UNIVERSITY of CAPE COAST

10 ANNIVERSARY 2013-2023

3rd CONFERENCE ON FISHERIES AND COASTAL ENVIRONMENT

CENTRE FOR COASTAL MANAGEMENT | CFCE 2023 | BLUE.ECONOMY

Theme:
"Inclusive Blue Economy in Africa: Towards Sustainable Transformation and Resilience of the Marine Environment"

Venue: Mensvic Hotel, Accra Ghana
Date: 6th- 8th November, 2023.
Time: 8:00 am (GMT) Each Day
#CFCE2023
#3rdCFCE
#BlueEconomyConference

REPORT

DECEMBER 2023

Contact:

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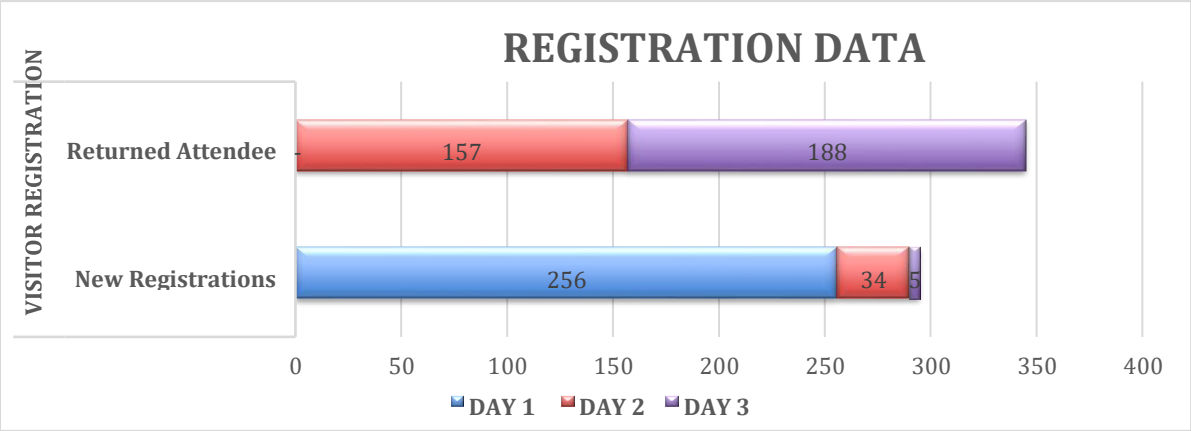
EXECUTIVE SUMMARY

The Centre for Coastal Management – Africa Centre of Excellence in Coastal Resilience (CCM-ACECoR), University of Coast (UCC) as part of its 10th Anniversary organised the 3rd edition of the Biennial Conference on Fisheries and Coastal Environment (CFCE), with the focus on the Blue Economy from the 6th to 8th November 2023. The conference themed, "Inclusive Blue Economy in Africa: Towards Sustainable Transformation and Resilience of the Marine Environment" was designed to strengthen policy linkages and enable researchers, journalists, and think tanks to include their voices in developing the Blue Economy of Ghana.

The CFCE 2023 was made possible by the generous support of the World Bank, the American people through the United States Agency for International Development (USAID)/Feed The Future, West Africa Coastal Areas Project (WACA), The UK government through the Ocean Country Partner Programme (OCPP), African UnionInterAfrican Bureau for Animal Resources (AU IBAR), Vulnerability to Viability Global Partnership, Danish International Development Agency (DANIDA), Solving Sustainability Challenges at the Food Climate Biodiversity Nexus, Future Earth Coasts, Resilient Lagoon Network, University of Waterloo, The University of British Columbia, Technical University of Denmark, University of Liverpool, The University of Rhodes Island, Centre for Maritime and Security Africa Ghana, The Environmental

Protection Agency of Ghana, with support from the Government of Ghana through the SDG Advisory Unit.



The conference consisted of two plenary sessions and four parallel sessions with keynote presentations, panel discussions, open fora, and scientific presentations. It was attended by 290 participants (in-person) and 207 (online), drawn from more than 15 African countries and beyond. The composition of participants included government ministries and agencies, private sector and civil society, nongovernmental organisations, academia, research institutions, fisheries associations, multilateral and developmental institutions, donor agencies, and the media.

Majority of participants were from Ghana (86), Kenya (4), whereas countries such as Benin, Malawi, and the United Kingdom had two persons each. All other countries had a single participant at the CFCE 2023. The various sessions were attended participants as enumerated below:

SESSIONS	**No. of Attendees**
Socio-Economics & Coastal Development 2 (W.K Omari Hall)	14
Sustainable Fisheries Resource Management in Ghana 2 (Ntiamoah Hall)	50
Renewable & Non-renewable Energy Resources (Swens Hall)	17
Sustainable Fisheries Resource Management in Ghana 2 (Ntiamoah Hall)	90
Coastal Process, Infrastructure and Sediments Dynamics 2 (Che Yong Hall)	0
Marine Pollution & Management (Akiyo Tato Hall)	27
Socio-Economics & Coastal Development 1 (W.K Omari Hall)	24
Coastal Process, Infrastructure and Sediments Dynamics 1 (Che Yong Hall)	25

Socio-Economics and Coastal Development - Aft5ernoon - (W.K Omari Hall)	23
Emerging Blue Economies in Africa - Afternoon - (Mensah Hall)	21
Meeting with Media Group - Afternoon - (Efua Amenua Hall)	23
Sustainable Fisheries Resource Management in Ghana (Morning) - Ntiamoah hall	75
(Scientific Session 1): Sustainable Fisheries Resource Management in Ghana - Morning (Goto Hall)	9
Coastal processes, infrastructure, and sediments dynamics - Morning - (Che Yong Hall)	17
Ocean Governance and Marine Protected Areas - Morning - (Swems Hall)	19
Emerging Blue Economies in Africa - Morning - Mensah Hall	19
Bilateral knowledge exchange meetings between the Tanzanian delegation and Ghanaian Fisheries Stakeholders - Afternoon - (Che Yong Hall)	17
Socio-Economics and Coastal Development - Morning (W.K Omari Hall)	17
Marine Pollution and Management - Morning - (Akiyo kato Hall)	26
(Scientific Session 2): Sustainable Fisheries Resource Management in Ghana - Afternoon _(Goto Hall	21

In the CFCE 2023, a total of 42 parallel scientific oral presentations and 27 poster presentations. Below are parallel scientific sessions held during the conference:

NO.	TOPIC	PRESENTER
Coastal Processes, Infrastructure and Sediment Dynamics		
1	Co-designing mangroves as nature-based solutions to coastal hazards in Eastern Ghana	Senyo Adzah
2	Modelling the morphodynamics of Fuveme Beach within the Volta Delta, Ghana	Nanabanyin Kwame Okwentsie Ekumah
3	The impact of climate change on children's rights to food and health in marine small-scale fishery communities in the Volta Region of Ghana	Sulley Ibrahim
4	Estimation of sediment flux along the coastline of Ghana	Godwin Ofosu Tutu
5	Morphological responses of the nearshore bed to coastal defence structures: A case study of Elmina and Anomabo in Ghana	Emmanuel Klubi
6	Land-Use and Land Cover change analyses to reveal recent (2002 – 2022) degradation of mangrove forests along the coast of Ghana, West Africa	Bernard Assiam

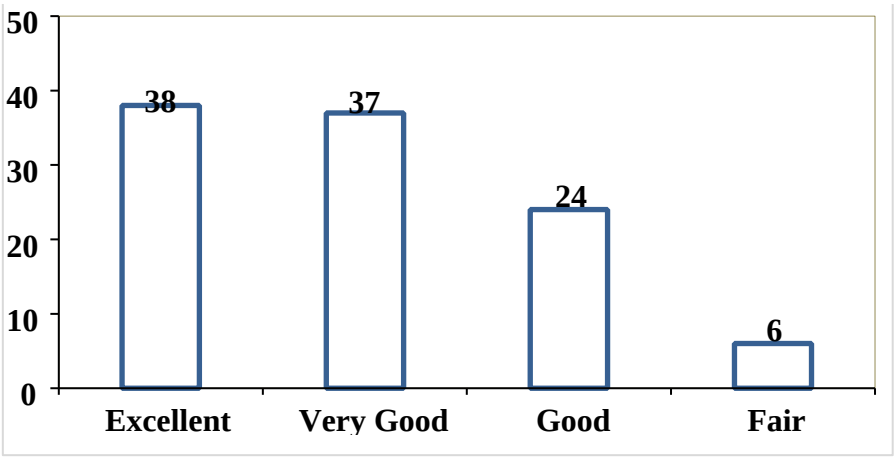
NO.	TOPIC	PRESENTER
7	Mapping mangrove vegetation for biodiversity restoration and conservation in Ghana and the Gambia.	Kennedy Muthee
Marine Pollution and Management		
1	Assessment of environmental degradation in two coastal communities of Ghana using Driver Pressure State Impact Response(DPSIR) framework	Charles Abimbola Faseyi
2	Impacts of small - scale coastal construction on nearshore ecosystems along the Central Coast of Ghana	Eunice Ofoli-Anum
3	An integrated water quality index for monitoring estuarine ecosystem health in Ghana	Dorothy Lukhabi
4	Potential impact of antifouling paint on marine copepods	Justice Yeboah
5	Impacts of climate change and pollution stressors on the diatom *Thalassiosira weissflogii* adapted to tropical estuarine conditions	Rael Adhiambo
Socio-Economics and Coastal Development		
1	Coastal hazards mapping for an informed adaptation decision making in the rural communities of Ghana	Richard Adade
2	Assessing the sustainability of wetland-based livelihoods in the Keta Lagoon complex Ramsar site (KLCRS) of south-eastern Ghana	Prince Prah
3	Implications of future rainfall variability simulated under selected shared socioeconomic pathways (SSPs), for the Keta Basin of Ghana	Precious Mattah
4	Social capital factors and post-cyclone Idai food insecurity among households in Beira Mozambique	Naomi Elikem Sunu
5	Community perceptions, knowledge, and coping mechanisms on perennial climate change-related disasters in the Volta estuary of Ghana, West Africa	Mattah M. Memuna
6	Seasonal variations and health risk assessment of microbial contaminations of groundwater in selected coastal communities of Ghana	Grace Emuobouvie Ayeta
7	Assessment and Spatialization of Vulnerability of Benin Coast to Sea Level Rise using Composite/Blended Approach (Gis, Rs and Socioeconomic Surveys)	Sèna Donalde Dolorès Marguerite Deguenon
8	Social resilience and demographic characteristics of coastal communities in Ghana: Implications for the blue economy	Abdul-Wakeel Karakara Alhassan

9	From Vulnerability to Viability: Navigating transitions and pathways in small-scale fisheries	DerekArmitage, Prateep Nayak, Ella-Kari Muhl

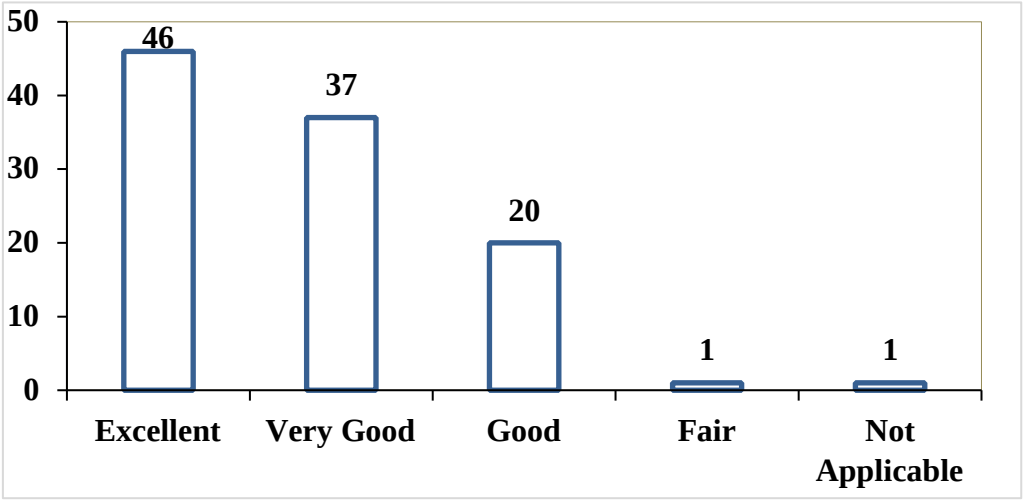
NO.	TOPIC	PRESENTER
10	Migrating between vulnerability and viability: Iterative movements intrinsic to the internal dynamics of SSF under drivers of many orders.	Aliou Sall
11	Vulnerability factors of fishing communities to climate change and response strategies in the Commune of Dionewar, Saloum Delta	Clément Sambou
12	Small-Scale Fisher Transitions in Response to Climate Variability: Case of Lake Chilwa Malawi	Vannessa Warren
13	Examination of Seaweed from Vulnerability to Viability in Nigeria	Kafayat Fakoya
14	Is Blue economy development an opportunity for reducing vulnerabilities of small-scale fishers in Tanzania	Julius Francis
15	Role of Fishing Rights, Legal Recognition, and the political economy in the Transition from Vulnerability to Viability for Small-Scale Fisheries in South Africa	Mafaniso Hara
16	Transitioning from Vulnerability to Viability: The Position of Fisher Folk on the Abolishment of Premix Fuel Subsidies in Ghana	Vinolia Pitris Pawar
Emerging Blue Economies		
1	Exploitation of cetaceans and their socio-economic drivers: A case study of Ghana	Elizabeth Agyekumwaa
2	Reviewing the environmental assessment process, production trends, and opportunities for coastal aquaculture development in Ghana.	Sheila N.A. Ashong
3	Evaluation of local microalgal isolates as feed for hatchery production of West African Mangrove Oyster.	Eric Appiah Krampah
4	Efforts to rid Ghana's seas of abandoned and discarded fishing nets: A transformational agenda to convert waste nets to useful products	Dr. Edna K. Quansah
Sustainable Fisheries Resource Management in Ghana		
1	Assessment of premix fuel governance and the relationship between premix fuel supply and fish catch in the small-scale marine fisheries sector in Ghana.	Vinolia Pawar

2	Piloting of a sustainable, community-based methodology for oyster landings data collection.	Lauren Josephs
3	Illegal, Unreported and Unregulated (IUU) fishing along the West Coast of Africa	Joshua Atta Adjei
4	Evidence gathering at sea using advanced technology: The case of the "DASE" mobile application	Edna Ekua Kwansima Quansah
NO.	**TOPIC**	**PRESENTER**
5	Bacterial and fungal loads of the Atlantic chub mackerel during the cooling period of the postsmoking phase: An explorative study.	Cynthia A. Adinortey
6	Parasites of *Sardinella maderensis* as potential biological tags for stock identification along the coast of Africa (Benin and Ghana)	Abdou Matinou Ogbon
7	Spotlighting women-led fisheries livelihoods as a conduit for sustainable coastal ocean governance: A case of the estuarine and mangrove ecosystembased shellfisheries of West Africa	Ernest Obeng Chuku
Ocean Governance and Marine Protected Areas		
1	Decision support for coastal lagoon management in Ghana, West Africa	Rebecca Kyerewa Essamuah
2	A Management Framework for the Sustainability of Lagoons in West Africa	Sian Davies-Vollum
3	Institutional and Regulatory Gaps, Challenges and Future Prospects	David Asumda

Plenary and breakout sessions were rated on a five-point scale ("Excellent" to "Poor") for various aspects including institutional relevance and overall conference organization.



