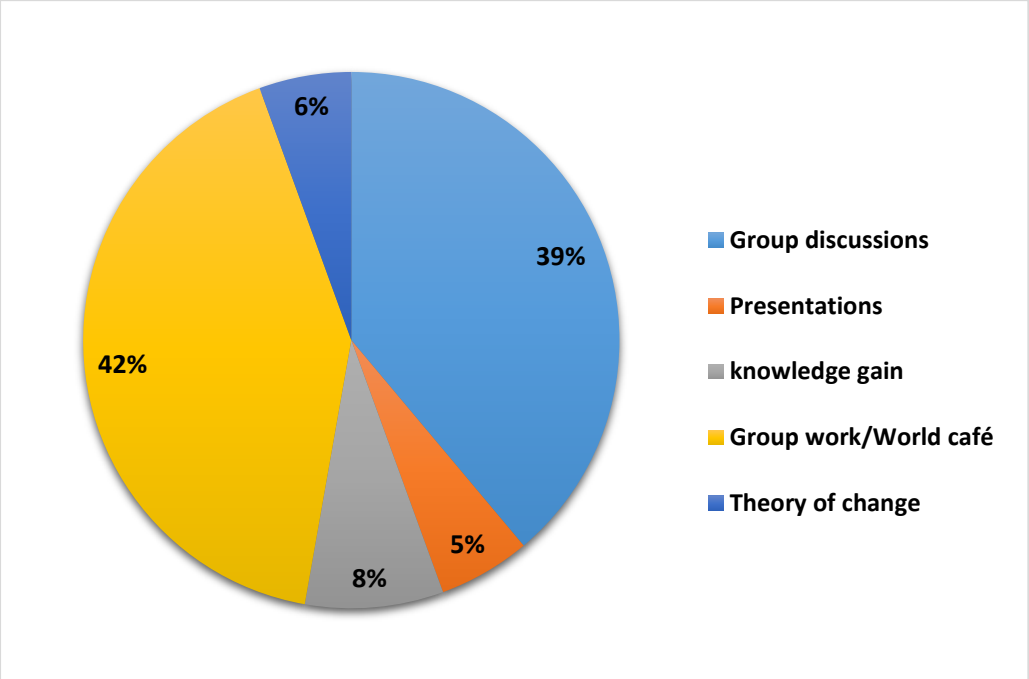
Did the workshop meet your expectations?



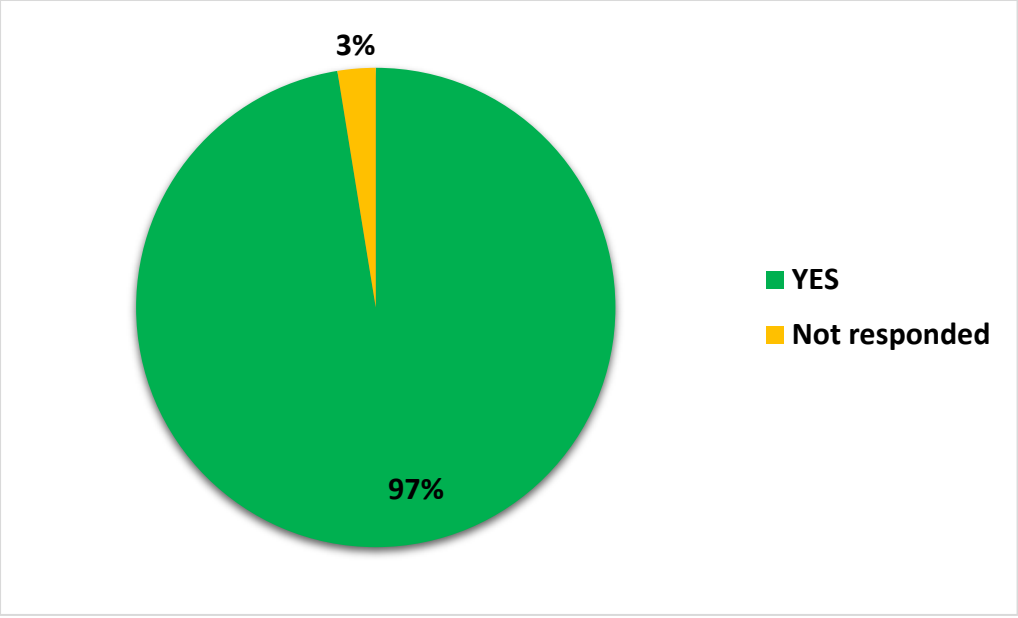
How useful was the workshop?