Relevance to participants' institution



Overall organization of the conference

Key areas for improvement identified by conference participants include:

- Time allocation
- Internet connectivity
- Accommodation
- Gender equality in panelists
- Food arrangement
- Translation of languages
- Medical emergency service
- Transportation

From organization to engaging discussions, the conference received positive feedback across all aspects. Participants valued the diverse perspectives, wellmanaged sessions, and the rich mix of expertise that fueled informative and interactive exchanges on crucial blue economy topics.

The communique developed and presented on the 3rd day of the conference called on all stakeholders and institutions to implement the moratorium, small scale fisheries prioritised, reduce overcapacity, implement MSP, improvement of involvement of coastal communities, promote data quality, strengthen collaboration, mobilise resource capacity, promote knowledge sharing platform. The next Conference on Fisheries and Coastal Environment is proposed to be hosted in 2025 in Tanzania.

INTRODUCTION

The Centre for Coastal Management – Africa Centre of Excellence in Coastal Resilience (CCM-ACECoR), University of Coast (UCC) as part of its 10th Anniversary organised the 3rd edition of the Biennial Conference on Fisheries and Coastal Environment (CFCE), with the focus on the Blue Economy from the 6th to 8th November, 2023. The conference themed, "Inclusive Blue Economy in Africa: Towards Sustainable Transformation and Resilience of the Marine Environment" was designed to strengthen policy linkages and enable researchers, journalists, and think tanks to include their voices in developing the Blue Economy of Ghana.

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The conference which was on the theme "Inclusive Blue Economy in Africa: Towards Sustainable Transformation and Resilience of the Marine Environment" deliberated on topical areas that fall under eight thematic areas namely;

1. Sustainable Fisheries Resource Management in Ghana

2. Coastal Processes, Infrastructure, and Sediment Dynamics
3. Socio-Economics and Coastal Development
4. Marine Pollution and Management
5. Renewable and Non-Renewable Energy Resources
6. Maritime Transport and Security
7. Ocean Governance and Marine Protected Areas
8. Emerging Blue Economies in Africa

In addition, were other side events

9. Closed session on bilateral knowledge exchange
10. Exhibition
11. Closed meeting with media on "Documenting the Human Narrative".

DAY ONE- 6TH NOVEMBER, 2023

Moderators:

Caleb Kudah, Citi TV: Akosua Sackey: DPA-UCC


Caleb Kudah Akosua Sackey

Opening:

The conference was open at 9:00 am after the arrival of H.E. Vice President: Dr. Mahamudu Bawumia and his entourage.

Welcome Address:

Prof. Rosemond Boohene, the Pro-Vice Chancellor welcomed guests and participants on behalf of the University of Cape Coast, where she underscored the importance of the conference on the chosen theme: "Inclusive Blue Economy in Africa: Towards Sustainable Transformation of the Marine Environment". She called for partnership among various stakeholders across all sectors of the Blue Economy including research in order to advance the desired inclusive growth and sustainability.

Prof. Rosemond Boohene, the Pro-Vice Chancellor, University of Cape Coast

Purpose of Conference:

Prof. Denis Worlanyo Aheto, the Director of AECoR, presented the purpose of the 3rd biennial CFCE. He highlighted the Blue Economy as Africa's future driver of growth. He enumerated threats militating against this potential growth as ocean use conflicts,

maritime crime, climate change, marine pollution among others. He reminded the conference participants that the 3rd CFCE is to underscore the importance of sustainable governance of the ocean, prospects of the Blue Economy, explore and reduce ocean use conflicts, reduce maritime crime, marine pollution, and explore the value chain of the Blue Economy

He reminded the conference about the various sub-themes under which this year's is organised:

He further noted that the conference agenda was placed within African Union Blue Economy strategy.

Professor Denis Worlanyo Aheto, Director of CCM-ACECoR

Opening Address:

H.E. Dr. Mahamudu Bawumia, the Vice President of the Republic of Ghana, gave the opening address and commended ACECoR and the University of Cape Coast for organising the conference. He also highlighted the importance of oceans for ecosystem services particularly in fishing, transport, trade, tourism and livelihood, while highlighting the contribution of the sector to Ghana's GDP as 4 -10 %.

He identified among others, challenges such as Illegal, Unregulated, and Unreported (IUU) fishing, pollution, Sea Level Rise (SLR), that pose threat the growth of the Blue Economy

He therefore called for a collective action towards the marine ecosystem restoration some of which the government of Ghana has been doing:

1. Ghana's joining into the UN Ocean Panel following which the country held the Blue Economy summit on 31st May – 1st June, 2023 under the theme: Our Oceans: Our health; Our Prosperity; Our Planet's Security
2. West Africa Coastal Areas programme against climate change impacts
3. Combating IUU through licensing and regulation of foreign vessels
4. Automation of premix fuel dispensary to avoid politicisation and diversion
5. Reduction of artisanal boats in support of ocean sustainability

Dr. Bawumia highlighted the need for increased investment in research, human capital development, and Marine Protected Areas (MPAs), and renewed ocean stewardship to promote tourism, biodiversity restoration, climate change mitigation, and knowledge sharing. He concluded that the Blue Economy is equally a moral imperative and not only an economic opportunity for Africa. He expressed interest in attending the commissioning of the Oceans Institute at the University of Cape Coast on November 10, 2023.

The Vice President of Ghana, Dr. Mahamudu Bawumia Addressing the Participants of the CFCE

Musical Interlude:

Seprewa player- Centre for African Studies, UG

Solidarity Message:

Nana Joojo Solomon, the President of the National Canoe Fishermen Council gave a solidarity message to the conference. He appreciated the efforts of the government by way of the closed season, premix fuel sale digitisation and port infrastructure. He proposed collaboration and effective good policies to realise an inclusive and sustainable Blue Economy since "before the emergence of the Blue Economy, smallscale fisheries have long been with us."

Nana Joojo Solomon, the President of the National Canoe Fishermen Council

Keynote Address:

Dr. Precious Dzogbe Mattah introduced the keynote speaker of the conference, Prof. Rashid Sumaila. The speaker delivered his address on the conference theme, supporting the Vice President's proposition that "Inclusive Blue Economy for Africa is Possible". He commended the enviable leadership of the director of ACECoR, Prof. Denis Worlanyo Aheto.

He noted that fisheries are freely mobile natural resources across continents which must be protected because human engagements with the environment positively and negatively affects the ocean ecosystem. He categorised the Blue Economy into two: living and non-living ocean resources of which both categories include market and non-market services that interplay.

Dr. Precious Dzogbe Mattah, Deputy Director of CCM-ACECoR

Prof. Sumaila called for increased funding for the oceans protection since it is too big a space to receive little funding, and added that the oceans are crucial to livelihood through the infinity fish principle that makes fish a more valuable resource than diamond. He thus called for the need to tackle overtaking and over pollution.

He called for an effective valuation of fisheries resources to ensure effective use of public funds and not over harmful subsidies.

He also advocated for human resource capacity building and equal opportunities for women and girls towards an inclusive Blue Economy. He finally introduced participants to fellowship opportunities available in the Africa-UBC Fellows Initiative together with Prof. Daniel Pauly for African scholars to foster oceans and fisheries sustainability studies. He appealed for donations to support the project.

Prof. Rashid Sumaila Director of the Fisheries Economics Research Unit at the UBC Institute for the Oceans and Fisheries

Photo Session:

The moderators ended the plenary session and made way for the photo session and coffee break at 10:05 am.

Plenary Session:

The plenary session was moderated by Caleb Kudah, Citi TV, Ghana. Remarks were received from key partners on interventions and the way forward on Blue Economy initiatives globally.

Ms. Michelle Keane, Operations Manager at the World Bank (for Ghana, Liberia, Sierra leone) delivered an address on the topic: World Bank's Blue Economy Strategy.

Your Excellency, Mr. Mahamudu Bawumia, Vice President of the Republic of Ghana

Dear Professor Johnson Nyarko-Boampong, Vice-Chancellor of the University of Cape Coast

Distinguished guests,

Let me first start by congratulating His Excellency President Nana Addo Dankwa Akufo-Addo for his government's commitment to the Blue Economy. Ghana's role in making **SDG 14** a reality should motivate all of us to redouble our efforts in promoting healthy oceans and building resilient coastal livelihoods.

I would like to convey our enthusiasm at the remarkable development of ACECoR, the Africa Center of Excellence for Coastal Resilience.

ACECoR has become a leading institution and a beacon of learning and innovation for the entire region. It is equipping future generations with essential knowledge and skills for:

- the transformation towards Blue Food and Blue Jobs. WHILE
- safeguarding the health of coastal ecosystems, and
- propelling the sustainable Blue Economy forward.

ACECoR was established just five short years ago with initial IDA financing, which is managed by the World Bank. In that brief span of time, it has blossomed into an institution whose influence resonates on a global scale. We celebrate its exceptional achievements and transformative journey. Thank you for hosting this conference.

As you are all aware, the global Blue Economy has been undervalued and underappreciated for many years. But today, more than ever, we recognize the indisputable opportunities that oceans, marine life, and coastal landscapes offer for transformational change. Let me give a few examples of the importance of oceans:

- The OECD estimates that by 2030, the economic value of oceans will amount to 3 trillion dollars, with maritime and coastal tourism accounting for the largest share - 26 percent.
- The FAO estimates that around 60 million people are employed worldwide in fishing and fish-farming. Most are in developing countries and are small-scale, artisanal fishers. Most post-harvest workers are women.
- In 2018 (our most recent estimate), global fisheries and aquaculture amounted to almost 180 million tons from which 3.3 billion people get 20 percent of their average intake of animal protein.

Not only is the Blue Economy essential to the World's future, it is key to poverty reduction, prosperity, growth and sustainability in Africa. The Blue Economy is one

of the main drivers of the continent's economic and sustainable development, generating activities worth 300 billion dollars in 2018 and supporting nearly 50 million jobs.

The African continent's oceans and seas serve as a vital resource for livelihoods and food security, an undeniable cornerstone of life and sustenance. Also, beyond these immediate benefits, the sustainable management of oceans and seas will play a pivotal role in the World's success in addressing the challenges to people's livelihoods caused by climate change.

The Blue Economy's contribution to a prosperous future for Africa depends on the continent's ability to, ***first***, fully explore and capitalize on the countless opportunities it presents and, ***second***, on the responsible stewardship and sustainability of Africa's critical costal-marine living resources.

Supporting the sustainable and resilient development of blue economies is part and parcel of the WB's new vision statement announced by World Bank President Ajay Banga at the Annual Meetings of the World Bank and the IMF barely a month ago: to create a world free of poverty and shared prosperity – **on a livable planet**.

To achieve a livable planet, the Blue Economy must be an integral part of our efforts towards poverty reduction, shared prosperity, and climate resilience.

To achieve a livable planet, oceans need to be healthy and productive to secure food and nutrition and create lasting jobs for today's generations, while ensuring that future generations will also thrive and prosper.

Let me say a few words about Ghana, where productive **fisheries** provide jobs and incomes to 10 percent of the population and account for 60 percent of animal protein consumption.

Ghana is also blessed with some of the world's **most beautiful coastal areas and most spectacular coastal sites**.

However, the 5.5 million people who call Ghana's 550-kilometer shoreline home, many of which depend on a productive and healthy marine environment, also face significant challenges:

- Overfishing is a risk to people's livelihoods.
- 80% of the coastline is at high risk of coastal erosion and flooding. In some areas, the coast is eroding at a rate of 4 to 12 meters per year.
- Sea level is projected to rise by 16.5 cm by 2050 and by 34.5 cm by 2080.
- Flooding could severely impact coastal settlements, coastal livelihoods, marine ecosystems, and biodiversity.
- Per year, coastal degradation (flooding, erosion, pollution) costs Ghana 4% of GDP. Costs in other West African Countries' costs range from 2.5 to 7.6% of GDP.

The World Bank's recent Country Climate and Development Report for Ghana recommends developing a **blue economy framework to protect people and their livelihoods and better manage coastal zone ecosystems and assets.**

I cannot speak of flooding today without conveying the World Bank's sincere empathy and concern for the suffering of close to 40,000 people who have been impacted by the recent floods, chiefly along the Volta River. The World Bank stands ready to support the Government of Ghana in its response, based on the needs being identified and in coordination with others.

In the longer term, developing a sustainability and risk management strategy for the Volta River and Delta among other areas will be crucial to determine where it is safe for people to live and how they their livelihoods can be sustained and grow along the river, supported by a healthy ecosystem.

We hope the Government and its partners will take full advantage of the $150 million dollars approved by the World Bank for Ghana under the West African Coastal Areas Program (WACA) This financing is expected to become available very soon, after Parliamentary approval. The WACA project in Ghana will protect coastal communities from erosion and flooding, introduce Blue Carbon finance for mangrove protection and restoration, and create a collaboration platform with civil society to incorporate grassroots solutions and ensure that the needs of communities are heard and reflected in all project activities.

In closing, our hope is that the examples given here will inspire us all to redouble our efforts in Ghana and on the broader continent and give the Blue Economy the place and attention it deserves, as a significant contributor to greater economic opportunities for all, better jobs, especially for women and youth, and a sustainable climate resilient future.

I will now pass the word to Peter Kristensen, the World Bank's Lead Environmental Specialist and Blue economy expert, to share with you some of the achievements to date of the WACA Program and to outline the new Blue Economy for Resilient Africa Program, BE4RAP.

Thank you all for your attention and your engagement on this important topic.

Ms. Michelle Keane, Operations Manager at the World Bank

Dr. Peter Kristensen, World Bank- Environmental Specialist under the WACA programme also gave the speech below on the World Bank's Blue Economy Strategy.

"Thank you, Michelle!
Honorable audience. It is a true pleasure being with all of you today, and especially in Accra where I used to live a decade ago. My colleague Michelle spoke to you about the global opportunity of the blue economy, and the mission of the World Bank.
I will speak about how we at the World Bank support countries' coastal-marine and blue economy efforts to make them a reality.

Let me start by speaking about the ***West Africa Coastal Areas Management Program****, or WACA as we call it, and its achievements so far. The idea of WACA dates back to 2015. While our team engaged on a disaster risk management project in Togo, the government asked us to come out to the coast and see the coastal erosion issue. We saw the now infamous image: water wells standing over 2 meters above the sand where people's houses had been lost to coastal erosion. Long story short: we recognized that coastal zone management solutions are complex, multi-sectoral, regional, costly, and that no-one could solve the coastal erosion problem alone. The World Bank operational response was WACA – the West Africa Coastal Areas Management Program. It aims to strengthen the resilience of coastal communities and areas in Western Africa. The Program was launched in 2018.*

Today, nine countries are now engaged through investment projects: In the west we have Mauritania, Senegal, The Gambia and Guinea-Bissau, and in the Gulf of Guinea we have Côte d'Ivoire, Ghana, Togo, Benin, São Tomé and Príncipe. In addition, the West African Economic

and Monetary Union (WAEMU) through a World Bank grant is convening regional institutions.

WACA is financed using WB Investment Project Financing with a total of half a billion dollars in IDA credits and grants, $20 million of GEF grants, and in Ghana, a $5 million PROBLUE grant. Other financing partners are contributing in parallel, including France, Spain, The Netherlands, the Nordic Development Fund, and Japan. They provide knowledge/solutions, finance/instruments, and help on dialogue/engagement.

In each of the nine countries, WACA projects build infrastructure to manage coastal erosion and flooding, including nature-based solutions. And while WACA does not work on fisheries management, support is provided to coastal fishing communities through social projects that strengthen and diversify livelihoods.

At the regional level, WACA is supporting the State of the Coast monitoring with the Center for Ecological Monitoring of Dakar (CSE), the UNEP Abidjan Convention protocols on mangroves, oil/gas, coastal zone and pollution. We are working with ECOWAS on the plastic pollution challenge, following a series of flagship reports on the economics, circular economy and extended producer responsibility. And latest, we are working on a "Prospectus for Blue Carbon" in West Africa with several organizations, including IUCN, and private sector investors.

The WACA program has been successful because it builds on what countries and regional partners were already doing and thereby was to accelerate and bring solutions to scale.

But let's talk results. Allow me to give the example of the cross-border work between Togo and Benin on coastal protection. As you can imagine, coastal management is regional integration challenge. For example, whatever Togo would put in place would inevitably affect the coast of Benin. A cross-national ministerial coordination and a technical committee was established to oversee the joint climate modelling and engineering scenario analyses. The chosen solution consists of groynes, beach replenishment, wave-breakers, coastal dune and a 21 million cubic meter "sand-motor" which distributes beach sand alongshore with natural coastal currents. The completed cross-border works is managed under one joint works contract of US$63 million led by Benin and a supervising engineer contract of US$5 million led by Togo.
And here are the results that have been achieved so far over the 42 km of coast:

- *Over 27 thousand households (or about 167,000 thousand people) are now less exposed to coastal erosion and flooding.*
- *Over 27 thousand hectares of natural habitat in the coastal zone has been restored.*
- *Almost 4,200 people benefitted from social subprojects (of which 75% are women)*
- *And 4,600 full time jobs have been created.*

Combined in the nine participating countries there are 30 sites where we are counting similar results.
The WACA "ecosystem of partners" has also made transformative progress across multiple sectors – on a Sustainable Ports Program, and in supporting education and science (that is ACECoR!). Please go to www.wacaprogram.org to explore all the stories of the program. So that was the example of WACA in West Africa.

Now let me turn to the African continent. With the achievements of WACA, and with similar experiences in East Africa and North Africa, we are now bringing the regional approach to the continent. At COP27 last year, we announced the ***Blue Economy for Resilient Africa Program****, in short BE4RAP. So, what is the BE4RAP?*

- *The BE4RAP is a new World Bank Program designed to accelerate the blue economy on the African continent.*

- *The aim is to create* ***"blue jobs"*** *and enable* ***"blue food security"****. To achieve this aim, BE4RAP will support countries in managing coastal-marine areas, so these ecosystems stay healthy and productive for generations to come. I look forward to hearing from you if you think the thrust of blue jobs and blue food resonate well!*

- *BE4RAP supports existing initiatives, e.g., Morocco's Africa Continent Blue Belt Initiative, and country and regional strategies in the Indian Ocean, Atlantic Ocean, Mediterranean Sea, and Red Sea. Like WACA, the aim is to catalyze existing initiatives, so BE4RAP will complement the work of the African Union, UNEP's Regional Seas, and other organizations working on the blue economy. In West Africa, it will operate via WACA and national blue economy projects.*

In terms of blue economy solutions, for COP27, we published a series of ***"Operational Briefs"*** *examples country or region-led projects from across the continent and, financed by World Bank. You can see these briefs at the World Bank booth at this conference, and on worldbank.org/be4rap . Let me tell you about a few examples relating to* ***Blue Jobs*** *and* ***Blue Food*** *from ongoing projects:*

- ***The Cabo Verde Resilient Tourism and Blue Economy Development Project****. In this project tourism and fisheries value chains have been integrated because tourism is a new source of demand for fish. This has led to improving the sustainability of fishing practices, sanitary conditions of fish processing, and facilitated access to markets for communities. The project is also now targeting deep-sea demersal fish, and traceability/certification processes.*

- ***The Morocco Blue Economy "Program-for-Result"****. In Morocco, coastal areas contribute 59 percent of GDP and provide 52 percent of jobs in the country. The fisheries sector alone contributes 1.5 percent of GDP and provides 700,000 direct and indirect*

jobs. The project supports the government's target to create an additional 450,000 jobs in maritime fishery and the agri-food industry within five years. The project targets aquaculture farming (mariculture) which has the potential to upscale production with new financing.

- ***In the Gulf of Aden** (Egypt, Sudan, Djibouti, and Somalia) a project provides enhanced data quality and brings knowledge to fishing operations so fishing becomes more sustainable and more lucrative for those that rely on its catch. The project also establishes platforms for capacity building, coordination, citizen and private sector engagement. All of this aims at supporting livelihoods.*

I invite you to explore the many other solution areas and examples of World Bank financed project in the briefs, which cover the following themes:

- *Climate Change*
- *Sustainable Fisheries*
- *Marine Pollution*
- *Biodiversity*
- *Marine Spatial Planning*
- *Developing Institutions*
- *Knowledge & Data*
- *Financing Instruments*

We also took a look at the future, or "New Frontiers". We think that changing the growth trajectory of blue economies in Africa toward a sustainable and resilient path will require innovation on several areas:

- ***Technological innovations**—from satellite monitoring and early warning systems to artificial intelligence and quantum computing—need to be at the core of Africa's future Blue Economy.*
- ***Scientific and research partnerships** are needed to understand the current and future state and trends of the coastal and marine environment, and the projected impacts of climate change. Scientific understanding needs to be translated into solutions at a faster pace. ACECoR and its exemplary work on research partnerships with numerous global institutions – many represented here today - stands as a shining example in this field, and we hope they will bring this experience to BE4RAP.*
- ***New methods to meaningfully connect communities, businesses, and governments** are needed to co-create sustainable local solutions.*
- ***Innovative Financial instruments that mobilize additional resources from the private sector** and leverage government resources and donor funds, and a supportive regulatory framework to reach global climate and carbon funds will all be needed to achieve success.*

Going forward we will need collaboration and partnerships to better utilize scarce assets effectively and ensure their sustainability for the long run.
For the BE4RAP, the World Bank is looking two tracks of work:

- *The first one is support to **Partner-Driven Platform(s)** for coordinated and programmatic approaches to scalable solutions. Here, the WB engages with finance and aims to bring along donors and partnerships.*
- *The second is the **"Accelerator"** where the Bank based on its own pipeline of projects, is identifying opportunities to inject additional blue economy elements.*
- *Through these two tracks, BE4RAP can have a **truly catalytic impact** on sustainable blue economy development, accelerate financing faster than would be possible otherwise.*

Before I close, I hope the overview I gave of WACA and its results demonstrated that countries are achieving important impact on resilience of coastal populations and livelihoods.

*As I explained, the BE4RAP has a drive for **blue jobs** and **blue food**, with examples of solutions that can be explored the Operational Briefs we have available in the booth.*
*And with that, I want to emphasize the World Bank's commitment to the Blue Economy, and through that, contribute to its new mission to **create a world free of poverty – on a livable planet**.*

A final point, for you in Ghana, your entry point for working with the World Bank on the blue economy is via the WACA Project, led by Ministry of Environment, Science, Technology and Innovation, with the Ministry of Works and Housing and the Ministry of Lands and Natural Resources, and the many partners they are engaging.

Thank you again for having invited the World Bank to this conference. Come find us at the booth where we also have documentation and reports available.
Thank you!"

Dr. Peter Kristensen, World Bank- Environmental Specialist

Plenary Panel Discussion- Moderated by Caleb Kudah:

Panel:

1. Prof. Rashid Sumaila, University of British Colombia, Canada
2. Prof. Nana Ama Browne Klutse, Associate Prof. Physics and Climate Change, University of Ghana and Member, IPCC into climate science research
3. Mr. Richster Nii Amarh Amarfio, National Fisheries Association of Ghana, Fisherman and Blue Economy Governance Consult and Fishermen Advocate
4. Dr. Rebecca Kyerewa, Senior Research Officer, CEMLAWS, Ghana

Below are discussion points:

What is missing in Africa's sustainable Blue Economy strategy?

Richster: highlighted the missing link as marine ecosystem restoration. He advocated for a rethink of waste water engineering and treatment systems. He indicated that waste water contributes to declining fish stock *Are we ready for the Blue Economy (BE)?*

Prof. Sumaila: Readiness of BE benefits can only be assessed through right leadership and right initiatives. He believes Africa is ever ready.

Prof. Browne: called for the need for more research beyond socio-economic issues to climate science which would be useful for IPCC and COP

How can the impact of climate change on fisheries be mitigated?

Richster: Need for Marine Spatial Planning (MSP) for hydrocarbon industry and encourage education at all levels in fisheries commission *What are others doing right?*

Prof. Sumaila: "Introduction of young fishermen in smart fishing in Asia. Support for engineering innovation through nature-based solutions"

How can local communities be made to appreciate climate change and ocean protection issues?

Dr. Kyerewa: Ensuring transparency on state-side interventions to get local communities' acceptance

Richster: Awareness creation on the marine environment from preschool to higher institutions. Deal with resource use conflicts to make people directly responsible for what they own.

Final Remarks:

Prof Sumaila: "Conservation is an indigenous concept". He called for moral stewardship towards the ocean: "walk on planet as if it feels pain"

Participant Questions and comments:

1. Mr. Obina Alonzi, AU-IBAR: Proposed for the elevation of Blue Economy discussion from regional to continental level

2. Prof. Joseph Aggrey-Fynn, HoD-DFAS: What assurance is given to artisanal fishers as regards job security in the Blue Economy?

Response:

Richster: There is need to reclassify the fisheries sector to reduce the large numbers and spread them across sub-sectors. Creation of enabling environment for education to co-exist with fishing trade in local communities

PARALLEL SESSION

Sub- Theme: Coastal processes, infrastructure and sediments dynamics This session had three (3) scientific oral presentations.

The first part of the parallel session was held between 1:45 pm and 2:55pm

Moderator:Mr. Sajid Anwar, WACA-World Bank

Presentation: 1:Mr. Senyo Adzah

Co-designing mangroves as nature-based solutions to coastal hazards in Eastern Ghana

The study sought to assess mangroves as nature-based solutions to coastal hazards in Eastern Ghana

He identified lack of data and stakeholder engagement, long period of mangrove maturity, inadequate funding, complex land tenure system, and resource use conflict as barriers to developing nature-based solutions. The study developed a co-designed approach called MANCOGA. The study recommends sufficient data and research in understanding local ecology, climate, ecosystem management, local engagement, sustainable and alternative livelihood, cultural and ethical concerns, and combination with nature-based solutions will protect the coast against hazards

Professor Prateep Nayak, University of Waterloo

Presentation: 2: Nanabanyin Kwame Okwentsie Ekumah

Modelling the morphodynamics of Fuveme beach within the Volta Delta, Ghana

Sandy beaches form 70 % of the world's coasts and are made of sediment less than 2 mm. These areas are changing due to climate changes and anthropogenic factors. The study was conducted at Fuveme Beach, an area close to the Volta Estuary. An unmanned Aerial Vehicle was used to take images of the beach which was used to assess sediment dynamics and MIKE 21 model was used to model sediment movement across the entire Fuveme Beach. The results showed shoreline changes, sediment variation and beach profiles for the area between October 2021 and October 2022. Sediment volume over the entire period was moderate but shoreline erosion was predominant over the study period. The total load modelled using MIKE 21 model was compared to Geomorphic Change Detection results. Sediment variation was evident over the period with significant changes shown between May and July 2022. These changes were attributed to the proximity of the study area to the Volta Estuary, Ada Sea defence, and occasional spillage from the Akosombo and Bagre Dams. The movement of sediment was predominantly offshore but alongshore sediment movement was from the west to east. The recommendation was for more work to be done to monitor Fuveme Beach and adjoining beaches in the Volta Delta

Presentation 3: Sulley Ibrahim

The impact of climate change on children's rights to food and health in marine smallscale fishery communities in the Volta Region of Ghana

The study seeks to assess the impact of climate change on nutrition and health on marine small-scale fishery communities in Keta and Ketu South coasts which are sandwiched between the sea and lagoon. The study employed qualitative research between 2022-2023 using Focused Group Discussion The study found that flood causes the following:

a. homelessness and effect on general well-being
b. disempowerment from national goals
c. affects health of children; cholera and diarrhoea outbreak d. loss of life
e. malnutrition and hunger

The study noted that the impact of climate change is mainly on food health and thus calls for policy direction in these areas. The moderator noted that all three presentations speak to the threat in Volta delta which suggests an area of urgent policy concern and closed the first part of the parallel session.

The second part of the parallel session took place between 3:00pm and 4:30pm

Presentation: 4 :Godwin Tutu Ofosu

Estimation of sediment flux along the coastline of Ghana

The study sought to compute sediment transport along the over 550 km coastline of Ghana. The objectives of the study were to compute the cross-shore and alongshore sediment flux along the entire coast of Ghana and also assess the wave conditions along the coastline.

The study utilised wave data from the Fifth generation of the European Centre for Medium-Range Weather Forecasts (ERA5) and the data provided comprised of daily hindcast data for offshore significant wave height (H_s), direction (θ)and peak period (T_p).

Validating ERA 5 interim data with wave buoy data is a crucial step in ensuring the reliability of the reanalysis dataset.The offshore wave conditions were converted to nearshore waves because the sediment flux was computed for the surf zone not offshore zone. To convert offshore waves to near-shore conditions, the WoeH model was used. The study found that wave heights are not solely responsible for sediment flux but other factors like sea level rise and tides also influence the transport of sediment. The sediment generated along each section of the coastline in Ghana ranged between 4.236 m^3 and 81088.82m^3. Peak sediment flux occurs in July concomitant to the highest wave heights; however, Accra recorded the lowest sediment fluxes.The study thus recommends further studies to be done to understand the varying sediment characteristics along the coastline of Ghana. Also, as the capacity of existing dams and reservoirs to trap sediment declines in the future, erosion rates along the

coastline of Ghana will increase hence emphasis should be placed on measures that can help reduce coastal erosion and coastal vulnerability along the coastline. These measures include beach nourishment practices, building sea defence systems like groynes, revetments, etc.

Presentation: 5: Emmanuel Klubi

Morphological responses of the nearshore bed to coastal defence structures: A case study of Elmina and Anomabo in Ghana

The relevance of hard engineering structures in managing coastal erosion in Ghana was highlighted by way of introduction. He stressed the use of bathymetry surveys to aid in the movement of sediment along beaches. The study assessed the response of nearshore wave breaking against sea defence structures and assessed the morphological deposition of sediment in coastal defence structures and the morphological deposition of sediment in coastal defence structures in Elmina and Anomabo. Bathymetry surveys were conducted at Elmina and Anomabo. A model was also used to account for seabed sediment depth evaluation. The results showed that the sea defence structures causd erosion due to sediment removal from the nearshore during swash. There was more sediment gain in Elmina as compared to Anomabo. Again, sediment loss was attributed to strong backwash moving sediment offshore. In his recommendation, he advocated for the defence wall (revetments) to be minimised to allow for a longer swash zone and allow for a gently sloping beach profile. He recommended that the study should be replicated elsewhere.

Sub - Theme 5 : Renewable and Non-Renewable Energy Resources

Professor Simon Mariwah, University of Cape Coa**st**

This session was an open forum which had 16 participants in attendance. The session was moderated by Professor Simon Mariwah

Topic for discussion was:"***Challenges and the way forward for African economies in the area of blue renewable energy resources***"

The session commenced with a self introduction of the participants which was coordinated by the moderator of the session Professor Simon Mariwah who also made an introduction of the topic of discussion.