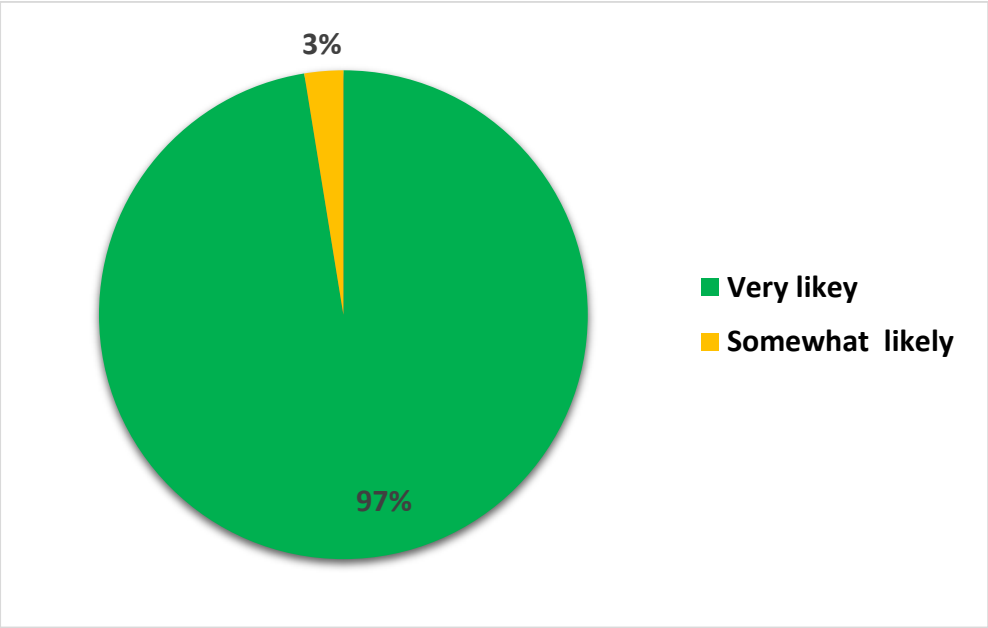
What was your favourite experience or moment of the workshop?



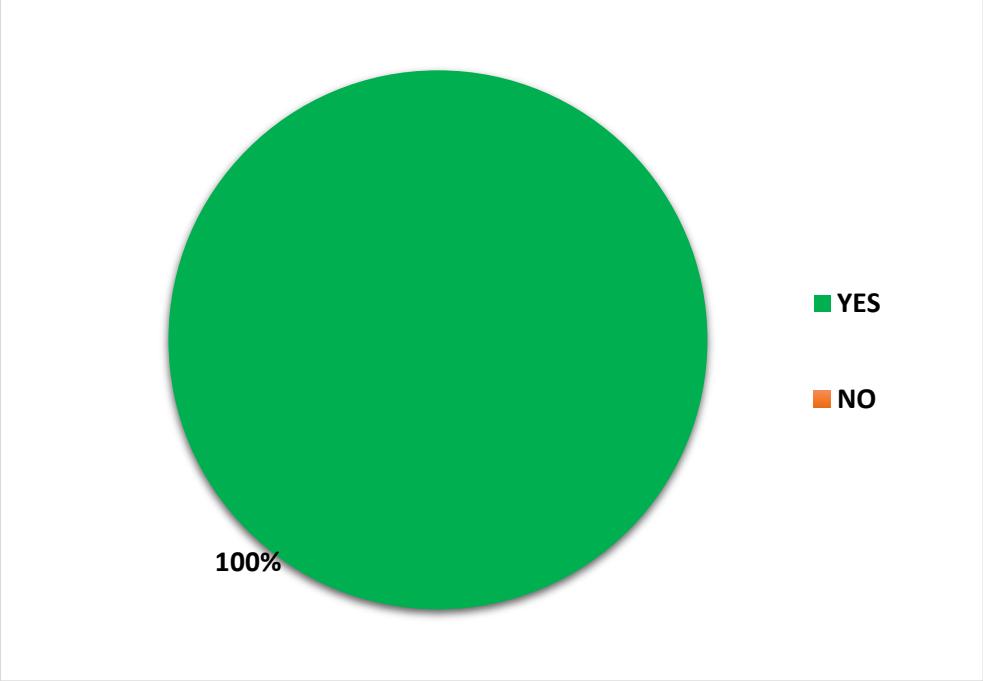
Did you have an opportunity and place to ask questions, give input, and participate?