Prof. Mariwah gave a preamble on the topic to be discussed with a clear-cut guideline as to the discussion pattern of the session in the following ways:

- general discussion on the challenges of harvesting blue economy-renewable energy (i.e tidal energy, wind, etc),
- the way forward when harvesting blue economy-renewable energy (i.e tidal energy, wind, Ocean waves, etc).

Some of the challenges identified were:

1. Renewable Energy (RE) Challenges:

- Infrastructure Costs: Establishing renewable energy infrastructure can be expensive, hindering its widespread adoption
- Resource Variability: The availability of renewable resources varies by location, necessitating regional solutions
- Inadequate technical know-how (knowledge gap on installation of RE technologies).

The Way Forward:

- Diversification: A balanced energy mix that combines renewables and nonrenewables can provide reliability and sustainability
- Technological Innovation: Investing in research and development for energy storage, grid management, and cleaner fossil fuel technologies is crucial
- Policy Support: Governments must provide incentives and regulations that promote renewable energy adoption and reduce emissions
- Stakeholders involvement in the renewable energyE sector especially local communities for the provision of alternative livelihoods for those potentially affected with the installation of RE technologies.

Speaking on the need to establish renewable energy technologies, Prof. Eghan argues whether the need for those energy technologies exists or not, as this will better position us as Africans for the ensuing challenges that lie in those technologies, citing the thoughts of Prof Rashid in the case of France banning short distance travels by air. Taking into consideration the economic status and the infrastructure of those countries transiting compared to the third world countries.

On the technologies available, the moderator Prof. Mariwah, lamented on both small and large technologies as prospects for the Africans highlighted the need for proper and thorough stakeholder analysis as well as the need for cost-benefit analysis before adopting any technology. He also mentioned ways of harnessing the ocean waves in the renewable energy sector/ resources. To harness ocean wave energy, specialised

devices such as wave energy converters are used to capture the kinetic energy of ocean waves. These devices convert wave motion into electricity and can be installed offshore. However, challenges include device reliability, maintenance, and environmental impact, which must be carefully managed.

Prof. Eghan cautioned the participants to know the benefits of renewable energy resources by listing some of them. Benefits of Renewable Energy

1. Reduced Carbon Emissions
2. Energy Security
3. Job Creation:

The impacts of renewable energy resources on the community were discussed by the participants.

Impact on Communities

Prof. Mariwah, contended that the impact of renewable energy on communities depended on various factors, including project scale, location, and community engagement. While it could bring economic benefits and reduce emissions, potential drawbacks include land use conflicts and displacement, which must be managed through careful planning and community involvement.

Madam Sika categorically deliberated on the need for an Environmental Impact Assessment (EIA) which would have addressed the issue of some environmental challenges that often arise in adopting RE technologies. She stated that the stakeholders are often not thoroughly consulted and she suggested the need for a proper EIA which will address some of the challenges as a result of human-induced activities.

Prof. Grant dilated on the importance of piloting technologies before mass implementation and the availability of alternative livelihood for the potential affected individuals to prevent further damages using the american philosophy of pragmatism of GGL (Greater good for the greater number) since the technologies are for the peoples lively sustainability.

Patrick Lumumba of Ghana Maritime Authority highlighted the importance of zoning which would definitely increase the yield for sustainability

Mr. Yamoah of the Fisheries alliances stated that, “necessity is the mother of invention. Once a technology is adopted, it needs to know its pros and cons leading to bettering it thus improving on it or the development of new technologies to address those challenges.

Prof. Mariwah stated that, people are generally afraid of change; Looking at the knowhow, and the benefits that lie therein, how do we plan to avoid those issues to ensure that we as Africans can benefit from blue renewable energy technologies?
Prof. Grant emphasizes the need for ethics as humans are not on top of the food chain. Putting ethics in consideration will lead to more social cooperative responsibility.

Mrs. Sika Abrokwah of ACECoR dilated on the need for more technical capacity building through deliberate attempts to train people on some of those energy technologies that are lacking therein Africa as some of those technologies may have work in other areas which may not necessarily work in this part of the world. In addition, Charles Smith of EJF supported the view of Madam Sika. He stated that, "African problems need African solutions", making reference for policy alignments since most of the car industries are moving into Africa which are manufacturing corban emitting vehicles.

For his part Joseph Yeboah of the Fisheries Commission, informed the meeting on the establishment of some MPAs in some coastal areas of Ghana in the central region.

Dr. Nunoo, spoke on how we could benefit from tech. He highlighted the need for more capacity building through training the needed human resources. As to who should be blamed? Dr. Nunoo further emphasised that the need for generating energy, needs serious training with the support of policymakers to be the way forward to better develop RE technologies and harness the vast unutilised benefits from the Blue space through evidence-based solutions with cutting-edge technological developments. He cited the partnership of the Department of Applied Economics with ACECoR as one in the right direction which needs more replication among other players in the Blue space. Without robust capacity development, we will achieve the desired goals of harnessing RE techs.
Discussion regarding renewable energy in Africa revealed that Africa possesses immense renewable energy potential, including solar, wind, and ocean energy. Investing in these resources can provide access to clean electricity, stimulate economic growth, and contribute to climate goals.
However, challenges such as financing, infrastructure, and local capacity must be addressed to unlock this potential. It was noted that sustainability and alternative livelihood are key when it comes to renewable energy resources because one has to make a trade-off in order to have a better life and collaboration between government and communities is one of the important factors in investing in renewable energy resources.
Journalist Kingsley of Ghana Broadcasting Corporation: Happy for the inclusion of the issue of BE in the VP plans.

Questions: (Q&As)

Q1. Hannah of Fisheries commision: How does one build RE technology?

Ans: The moderator answered that a bicycle with a dynamo lighting system is one of the simplest technologies for generating energy.

Q2. Charles Smith of EJF: Is technology really our enemy? Posing the advancement example in the fisheries sector as in the case of using onboard motors.

Ans: A thorough deliberation was made on to that effect as the participants highlighted the pros and cons of every technology that emerges.

Q.3 Vida Kwakye of EPA asked about the concept of sustainability considering the nature of technology citing examples on some of the banned chemicals which were once useful.

Ans: A general discussion was done to that effect in which most of the participants clarified the concept of sustainability as a means of continuity with new and advanced technology with the advent of time.

Recommendations:

- Holistic approach to the promotion and adoption renewable energy technologies
- Governments needs to invest in more resources (i.e. technology, human capacity building, research development, governance)
- Government needs to enhance coastal development planning through zoning or creating more MPAs for better understanding of all stakeholders on the adoption of RE facilities along the coast
- Carry out community engagement and benefits-sharing
- More investment by the government and its stakeholders to improves ocean wave energy technology
- Training policies for training and retention are all key factors in creating renewable energy.
- Support energy access in Africa

Sub- Theme: Sustainable Fisheries Resource Management in Ghana

This is a special session organised for fishers in Ghana with funding from the Ghana Fisheries Recovery Activity (GFRA) project. The session had about 100 participants focused on two topics namely: "Marine protected Area as a tool for fisheries management"

and "Ministerial Directives on the use of fishing gears: impacts on the individual fishing sector and fishing effort"

Key points from presentation:

(i) ***Summary for MPA as a tool for fisheries management:***

Marine protected areas are very important for fisheries management and conservation. It can protect depleted, threatened and endangered species populations in Ghana, there are very few marine protected areas for fisheries conservation though we don't have the legally designated ones hence, there should be education and sensitization in order to make fishermen aware of the importance of creating more MPAs in Ghana.

A section of women fisherfolks at the conference

(ii) ***Summary on the ministerial directives on the use of fishing gears: impacts on the individual fishing sector and fishing effort***

Industrial trawlers use fishing vessels that use a trawl, a conical net that snares fish. Industrial trawlers have so far been compliant because there are checks and balance

systems put in place. About 40 trawlers with license are currently working where they have all changed their nets as they were told to do so. In addition, there has been improvement in the by catch by industrial trawlers in Ghana.

Questions

Question 1 by the moderator from GFRA.

1. Do we have MPAs in Ghana?

Answer: There aren't MPAs in Ghana but there have been steps and initiatives to work towards establishing some of them.

2. Are fishers aware of what MPA is?

Answer: Enough education has gone down into sensitising the fishermen.

3. Are the industrial fishers aware that there are places they're not supposed to fish?

Answer: Yes, they know. They don't fish in the Exclusive Economic Zone (EEZ).

4. What can be done to conserve our fisheries aside MPA?

Answer: There should be alternative or supplementary livelihoods. There should be livelihood outside the fishery so that the main income is not coming from the fishery. Some of the communities are already doing well in the alternative livelihood program they are Discover and, Miamia. They are involved in rubber plantation.

5. Do you think MPA has an impact on artisanal fishers?

Answer: There are places which are reserved already so demarcating more will affect the SSfs in Ghana. We should not add more designated areas because this may affect the sector.

SUB-THEME: Marine Pollution and Management

This session is a parallel scientific session with five (5) oral presentations on the broad topic: Impact of pollution on coastal ecosystems and coastal communities. The session had 26 people in attendance and was moderated by Dr. Holly Nel (Ocean Country Partnership Programme(OCPP) and Mrs. Sika Abrokwah (Center for Coastal Management)

Below are the summaries of each presentation

Presentation 1: Dr. Charles Abimbola Faseyi

Assessment of environmental degradation in two coastal communities of Ghana using Driver Pressure State Impact Response (DPSIR) framework.

Human activities contribute greatly to the degradation of coastal ecosystems, especially concerning the occurrence of floods and coastal erosion. In collecting data, he employed focus group discussions and conducted pollutant analysis on water and sediment from the Ankobra and Pra estuaries in the Western Region of Ghana. From his work, it was realised that some drivers of the estuary pollution included mining, sand winning, and improper disposal of waste among others. With pressures including the reduction of ecosystem services and in effect livelihoods. From the toxic metal analysis also, he found both the Pra and Ankobra to be polluted with toxic metals such as lead, copper, arsenic and iron at values above safe levels as prescribed by the US EPA. In conclusion, he mentioned the lack of feedback from the relevant stakeholders even though suggestions had been made after conducting this research to put regulatory frameworks in place to manage these coastal ecosystems.

Presentation 2: Ms. Eunice Ofoli-Anum

Impacts of small - scale coastal construction on near-shore ecosystems along the Central Coast of Ghana.

This research was conducted in Elmina, Mumford and Biriwa, where Biriwa served as the control site with no small-scale construction taking place. The study aimed to evaluate the physico-chemical condition of nearshore ecosystems within the vicinity of selected fishing harbours under construction with global ecosystem health criteria. To obtain viable data, the research was conducted in areas that had the same rate or level of small-scale construction going on. Ms. Anum however did mention that during her research, the Elmina harbour (small-scale construction) was completely built, leaving behind that of Mumford, which has still not been constructed up until now. From her data collection, she conducted toxic metal analysis for both water and sediments as well as some water quality analysis, and the high levels of copper and phosphates are of great concern. All in all, the overall water quality for each of the study sites was very poor, and small-scale construction on nearshore ecosystems contributes to the pollution of such ecosystems. As recommendations, she suggested the use of environmentally friendly construction materials as well as best management practices and continuous monitoring during small-scale construction.

Presentation 3: Ms. Dorothy Lukhabi

An integrated water quality index for monitoring estuarine ecosystem health in Ghana.

Her work was based on the premise that standards do not exist in Ghana to monitor the water quality of estuaries, and this is worrying considering how important such ecosystems are. The objective of her study was thus to develop a water quality index to be used in the monitoring of contaminants in estuaries in Ghana. The research was conducted in four sites (Ankobra, Kakum, Volta River and Whin estuaries. Four major phases (Data collection, Laboratory analysis, Data analysis and the water quality index development. Results from the laboratory analysis show that Whin estuary which has generally been considered one of the pristine water bodies in Ghana is polluted. As a recommendation, she mentioned that there was a need to incorporate physicochemical parameters and benthic macroinvertebrates in the water quality analysis.

Presentation 4: Mr. Justice Yeboah

Potential impact of antifouling paint on marine copepods.

A background was given on how important copepods are to the aquatic food web and also mentioned the fact that the survival of fish is in one way or the other dependent on the survival of the copepods. For his work, he sought to investigate the potential impact of antifouling paints on copepods. To achieve the aim of his study, he created an environment with conditions similar to that of the marine ecosystem, treating the experimental set-up with commonly used antifouling paint. Despite the lack of a standard, to determine the environmentally friendly threshold of the biocides present in the antifouling paint, he employed a range finding test, based on values prescribed by the antifouling paint manufacturers to arrive at some standards. Results of this study showed that every per cent increase in the concentration of the antifouling paint led to an increase in the mortality of copepods. It was also found in the course of the study that even though the set-up for the experiment was polluted, the copepods laid even more eggs, only confirming literature that mentions increased egg production as a possible indicator of stress in copepods. In conclusion , he emphasised the need to adopt strategies for pollution control, to protect copepods and coastal ecosystems in general, for the sustenance of livelihoods.

Presentation 5: Ms. Rael Adhiambo

Impacts of climate change and pollution stressors on the diatom Thalassiosira weissflogii adapted to tropical estuarine conditions

During the presentation, Rael gave an overview of how aquatic ecosystems are currently under pressure from multiple stressors such as pollution and climate change. The objective of her study was thus to undertake an ecotoxicological assessment of the impacts of individual climate change and pollution stressors on the functional attributes of *Thalassiosira weissflogii*. The results of her research proved that changes in the individual parameters (pH, salinity, cadmium etc.) considered, had an impact on the species of focus. Interestingly though, the Thalassiosira weissflogii from

this study is generally considered as having the capacity to withstand such pressures. As recommendations, she suggests that the data obtained from the study be used to provide specific parameters for modelling the impacts of global change in coastal ecosystems.

To end this session, Dr Holly Nel allowed the presenters to share their thoughts on how Africa could develop the blue economy and what their biggest worries would be if we did not.

According to Ms Adhiambo, her greatest worry was that if researchers and professionals continued to work in isolation without interacting with individuals from other disciplines to find solutions to the challenges facing the blue economy, we were going to miss the mark.

From Ms Eunice Ofoli-Anum's point of view, the blue economy can only develop if marine pollution is tackled and greatly reduced. Mr Yeboah also stressed the fact that the only way we could continue benefiting from the ecosystem services provided by the blue economy was if pollution became a thing of the past, most especially plastic pollution. Finally, Ms Lukhabi, also recommended that policymakers focus on protecting and preserving estuaries as they are the nexus between marine and freshwater.

SUB- THEME: SOCIO-ECONOMICS AND COASTAL DEVELOPMENT

This parallel oral session was moderated by Prateep Nayak and Derek Armitage and had 19 participants. The various presentations are as follows:

Presenter 1 : Richard Adade

Coastal hazards mapping for an informed adaptation decision making in the rural communities of Ghana

The researcher shed light on trends of sea level rise in Ghana. Global reports on the decline of salt marshes and mangrove and how it affects livelihood was stated. In Ghana, the Government of Ghana over the years has sorted to find solutions to the impact of sea level rise. However the development takes place in bigger cities such as Takoradi, Axim leaving rural communities like Anlo beach. The government response to these rural communities is relocation, where these communities are unwilling to relocate due to some varying factors such as Psychological Trauma. Proper Adaptation measures to build coastal rural communities resilience to sea level rise

impact is very important and this can be achieved by detailed mapping to understand the local sea level rise as well as socio-economic system. The study aims to map the different impact of sea level rise scenarios in three rural communities.

Data set was derived from drone and satellite images, participatory mapping to understand the idea of how the beach is. Using SLAMM and RCPP scenario for data analysis, the result showed inundation and erosion areas. Among these three study communities, Glefe has a higher risk of inundation and erosion due to low lying area and high population density due to its proximity to the city. In conclusion, 47.9% of the coastal rural landscape is likely to be impacted. The findings of the study recommends that the adaptation measures should be tailored differently to these communities looking at what they have and what could be exposed and as a result the community resilience can be built.

Presenter 2: Prince Prah

Assessing the sustainability of wetland-based livelihoods in the Keta Lagoon complex Ramsar site (KLCRS) of south-eastern Ghana

The research sought to address the issues of livelihoods in the context of the Blue Economy. In the introduction, the research stated that In Ghana, the prospects of a Blue Economy are inuring and key areas include oil and gas exploration, salt mining, and coastal ecotourism. However, research has shown that indigenous coastal livelihoods are suffering. Literature including Ayilu et al (2022) notes that small-scale fishery in Ghana is worsening. This study was conducted within the wetlands of the Keta Lagoon Complex Ramsar Site (KLCRS). The researcher explained that the study was conducted there because of the overexploitation and other numerous anthropogenic pressures that have led to a decline in biodiversity, particularly fisheries in the area. The overarching goal of the study was to assess the wetlandbased livelihoods within KLCRS and the specific objectives included the following:

- To explore livelihood assets available to residents in selected communities of KLCRS
- To explore the context within which the identified livelihood options may be vulnerable
- To examine the institutional arrangements that influence livelihood options
- To determine the economic, social, and environmental outcomes of these livelihood options.

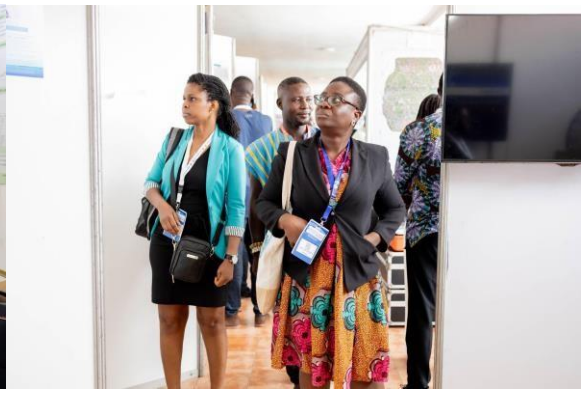
The results revealed that the lagoon served as the largest source of natural resource capital for the coastal inhabitants within the Ramsar Site. Also, approximately half the number of the respondents did not know any policy institutions. About 17% knew about policy institutions but hardly knew the various policy interventions. The results

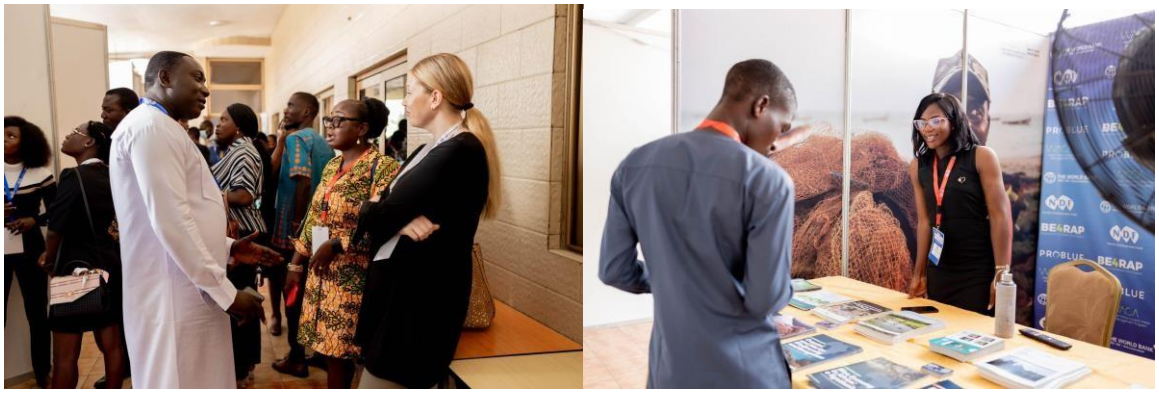
also talked about the vulnerability context and livelihood outcomes of the interviewed coastal inhabitants. Fishing was the predominant livelihood at the place.

The recommendations of the study included the implementation of non-wetlandbased alternative livelihood programmes to ease the pressure and over-reliance on the wetland resource and also further research needs to be conducted into the livelihoodrelated blue economy prospects of KLCRS. Presentor 3 : Dr.Precious Agbeko Dzorgbe Mattah

Implications of future rainfall variability simulated under selected shared socioeconomic pathways (SSPs), for the Keta Basin of Ghana

The researcher introduced the study by highlighting the characteristics of the changing climate which include: Increasing atmospheric temperature leading to warmer ocean waters, Sea level rise, Erratic rainfall, Longer periods of drought, Severe tropical storms, Increasing floods, Reduced number of wet days, Changes in the onset of rainfall, and Increasing threat to coastal areas/communities and ecosystems. Therefore, with these threats, a good understanding of climate and extreme weather variation characteristics on a temporal and spatial scale is key to adaptation and mitigative measures. The study was conducted in the Keta Basin which is under various threats, especially anthropogenic pressures including socio-economic threats. The study made use of datasets such as weather data. The results section revealed the future rainfall variability in the Keta Basin, thus between Ada and Akatsi. The discussion and recommendations included: severe implications for drainage, perennial flooding, biodiversity, and the general livelihood of the communities due to the dynamics in the rainfall pattern. Issues of siltation in the northern part of the Basin and the collapse of the double maxima rainfall regime into one starting from April to November each year means a prolonged rainy season which may affect both cropping and other economic activities of the area. Issues of choked water channels and drainage systems have been widely reported about the basin which calls for a proper drainage system.





Photos from the Exhibition and Poster Presentation Sessions

DAY 1 - AFTERNOON SESSION
SUB-THEME 1: SUSTAINABLE FISHERIES RESOURCE MANAGEMENT IN GHANA

This is a special panel discussion session moderated by GFRA with more than 100 individuals in attendance. The topics of discussion were

(i) Implications of capacity reduction strategies in the artisanal fishing sector: opportunities and challenges and

(ii) Implementation of supplementary livelihoods in the fisheries sector: opportunities and challenges

Key points from presentation:

(i) ***Summary of implications of capacity reduction strategies in the artisanal fishing sector: Opportunities and challenges***

We need to reduce our canoes to about 10,000 or less. If we don't do that, the Small Scale Fisheries (SSF) will decline further in the future. A lot of canoes promote overcapacity and too many pressures on our dwindling fish stock in Ghana. Also, more fishermen are moving from the fisheries sector because of the stock decline. In addition, fishing inputs such as Premix fuel is very expensive and this is pushing people away from the sector. Also, supplementary livelihoods are a key goal to reduce overcapacity and the number of fishermen.

(i) ***Summary of the implementation of supplementary livelihoods in the fisheries sector: Opportunities and challenges***

Supplementary livelihoods are very important because it promotes and improves the livelihoods of small-scale fishers in Ghana. Unfortunately, the supplementary livelihoods have not worked in a lot of fishing communities in Ghana. This is a great challenge we need to look at. One major challenge for the supplementary livelihood

program is that it is very difficult to recruit the men because they often give the excuse of having more than one wife so they need to work extra hard for their wives. As a result, they don't join the program. Out of the 300 people who have been recruited for the livelihood program, a lot of them wrote the exam and they will be awarded certificates if they pass

Recommendations from Panel Members

The stakeholders are doing their best to educate the young ladies but most of them are not interested, there should be more awareness created.

There should be a MPAs to conserve our fish stock.

There should be education and sensitization for fishermen in order to prevent illegal activities. The industrial trawlers should be regulated well to protect our SSFS

SUB-THEME 3: SOCIO-ECONOMICS AND COASTAL DEVELOPMENT

This parallel oral session was moderated by Prateep Nayak and Derek Armitage and had 17 participants. The various presentations are as follows:

Presenter 4: Naomi Elikem Sunu

Social capital factors and post-cyclone Idai food insecurity among households in Beira Mozambique

The researcher introduced the study by stating that physical, social, and economic access to sufficient, safe, and nutritious food is essential for the security of all populations, especially those vulnerable to extreme climate-related events. The researcher stated that extreme weather events such as Cyclone Ida and Cyclone Kenneth in Mozambique are key contributors to food insecurity. The research gap that the study sought to address is the less focus on the role of important community-level social adaptations for post-disaster food insecurity interventions. The study buttressed that social capital networks are crucial for climate change adaptations and post-disaster food access. The various types of social capital networks were highlighted. The study looked at the vulnerability of the population to food insecurity in Mozambique. The specific objectives of the study are:

To examine the differences in food access strategies among households in displaced and non-displaced communities based on bonding, bridging, and linking social capital networks post-cyclone Idai.
To examine the limitations in household food access based on bonding, bridging, and linking social capital networks post-cyclone Idai. Data was analysed through verbatim transcription and thematic content analysis.
The findings from the study included that non-displaced households mostly rely on neighbours (bonding) and community groups (bridging) social networks while displaced households relied on humanitarian institutions (linking) social networks for food access during post-cyclone Idai. Some limitations included that non-displaced households have reduced reciprocity, thus, increasing food access for receiving households and reduction for giving households. Displaced households with large sizes were mostly disadvantaged.
The researcher then concluded that bonding and bridging social network interactions were more relied on for facilitating food access among households rather than humanitarian linking social capital networks post-cyclone Idai.

Presenter 5 : Mattah M. Memuna

Community perceptions, knowledge, and coping mechanisms on perennial climate change-related disasters in the Volta estuary of Ghana, West Africa

The researcher introduced the study mentioning that although several studies have been carried out in the area of vulnerability status of coastal communities in Ghana, people continue to live along the banks of the estuary for various reasons such as livelihoods and cultural attachment. To ensure disaster risk reduction among these communities, there is a need for a systematic approach to risk identification and assessment to provide mitigation measures for the adverse effects of disasters. The overarching goal of the study is to assess local communities' perspectives of disaster risk in the study area. The specific objectives are to understand the perception and knowledge of disaster risk and identify their coping mechanisms.
Various results were obtained from the study. Focus group discussion and in-depth discussion were the ways through which data were obtained. Some of the community coping mechanisms include relocation, beach nourishment, and amongst others.
In conclusion, the study revealed that relocation is an adaptation strategy by the past and present generations as well as early warning signs. The study recommended that the government of Ghana and the District assemblies should assist communities in self-help DRR strategies to improve Disaster management in the study area.

Presenter 6 : Grace Emuobouvie Ayeta

Seasonal variations and health risk assessment of microbial contaminations of groundwater in selected coastal communities of Ghana

The researcher talked about how groundwater is a crucial resource on the earth. Several studies have reported faecal bacterial contamination of groundwater. However, few of these studies have focused on aquifers in coastal areas. The study aimed to investigate the seasonal variations in microbial contaminations of groundwater and associated health risks in four coastal communities. The specific objectives were to

1. assess the bacteriological quality of groundwater sources in the coastal communities of Ghana,
2. investigate the seasonal variations in microbial contamination, and assess the potential health risk associated with the use of groundwater.

Data analysis was done through hazard identification, exposure assessment, doseresponse assessment, and risk characterization.

Results showed seasonal variation in the E. Coli content between the wet and dry seasons due to the dilution effect in the wet season. Recommendations included: Public education on the importance of environmental sanitation, public education on the adverse effects of free-range, training of artisanal masons to construct wells that are befitting of set standards, major public wells (particularly community wells) should be fitted with rope pumps

Presenter 7 :Sèna Donalde Dolorès Marguerite Deguenon

Assessment and Spatialization of Vulnerability of Benin Coast to Sea Level Rise using Composite/Blended Approach (Gis, Rs and Socioeconomic Surveys)

The researcher started by mentioning sea level rise which is occurring in coastal communities, inundation, and saltwater intrusion which is causing adverse effects on coastal ecosystems, infrastructure, and human settlements. The study was conducted along the coastal communities in Benin. The study aimed to fill the research gap and provide valuable insights into the potential impacts of sea level rise on the coastal areas of Benin.

The study employed a combination of GIS and remote sensing techniques as well as socio-economic surveys offering a powerful and effective approach to assessing the vulnerability of coastal regions to sea level rise. The objectives included: assessing the physical vulnerability of the coast area, analysing socio-economic vulnerability, and spatializing coherence within physical and socio-economic vulnerabilities.

The researcher concluded by stating that vulnerabilities in coastal communities threaten livelihoods, infrastructure and public health emphasising the need for swift, tailored adaptation and mitigation

DAY TWO - 7TH NOVEMBER 2023

The opening and recap session of the previous day's activities (6th November2023) and overview of day's agenda, led by Ms. Ivy Akuoko began at exactly 9:00 am, where she expressed her gratitude to the keynote speakers, stakeholders and researchers, as well as everyone for their attendance.

After the opening session was the second keynote presentation for the Conference, moderated by Ms. Emefa Apawu but delivered by Dr. Patrick Karani from African Union Inter African Bureau for Animal Resources, on the topic: *The African Blue Economy Strategy: The Role of Technological Innovations, Investment, and Multilateral Cooperation in Achieving the Blue Economy We Want.*

Ms. Emefa Apawu

In the course of his presentation, he defined the blue economy from the world bank perspective and stated emphatically that on his part as a representative of the AU, the definition of blue-economy as stated by the World bank was biassed because it put emphasis only on the marine environment and its resources and not on that of the inland waters, which also played very key roles in the lives of Africans and the world at large. He also mentioned that Africa's dependency on the blue-economy for trade (eg. shipping) and its ecosystem services, meant that it had to have a very robust blueeconomy.

Subsequently, he stressed on the need for the blue economy to encompass all aspects of human needs (food, income etc.) and explained the need to have Marine Protected Areas (MPAs), as well as advanced technological innovation to assist in decision making processes, by being applied in areas such as the monitoring of vessels. He however, asserted the fact that, realising the blue economy required huge financial capital in the form of investment. According to Dr. Karani, the thematic areas of the blue-economy consisted of; fisheries and aquaculture, shipment, coastal and marine ecosystems, sustainable industries and robust institutions. From his viewpoint, ecotourism is the biggest contributor to the blue economy in job creation and in 2018, had the potential to create 49 million jobs, 27 million in 2030 and 78 million in 2063.

Some of the challenges he stressed on as affecting Africa's blue-economy were the lack of competencies and skills in the various sectors of the blue-economy. In order to achieve the blue-economy we want as Africa, there was the need to improve policy recommendations, enhance human capacity, create a knowledge hub for the blueeconomy, incorporate the blue-economy into the strategic plans of the various African countries, remove shipment barriers and modernise ports. He further stated, that the was great potential for the following sectors of Africa's Blue-Economy; mineral oil and gas, research and development (which as at now contributed to only about 0.1% of Africa's GDP, serving as the least explored aspect of Africa's blue economy, coastal tourism (hiking and fishing) as well as the blue carbon. In summary, Dr. Karani was optimistic of the fact that the blue-economy had great potential for Africa's growth and development.