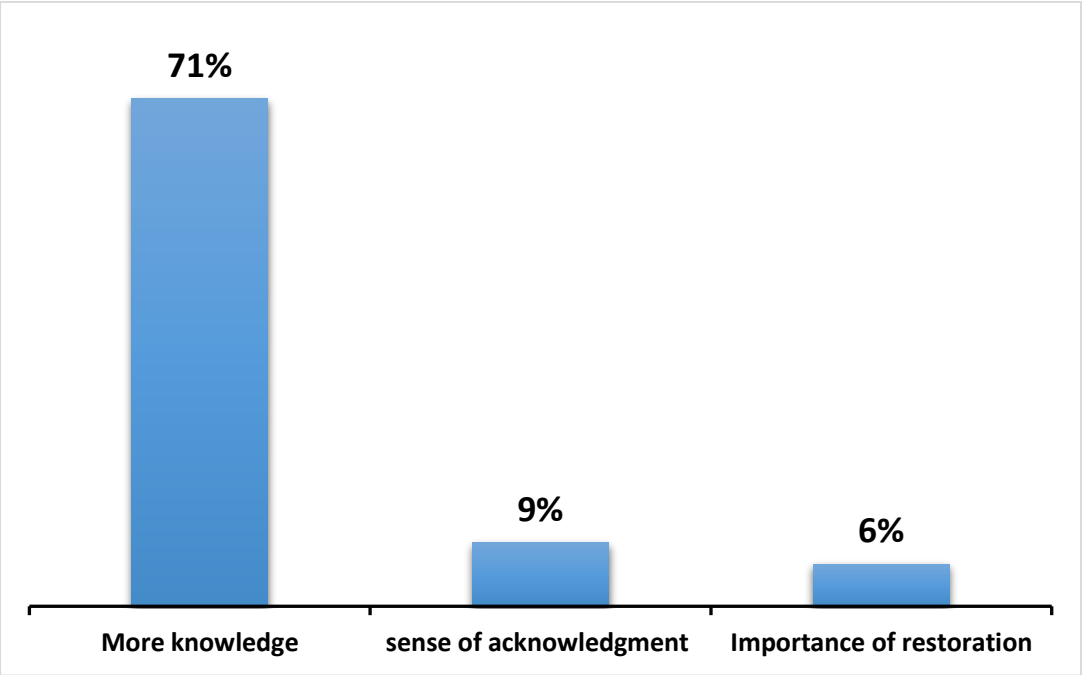
Based on your experience at this workshop, how likely are you to attend future workshops?



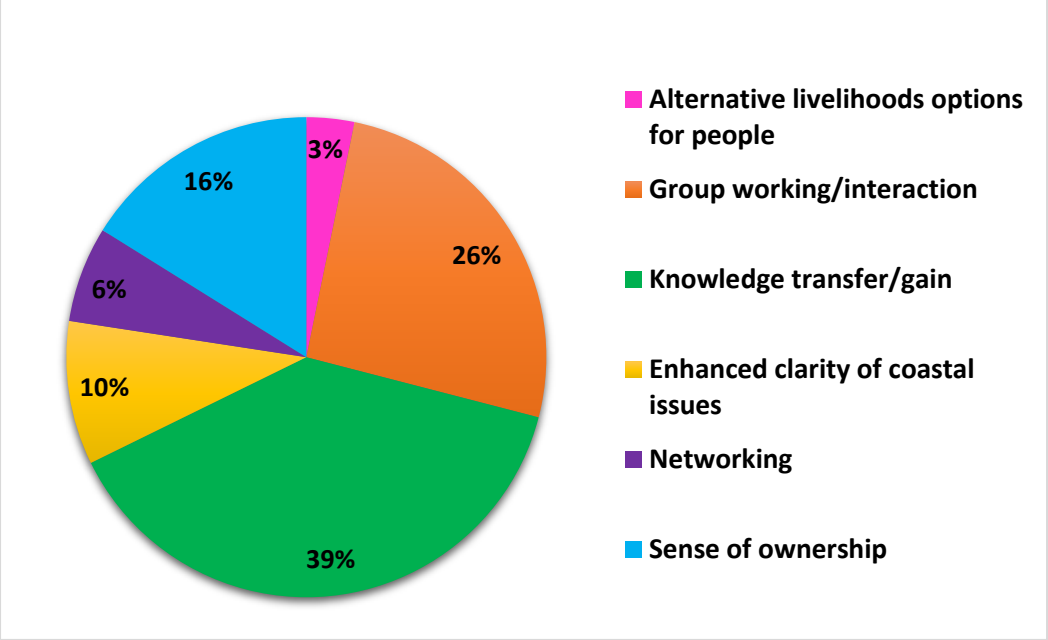
Do you like the co-design approach?



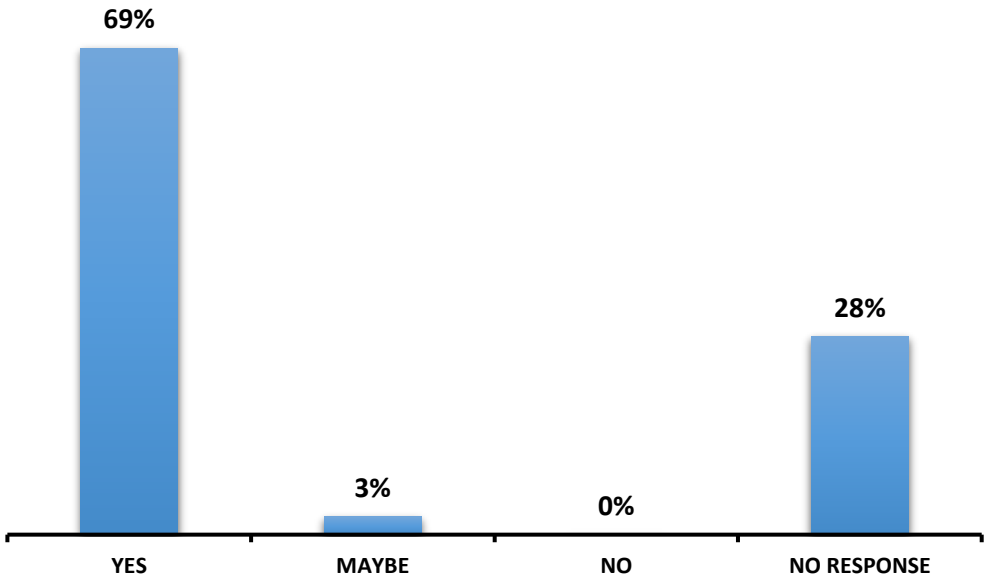
How has the co-design phase impacted your perception of mangroves as nature-based solutions?



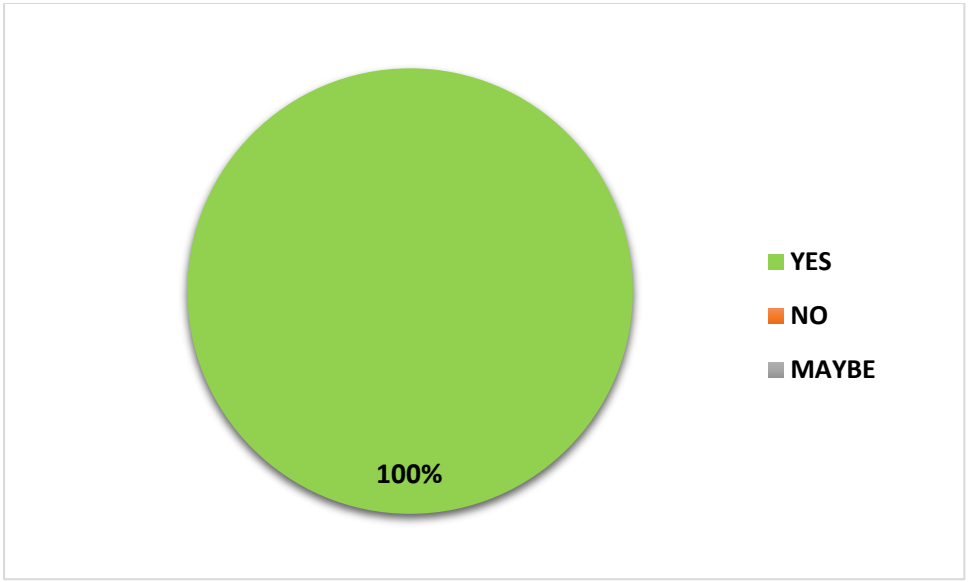
What was your biggest take away from the MANCOGA co-design phase?