Dr. Karani was asked by Ms. Emefa Apawu, if African countries were willing to incorporate blue-economy into its policies. In Dr. Karani's response, he stated that African countries were willing to incorporate the blue-economy into their policies.

Dr. Patrick Karani, AU-IBAR

Plenary Panel Discussion

Topic: The African Blue Economy Strategy: The Role of Technological Innovations, Investment, and Multilateral Cooperation in Achieving the Blue Economy We Want.

Members of the Panel;

- Mr. Peter Kristensen (Lead Environmental Specialist, World Bank)
- Prof. Wisdom Akpalu (Environment and Natural Resource, and Social Economics)
- Mr. Jacob Ainoo-Ansah (Ainoo-Ansah Farms Ltd)
- Prof. William Cheung (Fisheries, Ecology and Marine Sciences)

- Prof. Francis K. Nunoo (Fisheries Science and Coastal Management)

Members of the Panel

To begin the discussions, the moderator (Ms. Emefa Apawu) asked what the panel's thoughts were on their experience with the oceans and how Africa as a continent could achieve the Blue economy it wants.

Below are responses as given by members of the panel

Prof. Akpalu: He stated that, African countries like Ghana, overemphasised the fisheries sector, leading to the mismanagement of rivers and oceans, resorting in overfishing. Subsequently, he made it known that research had to be improved, in order for Africa to better understand the changes in its stocks, as we were losing about 1 billion dollars to overfishing.

Prof. William Cheung replied to the same question stating that, there needed to be an investment in people, in order to reduce the loss of information and also to properly understand the impact of climate change on the ocean and on activities dependent on the ocean such as the fisheries sector, in order to develop a climate resilient blue economy.

After this round of responses, Ms. Emefa Apau asked some more questions and received responses from each of the panellists.

Below are the questions (**Questions)** and responses (**Responses)** given.

<u>Question 2:</u> On the path towards the blue-economy we want, where are we?

Response from Prof. Francis Nunoo: According to him, we have made some progress as a continent, however we still have more work to do and in order to do more, there is the need to establish a baseline with the help of our knowledgeable human and resource and technology, to understand the interactions that exists between the various sectors of the blue-economy. Mapping our blue-economy space will also be of great help.

<u>Question 3:</u> What could be the issue preventing us from enjoying the full potential of the blue economy?

Response from Mr. Jacob Ainoo-Ansah: From his point of view there could be a myriad of reasons as to why as a continent, we are not enjoying the full potential of the blue-economy. Some of these reasons could be; gaps in negotiating skills, our inability to analyse issues from a long term perspective, lack of skills and inclusiveness.

<u>Question 4:</u> How do we get to where we want to be?

Response from Mr. Peter Kristensen: According to him, Africa has made progress, citing the work done by Ghana for instance, where many NGOs including Hen Mpoano, have been able to generate documents on how fishers could identify illegal fishing practices, especially since in the past, some issues were not spoken about. In addition, there is much more information available on the blue-economy of Ghana and even Africa as a whole now.

<u>Question 5:</u> How are we harnessing Information Technology for Africa's blue economy?

Response from Prof. William Cheung: By enhancing the capacity of people and leveraging on technology for the development of a sustainable blue economy.

<u>Question 6:</u> How do we bridge the technological gaps?

Response from Prof. Francis K. Nunoo: According to Prof. Nunoo, we are doing well, however there is more to be done and by employing remote sensing technologies, developing new products and processing chains, we will be bridging the gap.

<u>Question 7:</u> How do we improve on the lack of technological skills and are the indigenous people afraid of technology and its impact?

Response from Mr. Jacob Ainoo-Ansah: According to Mr. Ainoo-Ansah, the fishers who form a large percentage of the indigenous groups directly related to the blueeconomy space, are not scared of technology, in fact they use some form of technology in their activities recently, for instance the use of their smart phones in following weather forecasts. In view of this, institutions must tap into this interest of

the local folk (fishers) in technology, developing software that would be user friendly. In all there is the need to take into consideration and also involve the indigenous people **Mr. Peter Kristensen** also responded to the same question. In his response, he shared his experience at an observatory in Kenya as well as with the impact being made at WACA, and mentioned the need to have a blue economy observatory in Africa, because the technological tools needed are already in existence.

Question 8: Where are we as a nation when considering technological innovations?

Response from Prof. Akpalu: According to Prof. Akpalu, even though we have made progress, there is still some way to go. He also stated that, any resource that is to be used, needed to have its state checked, and assessed. In addition, by introducing canoe registration systems, Ghana for instance, could save a huge amount of money, which it currently loses to the hoarding of premix fuel.

Question 9: How does politics affect policy?

Response from Mr. Ainoo-Ansah: There is the need for Africa to build strong institutions, in order that the focus on the blue economy can be maintained.

Response from Prof. Francis K. Nunoo: In responding, he added to what had already been said by Mr. Ainoo-Ansah, mentioning that, Kenya and Tanzania had created Blue-Economy institutions, and emphasized the efforts made by Ghana's government, in setting up a committee to work on strategic blue economy policies, adding the need to tap into the already draw strategy from the AU.

Question 10: Is policy direction needed to get to where we want in Ghana?

Response from Mr. Peter Kristensen: According to him, policy direction is needed to get Ghana where it wants to go in the context of the blue economy. In addition, he stated that, Ghana has seen some improvements as it considers a pro-blue marine spatial planning initiative. He was also of the view that, there needed to be a framework for Ghana's blue economy and the youth needed to be brought on board.

Question 11: Is it expensive to tap into the blue economy?

Response from Dr. Akpalu: Every venture is expensive and demanding, but in every situation there is the need to compare the costs and benefits. He also added that the

current Ghanaian administration, had made great efforts with regard to the fisheries sector and that one of the surest ways of preserving our ocean resources is by having good policies.

At the end of the discussion, the floor was opened for the audience to also ask some questions. Below are the questions they asked and the subsequent responses given;

Questions

1. Has Ghana achieved anything great with the existing technologies, innovation and investment?

(question asked by Nana Nkahomako IV of Shama (Queen mother of Shama))

Response by Dr. Akpalu: According to him, yes we have and the impact of his research on Vehicle Monitoring Systems(VMS) was a typical example, contributing to the fight against "saiko". In addition, he mentioned that, fishermen are more conscious on the issues in the fisheries sectors and how the various interventions are helping to promote it. He also added that no government can change the automation and VMS systems

Response from Prof. Nunoo: On technology and investment we have achieved great things, looking at the automated premix fuel systems in place now for instance.

Mr. Peter also added that on innovation, marine spatial planning had been enhanced in Africa and blue carbon was also being developed and ready to be operationalized. He also mentioned the need for inclusion in Africa's blue economy.

Recommendations by Audience

- According to Mr. Obinna, there has been emphasis on capacity building, and as such the ACE impact project must be supported to develop curriculum on the blue economy. In addition, Policy Frameworks for Fisheries and Coastal Resources in Africa must be developed, reviewed and updated. There must also be public education especially in the media for advocacy and awareness.
- The need to build technology and not just be users.
- More discussions should centre around the particular sector blue economy was to be placed.

Finally, to end the session was a video documentary on plastic pollution in Senegal and the Gambia by Mel D. Cole, a Photo Journalist. The documentary included the

menace of plastics and what must be done to reduce it. He also mentioned the efforts of WACA in addressing this challenge.

Mel D. Cole, a Photo Journalist making a presentation

PARALLEL SESSIONS

A number of parallel sessions were held. This plenary session began at around noon (GMT) and was moderated by Dr. Patrick Karani of the African Union-InterAfrican Bureau for Animal Resources(AU-IBAR) with 19 participants in attendance. In the course of the session, there were several presentations and below are the reports of the presentations given;Presenter 1 : Ms. Elizabeth Agyekumwaa

Exploitation of cetaceans and their socio-economic drivers: A case study of Ghana

During her presentation, she emphasized the importance of cetaceans to the ocean ecosystem and the challenges that they face. She later explained that several socioeconomic factors drive the exploitation of cetaceans in Ghana and that these factors included low fish catches, high cost of premix fuel, high price of shark fins, and market demand for carcasses.

From her findings, she suggested that promoting public education on the importance and the laws protecting cetaceans, introducing community-based dolphin ecotourism, establishing regional and national data collection on cetacean landings, and empowering the fisheries commission are some of the ways cetaceans could be conserved in Ghana. \

Presenter 2: Ms. Sheila N.A. Ashong

Reviewing the environmental assessment process, production trends, and opportunities for coastal aquaculture development in Ghana.

In her presentation, she discussed the sustainable development of aquaculture in Ghana. She highlighted the negative impact of aquaculture in Ghana so far, including poor water disposal and outbreaks of fish diseases that affect human health. Despite the record of several aquaculture setups on Ghanaian waterbodies, the majority of such ventures employed cage culture, especially on the Volta Lake.

She emphasized the need for aquaculture to be developed in all districts other than those surrounding the Volta River. Additionally, she mentioned that mariculture and research on water quality and climate parameters were some of the opportunities for the advancement of aquaculture in Ghana.

Presenter 3: Mr. Eric Appiah Krampah

Evaluation of local microalgal isolates as feed for hatchery production of West African Mangrove Oyster.

To begin his presentation, he stated the importance of oysters to Ghana as a country and the need for more research to be conducted on such shellfish instead of focusing only on the finfish as has been the case for a very long time. From his study, he observed differences in the survival rate of oysters treated and those untreated with the microalgal isolates.

Presenter 4: Dr Edna E.K. Quansah

Efforts to rid Ghana's seas of abandoned and discarded fishing nets: A transformational agenda to convert waste nets to useful products

As a part of her presentation, she highlighted that the use of monofilament nets in fishing leads to ghost fishing and shared that Thailand was the first country to pilot reducing the use of such nets by repurposing them as soap boxes.

Dr Quansah and her team collected and cleaned used monofilament nets purchased from fishers, transported them to storage sites, shredded them into granules, and shipped them off for recycling. She mentioned that each kilogram of nets was purchased at three (3) cedis, and a total of 4.9 tonnes of such nets have been collected and recycled into sun shades. Additionally, they produced documentary materials in the communities to raise awareness. However, Dr Quansah mentioned that one of the major challenges facing this initiative was the lack of a local partner to recycle the collected nets. Furthermore, they faced challenges in transporting the shredder and finding local technologists to repair it when it went faulty.

Sub-Theme: Sustainable Fisheries Resource Management in Ghana (Scientific Session)

- This scientific session was moderated by Dr. Isaac Okyere (Centre for Coastal Management/Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana) andDr. Evans Arizi (Centre for Coastal Management/Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana). The session had 12 participants including presenters.

Presentation 1 **:**Vinolia Pawar

Assessment of premix fuel governance and the relationship between premix fuel supply and fish catch in the small-scale marine fisheries sector in Ghana.

Vinolia emphasised the global significance of the small-scale fishery sector, particularly in terms of livelihoods and nutrition. She highlighted that 90% of people employed in the capture fisheries value chain are engaged in small-scale fisheries, contributing to 40% of global fisheries production, with Ghana's fisheries sector making up about 4.5% of the country's GDP. Despite the sector's numerous benefits, it faces various crises, including challenges related to premix fuel distribution, weak enforcement, over-capacity of canoes, and marine plastic pollution, all of which have adverse effects on the livelihoods of fisherfolk.

Vinolia's presentation primarily focused on the challenges associated with premix fuel distribution. Premix fuel is a hybrid oil and gasoline used for outboard motorised canoes in Ghana's small-scale fishery sector, introduced in 1994 to alleviate the economic burdens on vulnerable fishermen. However, its distribution has been plagued by issues of politicisation, smuggling, and hoarding.

The study revealed that politicisation poses a major governance challenge in the distribution of premix fuel, although personal aids have helped address this issue, as reported by most respondents. Furthermore, the research did not find a significant relationship between premix supply and fish landings, nor between the quantity of premix supply and the number of canoes.

In conclusion, economically vulnerable fishers are disproportionately affected by politicisation and unequal distribution of premix fuel. The study also indicated that government-provided premix fuel does not necessarily lead to higher fish landings for small-scale fishermen. Despite declining fish stocks and lower catches, many fishermen continue their trade due to premix fuel subsidisation.
Vinolia's recommendations include a gradual reduction in the supply of premix fuel to avoid jeopardising the livelihoods of economically vulnerable fishermen. Funds should be reallocated to other social interventions, such as supporting supplementary livelihoods, providing education opportunities for youth in coastal communities, and offering insurance options for ageing fishers.

Presentation 2 **:** Lauren Josephs

Piloting of a sustainable, community-based methodology for oyster landings data collection.

Lauren's presentation primarily focused on shell fisheries, with specific reference to oysters due to a pilot project. The main objectives of the methodology were to gather essential information to understand the status of oyster fisheries and make informed decisions regarding their management. Additionally, the research aimed to determine which shellfish data collection system could be sustained without external assistance. The overarching goal was to enhance evidence-based knowledge about the biodiversity and socioeconomic value of a more integrated, rights-based co-management approach to shellfish ecosystems in the mangrove landscapes of Ghana and the Gambia.

In the first phase (2021 to 2023), Lauren's team developed a data collection system for shellfish landings that employed a "no regret" approach. This system involved using catch per unit effort as a basic metric to understand oyster fisheries data. It was designed to be maintained by harvesters, with data analysis conducted in collaboration with government and academia. The methodology used for data collection was simple, routine, and valued by the community. It included daily recording of catch and effort levels from all harvesters, as well as social mobilisation activities such as calibration, monthly market surveys, and daily catch and effort assessments. Initial findings indicated a significant decline in oyster stocks in the Gambia compared to the Densu in Ghana.

Challenges and Lessons Learned:

1. The introduction of a single universal container was rejected, suggesting the need for flexibility in data collection approaches.
2. Harvesting and processing often occurred on different days and in batches, making it challenging to match data with actual harvests.
3. Simultaneous landings by harvesters could overwhelm data collectors, requiring better coordination.
4. Finding available, literate harvesters and time for training presented challenges, as data collectors were typically paid staff members.
5. Some risks were perceived, and potential benefits were not immediately clear, indicating the need for better communication and education.

Sub-theme 2: Coastal processes, infrastructure, and sediments dynamics

Morning Session

The session was facilitated by Michelle Diez (PROBLUE Manager, World Bank). Fifteen people participated in this session.

Summary of Proceedings:

Presentation 1: Bernard Assiam

Land-Use and Land Cover change analyses to reveal recent (2002 – 2022) degradation of mangrove forests along the coast of Ghana, West Africa.

Highlighted the importance of the mangrove ecosystem in coastal areas. The study was carried out in three communities; Amanzule, Kakum and Volta Coastal Areas. The study was to assess the coverage of mangrove degradation along the selected communities between 2002 – 2022. LandSat images were obtained online and processed to clean the data for use. Land Use Land Cover Change method was used in the study. In the results, mangrove cover decreased significantly at Amanzule and Kakum but increased in the Volta areas. The transition analysis also showed that mangrove forests were targeted for conversion into built-up areas. He attributed the decrease in mangrove forests to current urbanisation in coastal communities and stressed that it is a major threat to mangrove ecosystems in Ghana.

Presentation 2**:** Kennedy Muthee

Mapping mangrove vegetation for biodiversity restoration and conservation in Ghana and the Gambia.

The goal of the study was to support mangrove development in Ghana and Gambia. He explained that the mangroves in Ghana were depleting at a faster rate as compared to the mangroves in the Gambia. In conclusion, mangrove mapping was sustainable for fisheries, estuarine management, conservation and management. Some questions were asked by participants and they were duly answered.

In the end, the moderator encouraged an integrated approach towards tackling mangrove degradation and stressed the need for collaboration among presenters and others to tackle mangrove-related issues since it is an ecosystem of global concern.

Ocean Governance and Marine Protected Areas

The session was moderated by Stephen Jay of University of Liverpool with 9 people participating.

Presenter 1: Rebecca Kyerewa Essamuah (PhD)

A decision support for coastal lagoon management in ghana, west africa

The presenter noted that the Fosu lagoon was characterised as a eutrophic system. Moreover, sediment quality was largely characterised by finer grains with low porosities, and high organic matter content which reflected in interstitial ammonia concentrations. Furthermore, contaminant holding capacity was inferred as high, requiring management of runoff into the Fosu lagoon.

The presenter also mentioned that stunted growth sizes of the dominant blackchin tilapia persisted with the modal class having a standard length of 8cm.

She then added the following:

- Thirty-three, largely resident, avifauna species were encountered. The piscivorous African darter was the most common bird. Most of the birds fell within the 'Least Concern' category of the IUCN list. Noise levels and human presence significantly affected the abundance and activities of birds encountered.
- Bacteria loads exceeded EPA recommended levels for fishing and bathing. Also, other land use practices within the catchment led to high plastics among flotsam sorted particularly after seasonal celebrations.
- Watershed delineation showed communities whose activities affected the lagoon. Major point sources of pollution/runoff were identified. Vegetated buffers were needful as a management strategy

- LMC-DSS was successful in defining the ecological state of the Fosu lagoon. Scenario creations proved the usefulness of the tool in decision-making with focus on prioritising management options.
- Legal and Environmental Policy review indicated responsible lead organisation(s) for issues within Ghana's coastal zone. A Social Network Analysis hinted of uncoordinated sectoral efforts in coastal zone management) Presenter 2: Sian Davies-Vollum, Resilient Lagoon Network

A Management Framework for the Sustainability of Lagoons in West Africa

Presenter emphasised the importance of stakeholder involvement and the diversity of stakeholders, she also mentioned that anthropogenic effects are more severe, diverse and complex than anticipated. In addition she noted that the impacts of climate change compounds anthropogenic impacts. However, there is a global connection with lagoons worldwide facing similar problems.

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Presenter 3: David Asumda

Institutional and Regulatory Gaps, Challenges and Future Prospects

Presenter highlighted that Ghana has the necessary laws and institutions to monitor, control, and survey fishing operations within Ghana's waters, and enforce fisheries law and regulations.

However, to ensure sustainable fisheries management in Ghana, the system of prosecution of offenders of fisheries laws needs to be strengthened; fishing communities and Fishers' organisations should feel part of the decision-making process to create a climate of cooperation and compliance; funds allocated to MoFAD and FC should be increased and there should be less political interference in implementation and enforcement of fisheries law.

Sub- Theme: Socio-Economics and Coastal Development

Morning Session

The session was facilitated by Derek Armitage, Prateep Nayak, Ella-Kari Muhl with 20 people in attendance.

Presentation 8: Abdul-Wakeel Karakara Alhassan

Social resilience and demographic characteristics of coastal communities in Ghana: Implications for the blue economy

The presentation highlighted the enormous support the ocean offers to support human life and the principles of the blue economy which should be focused on fishermen and other fishing communities. There is a need for research to be done considering social resilience in coastal communities to assess the impact that marine policies will have on marine communities. The study focused on implementing prospective policies and how these policies affect the livelihood of coastal communities. The objectives of the study included: examining the state of social resilience and the factors conducive to building social resilience in coastal communities and its implications for the blue economy and assessing the link between social resilience and demographic characteristics of coastal communities in Ghana. Hence, social resilience for the coastal communities can be explained by their perception of risk, ability to cope with change, and the interest level of individuals. At the end of the study, 80% of community members had fishing as their main occupation. The result from the PCA analysis indicates that the social resilience of fishermen along the coast of Ghana can be described by four broad attributes;

- The perception of risk emanating from change
- The ability to plan, learn, and reorganise
- Perception of the ability to cope with change
- The level of interest in prospective change

Also, the factors that greatly influence the resilience of fishermen include their level of education, social capital (belonging to a fishermen group), alternative source of income, and their fishing experience.

Presentation 9: Derek Armitage, Prateep Nayak, Ella-Kari Muhl

From Vulnerability to Viability: Navigating transitions and pathways in small-scale fisheries.

There are different ways to look at vulnerability: capital resources, well-being, etc. There are also many ways to understand vulnerability and viability. Struggles, response techniques, and others are ways we can follow to achieve viability. Hence, building resilience is a way of dealing with vulnerability (Reduced resilience leads to increased vulnerability). The research objectives of the study included: critically examining the diverse factors and conditions contributing to the vulnerability of

small-scale fisheries (SSF) and identifying and examining pathways and transitions to enhance the viability of small-scale fisheries.

It is important to involve small-scale fisheries (SSF) in our studies because they are mostly excluded in decision-making processes. Small-scale fisheries contribute critically to society, economy, culture, and environmental stewardship. SSF communities remain economically and politically marginalised, as a result, making them highly vulnerable to change. The involvement of these SSF communities in Blue Economy will help navigate them from vulnerability to transition.

Presenter 10: Aliou Sall

Migrating between vulnerability and viability: Iterative movements intrinsic to the internal dynamics of SSF under drivers of many orders.

To migrate from vulnerability to viability, the characteristics of the locations and settlements should be well studied. There are no alternative ways to make a living if community members do not engage in SSF. SSF serves as the pathway for selfactualization. Also, migrating from vulnerability to viability depends on a certain temporal and spatial singularity. The methods employed included both qualitative and quantitative approaches, thus, scientific literature, technical support from NGOs, Fisheries regional bodies and focus group discussion, and Geospatial mapping. Hence, there are iterative movements on the part of fishermen between vulnerability and viability.

Presenter 11: Clément Sambou

Vulnerability factors of fishing communities to climate change and response strategies in the Commune of Dionewar, Saloum Delta.

The study was conducted in an Island zone located in the Department of Foundiogne. Arrondissement of Nodior. It is composed of three villages: Niodior, Dionewar, and Falia. The consequence of recent climatic changes includes the reduction in the weight and size of fish landed, the disappearance of some species of fish, the migration of some species of fish and seafood, the poor quality of drinking water (salty), the high migration of the active population (women and children), the gradual disappearance of the mangroves. The methodology approach employed by the study involves the

integration of the environmental, economic, social, and governance aspects of smallscale fisheries, thus, literature reviews, field observations, focus group discussion, and GIS data and surveys of fishermen and women.
The study concluded by structuring the reflection around indicators for analysing the transition towards viability, a transition to sustainability for policies and practices, and a transformation of the structure and functioning of fisheries and ecosystems.

Presenter 12: Vannessa Warren

Small-Scale Fisher Transitions in Response to Climate Variability: Case of Lake Chilwa Malawi

The presenter started by giving a background to the study, Lake Chilwa. The objective of the study is to review the contribution of ecological status and governance towards the resilience of the fishery considering the high variability of the lake. The study employed the ADAPT framework, geospatial mapping, desktop review, key informants, focus group discussions, and participant observation as the methods. The study highlighted the link between water level changes and climate variability. Changes in water levels, floods, and drought have become more common phenomena in the Lake Chilwa basin. Water levels have been recorded but only for specific periods. There is mostly a decrease in food security during dry-outs, loss of income for fishers, and also destruction of areas where people farm. Also, violent cyclones have destroyed since 2019 with the recent one being the most devastating known as Freddy, which occurred between March 2-14, 2023. Climate variability has now become key to the vulnerability to viability process. The presenter ended by highlighting the insights on the V2V transition pathways. All these factors emphasise how vulnerable the ecosystem is and know how to plan around these changes. There is limited capacity in assessing vulnerability.

Presenter 13: Kafayat Fakoya

Examination of Seaweed from Vulnerability to Viability in Nigeria

The presenter started by giving an overview of the Badagry Coastal and Creek Fisheries. Invasive aquatic weeds present "wicked problems" in riverine and coastal communities in Nigeria and the Gulf of Guinea. Sargassum is transboundary and vulnerable to most coastal communities such that fishing activities are reduced whenever sargassum is in abundance. The research objectives included: identifying existing gaps in research to understand the management of seaweeds, determining existing and/or potential adaptation and

mitigation measures in fishing communities, identifying relevant state actors, and determining existing gaps in policy, governance, legislation, and management strategies of seaweeds, and identify private sector initiatives in management and utilisation of seaweeds. The study presented results on how sargassum and seaweed (water hyacinth) have been used to manufacture other things such as concrete blocks, briquettes, feed sources, dinnerware, and earrings made from water hyacinth. Preliminary insights suggest a holistic approach requiring synergy among state actors and non-state actors(Fishers and fishing communities, academia, research, and NGOs). There is a need to transition from biophysical vulnerability to natural capital towards enhancing the viability of fishing communities as well as providing enabling policies for co-governance, improved research, and value chain approach on seaweeds.

Presenter14: Julius Francis

Is Blue economy development an opportunity for reducing vulnerabilities of smallscale fishers in Tanzania?

Commitment by URT to increase marine areas under effective conservation and management. Commitment by URT to blue economy development and national marine spatial planning(MSP). The mainland of Tanzania constitutes 3 marine protected areas, 5 marine reserves(including 15 island reserves), and 5 marine conservation Areas in Zanzibar. There are two different resources in Tanzania; the main resource is the Finfish and the temporary resource is the octopus. There is deterioration of the marine environment due to competing interests and uses. The overarching objective of the study is to examine the implications on the livelihoods of coastal communities from temporary and permanent closures under two jurisdictions. The specific objectives were: to assess the impact of protected areas (temporary/permanent) on coastal livelihoods (planning, implementation, modalities, zoning, enforcement, compliance) in addressing vulnerabilities, to investigate how communities are coping with closures (alternative livelihoods), to examine how communities integrate systems as a mechanism for stock replenishment (community perceptions on success of closure), and to examine the implication of protected systems on gender equality. Methods employed include; historical analysis, trend analysis, photovoice, and interviews. The final points concluded by stating that understanding the cycle, thus, the process of implementation of temporary or permanent marine closures, comparing the implications between the two systems, and transforming octopus closures to fisheries.

Presentation 15: Mafaniso Hara

Role of Fishing Rights, Legal Recognition, and the political economy in the Transition from Vulnerability to Viability for Small-Scale Fisheries in South Africa

The researcher started by emphasising the fact that there were no officially recognized and legislated for small-scale fisheries until policy and legislation were passed between 2012 and 2014 legally recognizing the marine small-scale fishing sector. Policy recognizing inland SSF was only passed in 2021. The study was conducted in two study areas: Buffelsjagsbaal (marine) and Jozini (inland). The study had separate research objectives for the two different study areas. For Buffelsjagsbaal (marine), the objectives included: to what extent can the informal trade and markets for abalone be formalised, what are the roles of women in abalone fisheries and how can these roles be beneficiary improved, are their other livelihoods and economic opportunities on land and/or sea for the Buffelsjagsbaal community, and what are the pathways to viability in the context of climate change, food insecurity, etc. For Jozini, how can civil society, the recreational sector, and researchers collaborate with the government on pathways to implementation of inclusive policy, and what data and information (social, economic, and biological) is required for evidence-based change?

Presenter 16: Vinolia Pitris Pawar

Transitioning from Vulnerability to Viability: The Position Of Fisher Folk on the Abolishment of Premix Fuel Subsidies in Ghana

Nationally, there is a decline in fishing activities. Emphasis was placed on communities that rely on small-scale fisheries. The research focused on establishing the relationship between expenses made on premix and income derived from fishing, ascertaining the perception of fishers on the contributions of premix fuel to their income generation, and determining the position of fishers on the removal of premix fuel subsidies in Ghana. At the end of the presentation, the research concluded that expenses made on premix fuel do not always influence fish-related income. Also, about 90% of fishers perceive that premix fuel supports their income generation while the other 10% did not agree on the importance of premix fuel in their fishing activities.

The study recommends a sequential reduction in the supply of premix fuel in order not to jeopardise the livelihoods of the economically vulnerable fishermen.

Funds should be re-channeled into other social interventions such as supplementary livelihoods, education of the youth in the coastal areas, and insurance for fishers in their old age.

Beneficial subsidies like observation of fisheries resource programs should be established in order to restore our dwindling fish stocks.

Thematic Area: Emerging Blue Economies

This is a panel discussion on the topic "*The "low hanging fruit" to achieving sustainable blue economy in Africa"* with 21 persons in attendance. The session was moderated by Dr. Patrick Karani (*AU-IBAR)*

Panel Members:

- Dr. Sloans Chimatiro (Representative of AU-IBAR)
- Dr. Godwin Vondolia, Department of Applied Economics, University of Cape Coast, Ghana
- Dr. Jacob Nunoo, Department of Applied Economics, University of Cape Coast, Ghana
- Prof. Joseph Aggrey-Fynn, Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana

To begin the discussion, each of the panel members was asked to introduce themselves and make known to the individuals present what their expertise was in line with the blue economy agenda. After the introduction, the moderator; Dr. Patrick Karani, zoomed into the discussion by asking the members of the panel some questions.

Below are the questions and responses as given by the panellists;

Question 1: About research, what could be considered as the low-hanging fruit in achieving Africa's blue economy and what should Africa be teaching in its academic institutions to enhance its blue economy?

Response: Prof. Joseph Aggrey-Fynn mentioned that the rise of the concept of a blue economy has led to Africa realising the existence of many resources not only in the marine space but also in inland waters. As such, just as exists in the University of Cape Coast, where many undergraduate and postgraduate programs such as Fisheries Science, Intercostal zone management, Aquaculture, and the like, more of such programs relating to the blue economy must be taught all over Africa. In addition, more research must be conducted to tap into the many coastal resources available in Africa. To buttress the already mentioned point, he stated that until very recently even though Ghana was aware it had oil, this resource had not been tapped and up to date, there exists many species of fish that have not yet been identified.

According to Dr Jacob Nunoo on this same issue, there is a need to enhance human capital by promoting capacity building at the local level, through training programs

for the youth of our continent. He also mentioned that there was the need for Africans who have the technical know-how to be allowed to work in the blue economy space, instead of always relying on foreign personnel.

Question 2: From the economics point of view, what tools could be used to harness the potential of Africa's blue economy?

In response to this question, Dr Vondolia mentioned that in harnessing our blue economy as Africans, we could not isolate each resource, instead all the blue resources in question had to be jointly managed to explore their full potential. For instance, to properly manage mangrove forests and fish stocks, there was the need to consider the cost and benefit of each resource, appreciating their interconnectedness to optimise their net benefit functions.

Question 3: From a policy point of view what can be done to enhance the blue economy in Africa?

Dr. Sloans Chimatiro responded to this question, where he mentioned the need to capitalise on the linkage that exists between the rivers and the oceans. In his opinion, linking rivers to oceans could go a long way in supporting the transportation sector of African countries. In addition, the blue economy as we know it encompasses many sectors that are managed by different ministries, hence if Africa seeks to enhance its blue economy, then there is the need for cooperation among such institutions.

Question 4: This question was asked by Dr. Holly Nel, a member of the audience. She asked if fighting marine pollution could serve as a low-hanging fruit for Africa's blue economy.