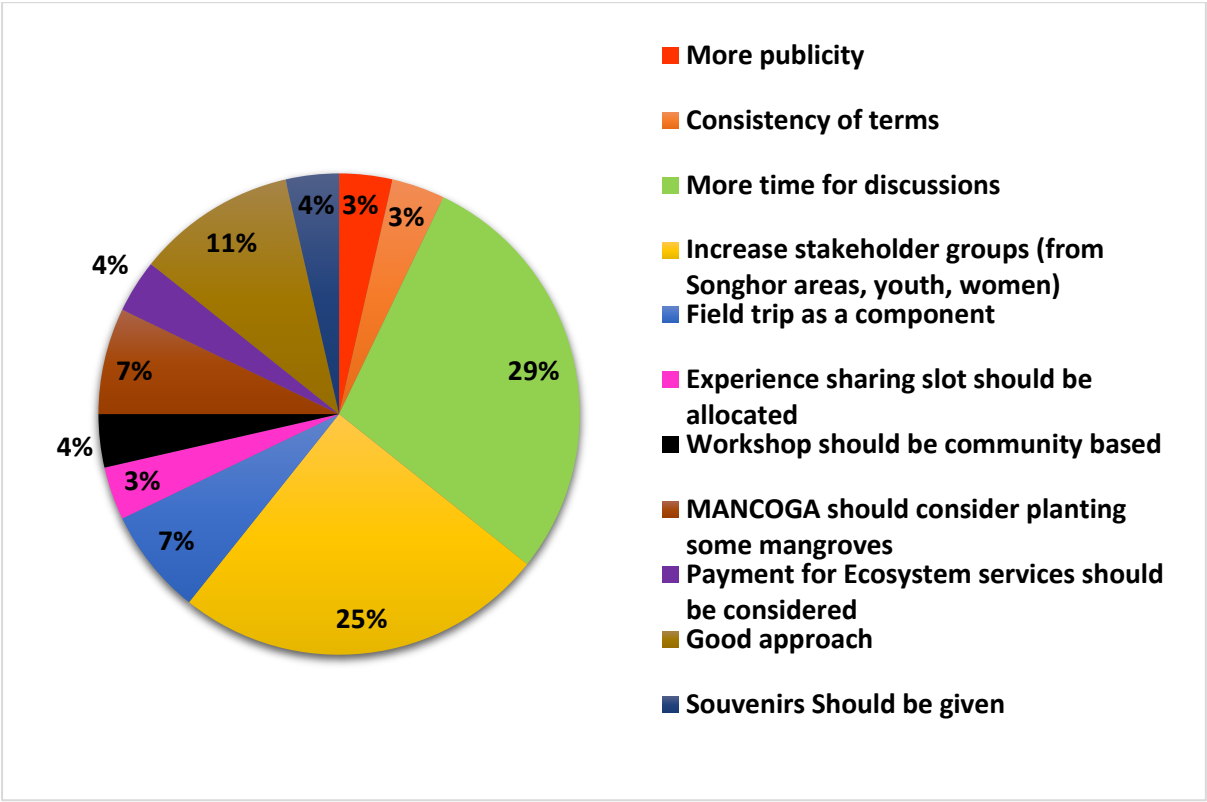
Were your comments/feedback addressed?



Would you recommend our MANCOGA workshops to a colleague?

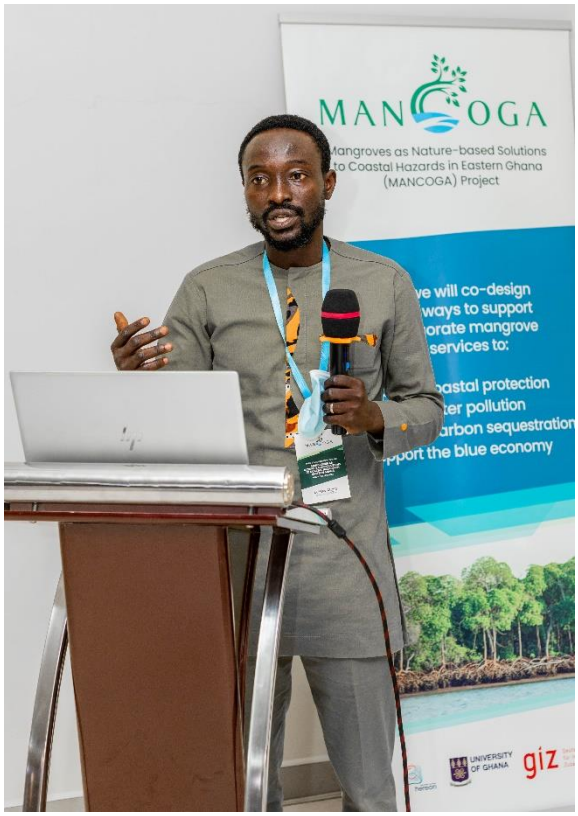


What could we improve on? What would have made this workshop better?



APPENDIX VI – PICTURE GALLERY

The Co-Leads of the MANCOGA Project delivering a welcome remark at the third stakeholder workshop



Presentations by the Co-Leads of the Co-design Phase

A stakeholder participating in discussions during the workshop

A stakeholder participating in discussions during the workshop

Workshop participants engaging in a group work session

Workshop participants engaging in a group work session

An output from the group work sessions

A group photograph of participants at the third stakeholder workshop