Response: According to Dr. Jacob Nunoo, Marine litter is a huge problem affecting the blue space. To tackle this issue, there is a need for more public education and sensitization in our academic institutions as Africans, to encourage attitudinal change.

Question 5: How do we engage students on pollution literacy, so that they become agents of change?

Response: Dr. Nunoo in response to this question, further stressed the need to have more education on marine pollution in our basic schools, considering that these children are the future of Africa and that they have the potential to influence the behaviours of their parents and guardians subtly.

Still, on the issue of marine pollution, Prof. Joseph Aggrey-Fynn added that there was a need to create job opportunities in the marine litter sector, finding opportunities out of our predicaments. In addition, he mentioned that African countries including

Ghana, needed to take advantage of ecotourism; dolphin watching, coral diving and even designating Latitude 0 as the centre of the earth.

According to Dr Sloans Chimatiro, the only way we could fight this menace is by ensuring that the ocean is the centre for national planning. He also mentioned that tourism was low because of pollution.

Dr Godwin Vondolia was also of the view that to fully benefit from the blue economy, there was a need for technological transfer and more financial investment in that area.

Question 6: How does Africa, as a continent, tackle the issues of international engagement, by employing global instruments and how as a continent, do we get everybody involved in the blue economy agenda?

Response: According to Dr Sloan Chimatiro, there exist many global instruments to support Africans, however, the fragmentation in Africa prevents the continent from enhancing the full potential of its blue economy.

Dr Obinna from the audience also added that the AU-IBR had conducted a study on fisheries and aquaculture on a regional basis and made recommendations which were useful for best practices in Fish Stock 1 and 2. The Africa Centre of Excellence in Coastal Resilience(ACECoR), has also conducted studies to identify priority instruments for Ghana and make suggestions for effective documentation of such instruments. With all of this and even more available, Africans needed to be encouraged to take advantage of global instruments.

Question 7: Can valuation serve as an economic tool, and can all blue resources be monetized?

Response: According to Dr Godwin Vondolia, it is important to value coastal resources; placing monetary value on those that can be valued, as well as on non-use resources.

Question 8: There exists several strategies and frameworks for improving resource use. Also, there are existing platforms to help in advocacy and training, how do we make resources easily available to practitioners in the blue economy space?

Response: Dr. Jacob Nunoo asserted the availability of such resources, but mentioned that one of the greatest challenges affecting the ability to make such resources available to practitioners was the lack of funding. He made it clear that lack of funding limited the building of human capacity.

Question 9: Is it expensive to venture into the blue economy?

In response to this question, Dr. Sloans Chimatiro made it clear that no venture was cheap or inexpensive, however by taking into consideration the benefits that could be derived for Africa through this blue economy, there was indeed the need to invest financial resources into such a space. Dr. Vondolia added on to this, by emphasising the need to conduct a cost-benefit analysis as he had earlier mentioned.

After this round of questions from the moderator to the panellist, the floor was open for even more questions from the audience. Below are the questions asked by the audience and the responses given.

Questions and Contributions From Audience.

Question 1: Institutions are falsely blamed all the time even for situations there have no control over. How then do such government institutions come together to achieve this goal of the blue economy?

Response: One way to do this is by corporation. Government institutions must plan, work together and carry out their respective tasks in line with their mandate.

Question 2: How can data be used to achieve the blue economy and what data do we need to achieve our set goals as a continent?

Responses: According to Dr. Vondolia, primary data is important in the development of policy to inform cost-benefit analysis.

Dr. Jacob Nunoo, also mentioned that the surveys from the National Statistical Services could be employed in understanding the blue space much better, however, more data needs to be collected concerning the blue space to advance the blue economy goal.

In addition, Prof. Aggrey-Fynn mentioned that there was the need for countries and their institutions to have central databases that can be assessed by all, instead of each institution having its own database, making data sharing and accessibility a challenge. He further went on to mention the lack of Marine Protected Areas in Ghana, and the conflict that exists between the artisanal fisheries and the oil companies.

From Dr. Sloans Chimatiro's perspective, nations need to set data priorities about the blue economy. This data should be country-specific. In addition, he mentioned that Universities needed to assist in data building and in designing specific programmes, that could fill the gaps as present. Dr Nunoo also mentioned that Ghana as a country had a Sustainable Development Goal (SDG) monitoring team at the Ghana Statistical Service.

Question 3: How can government institutions collaborate? Will it be wrong to focus on specific aspects of the blue economy instead of doing everything?

Response: According to Dr. Sloans Chimatiro, the government cannot focus on only one aspect of the blue economy because the ecosystems are closely linked. However, another factor that prevents the government from focusing on one area is because of the many promises they make during their campaigns, and reading more on the political economy would provide an even better understanding of the issue at hand.

Question 4: How do we ensure data is available, shared and harmonized in these emerging blue fields to enhance proper planning?

Below are some responses given to this question;

Response: According to a member of the audience, data sharing was difficult to coordinate not only in Ghana but in other countries as well. As such, there is a need to have written documents on data priorities. In addition, someone mentioned that at the country level, data should be shared and not kept in institutions. Subsequently, there was the need for the credibility and transparency of data, with a lot of multistakeholder engagement. Prof. Aggrey-Fynn also cautioned that in certain cases, the data published may not be a true reflection of what was on the ground, and getting raw data was also very difficult leading to many discrepancies.

Many more contributions were given to support the discussion and below are some of such contributions.

1. There is a need to create awareness and adopt an integrated approach to coastal pollution.

2. Africans in general, are faced with the challenge of value and resource blindness, which could potentially affect the development of the blue economy.

3. Despite the great efforts made by the African Union in advancing Africa's blue economy, there exists no mapping of its resources.

In conclusion, Dr Nunoo mentioned that the lack of coordination between institutions set to manage or be involved in the blue economy led to an increase in cost. Subsequently, African countries needed to create centralized institutions to manage the affairs of the blue economy, as may already exist in some including Kenya and Tanzania. He also mentioned the need for regional attention to be given to pollution, enforcing laws and supporting research to develop our blue economy.

Dr. Vondolia supported this suggestion by stating that, the proper enforcement of laws would enable the efficient exploitation of blue economy resources.

Prof. Aggrey-Fynn also stressed on the need for Africa's resources to be mapped and value added to these resources, especially since the technology was expensive and that adding value to our resources instead of selling them in the raw forms would be of great benefit to the African continent. He also mentioned that the potential benefit of investing in the blue economy in Ghana alone was worth about 24 trillion dollars.

Sub-theme 1: Sustainable Fisheries Resource Management in Ghana

This session was an Open Forum with the following panel members

Panel Members:

- Mrs. Doris Owusu (Sustainable Coastal Livelihoods Specialist, USAID/Ghana Fisheries Recovery Activity)
- Nana Jojo Solomon (President, Ghana National Canoe Fishermen Council)
- Ruben Jefferson Ocansey (Chairman, Greater Accra Regional Small Pelagics Co-Management Committee)
- Dr. Godfred Ameyaw Asiedu (Policy and Enforcement Advisor, USAID/Ghana Fisheries Recovery Activity)
- Mr. E. K. Ofori Ani (Board Secretary, Ghana Industrial Trawlers Association)
- Mrs. Richner Odonkor (Deputy Director, Marine Fisheries Management Division, Fisheries Commission)

Questions (Q&A)

Question one

A question was asked by the fishermen about the practical ways of reducing the number of canoes in Ghana.

Nana JoJo Solomon answered that fishing is a way of life and tradition for the fishermen so the government has to put in concrete measures in order not to affect the livelihoods of the fishermen. For example, there should be restrictions by the government to stop new canoes from coming into the system**. Question 2 by a Canoe owner in the Western Region of Ghana:**

He asked about the close season this year, which was in July. His issue was, July is a month where they get greater catch however he suggests it should be moved to a

different month. He also added that, does the one month of the close season cause the fish species to reproduce?

Dr. Godwin Asiedu, who is the policy and enforcement advisor. He said that the close season is a form of conserving our species for them to reproduce; however, there will be a general meeting next year 2024 to have a discussion on the month to be selected for the close seasons in Ghana.

Question 3 by a queen fish processor in Cape Coast.

She asked if the industrial trawlers are being moderated since they engage in illegal activities

with respect to the gear or net size they use and also the saiko illegal activities. **Mr Ofori** who is the Board secretary, Ghana Industrial Trawlers Association said that, the industrial trawlers are being monitored at sea especially their gear size they use hence, those who use illegal nets are always punished and this will reduce illegal activities at sea.

Question 4 by a fishmonger.

She asked about insurance activities for the SSF since the trawlers are already on an insurance package by the government.

Dr. Ameyaw answered that the insurance packages will be made to cover the SSF as well. SSF have premix fuel supply and other forms of subsidies already but the insurance packages may be added with time. **Question 5 was by a fisherman in the central region.**

He asked about the conflicts of resource users for example Oil and Gas and the trawlers who always fish in the spaces of the SSF.

Dr. Ameyaw answered that, first of all fishers should articulate themselves very well and form a strong association to fight against such issues.

Question 6:

A fishermen asked that, he has never seen and report on the close season whether it has an impact on the fish stock or not.

Mr. Ofori Ani said though there are assessors for the close season but there are no reports yet for the past years which is a serious issue hence there should be a report so that they stakeholders can testify the importance of it

Comments and Recommendations

Final words from members from the fisheries commission:

Subsidies including premix and outboard motors are shared all year by the government. But we need to consider the impact of the subsidies on fisheries because it may be causing overcapacity hence it should be looked at, as well.

Final Words by the Panel members:

Traditional fisheries or artisanal fisheries may not be the same in some years to come if appropriate measures such as monitoring are not taken to stop illegalities at sea. There is a severe fish stock decline and the livelihoods of the fishermen are in danger as well as food insecurity in ghana.

Final worlds by the Fishermen:

We need much support from the government of Ghana in monitoring the fishers who still engage in bad fishing practices also, we need reports on the close season sessions in order to see the impacts on fishery. However, the government should provide us with insurance packages as well.

Together we work, a Blue economy in Ghana is possible.

Sustainable Fisheries Resource Management in Ghana (Scientific Session)

- This scientific session was moderated by Dr. Isaac Okyere (Centre for Coastal Management/Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana) andDr. Evans Arizi (Centre for Coastal Management/Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana). The session had 19 participants including presenters.

Key Points from Presentation:

Presentation 7 : Joshua Atta Adjei

Illegal, Unreported and Unregulated (IUU) fishing along the West Coast of Africa

Joshua highlighted several key drivers and impacts of Illegal, Unreported, and Unregulated (IUU) fishing along the Western coast of Africa. He identified weak governance and law enforcement, a high demand for seafood, poverty, and unemployment as significant drivers of IUU. The consequences of IUU fishing encompass the depletion of fish stocks, overexploitation, economic losses, adverse environmental effects such as seabed and spawning habitat destruction, water pollution, and food insecurity.

To combat IUU fishing, efforts have been made, including regional fisheries management, vessel monitoring approaches, and the strengthening of legal frameworks and enforcement units. However, these efforts face various challenges, including funding constraints, inadequate alternative livelihood sources for those engaged in IUU fishing, a lack of collaboration among stakeholders, and the isolation of individual efforts.

Presentation 8 :Dr Edna Ekua Kwansima Quansah

Evidence gathering at sea using advanced technology: The case of the "DASE" mobile application

Dr. Quansah's presentation focused on the significant decline in marine fisheries in Ghana, particularly in small pelagic stocks. The decline is attributed to various illegal activities, including the intrusion of industrial fishing vessels into zones reserved for artisanal fishers, the targeting of fish meant for artisanal fishing, and illegal transshipment. Artisanal fishers have historically faced difficulties providing evidence to support their claims of industrial trawlers operating within the inshore exclusive zone.

In response to these challenges, the Environmental Justice Foundation (EJF) developed a mobile application tailored for artisanal fishers. The app leverages smartphones and GPS technology to help them collect evidence of illegal, unreported, and unregulated fishing activities. The progress made includes over a hundred fishers installing the app in the central and Western regions, more than 700 fishers trained on the DASE (evidence) App, receiving over 50 reports from fishers, raising nine alerts submitted to the fisheries commission for further actions and prosecutions, and securing two major compensations for fishers based on evidence provided through the app.

However, several challenges have been identified, including the limited availability of smartphones among fishers, their reluctance to carry smartphones at sea (partially addressed by waterproof pouches), and concerns about security and safety while taking pictures.

Lessons learned from the initiative highlight the willingness of fishers to monitor and report illegal activities when provided with the necessary capacity. The next steps involve extending the DASE App to other coastal communities and regions.

Presentation 9: Cynthia A. Adinortey

Bacterial and fungal loads of the Atlantic chub mackerel during the cooling period of the post-smoking phase: An explorative study.

Dr. Cynthia Adinortey's presentation highlighted the composition of fish, which includes fats, water, protein, and vitamins. Due to its high nutritional value and moisture content, fish is susceptible to microbial spoilage, particularly at ambient temperatures. Fish and fish products are commonly associated with various pathogens, including bacteria, viruses, and parasites. The contamination process begins at landing beaches and continues through processing, storage, transportation, and final display at local markets.

The main objective of the study was to investigate the bacterial and fungal loads in Atlantic Chub Mackerel during the cooling phase after smoking. This research was conducted in five communities as part of the Power to the Fishers Project. The convenience and snowball sampling techniques were employed, with fish processors collecting samples from the topmost tray. These samples were then placed in sterile bags, kept on ice, and sent to the lab for microbiological analysis.

The results showed that the total viable aerobic bacterial load and yeast counts were within acceptable limits. However, levels of Enterobacteriaceae, Salmonella species, and S. aureus exceeded acceptable limits. Communities with poor sanitary conditions exhibited high microbial loads. This highlights the urgent need to educate fish processors about the importance of maintaining a clean working environment and adhering to good hygienic practices. The study also recommends proactive measures for appropriately storing imported or caught fish prior to processing.

Dr. Cynthia Adinortey's presentation emphasised the importance of maintaining hygiene and proper storage practices in the fish processing industry to mitigate microbial contamination and ensure the safety of fish and fish products. Addressing the questions and recommendations can further enhance the understanding of the research and its implications.

Presentation 10: Abdou Matinou Ogbon

Parasites of Sardinella maderensis as potential biological tags for stock identification along the coast of Africa (Benin And Ghana)

Abdou Matinou Ogbon introduced the concept of using parasites of Sardinella maderensis as potential biological tags for stock identification along the coast of Africa, particularly in Benin and Ghana. This approach can aid in better understanding fish populations and their movements.

Presentation 11: Ernest Obeng Chuku (Online)

Spotlighting women-led fisheries livelihoods as a conduit for sustainable coastal ocean governance: A case of the estuarine and mangrove ecosystem-based shellfisheries of West Africa

Ernest Obeng Chuku discussed the significance of women-led fisheries livelihoods as a means to promote sustainable coastal ocean governance. The presentation highlighted the crucial role of women in estuarine and mangrove ecosystem-based shellfisheries in West Africa.

Due to internet connectivity challenges, a recorded version was played for participants.

Documenting the Human Narrative

This was a closed session with media group moderated by Madjiguene Seck of the World Bank, with 25 participants.

- **Peter Kristensen** of the world bank encouraged collaborations between journalists and media houses.
- **Obina Anozie** stressed on advocacy and awareness with the media. And encouraged journalists to cultivate reporting styles that get the attention of policy makers because they have the support and leverage to advocate.
- Kingsley from GBC complained of language barrier by ATLAFCO (French communiques)
- Obina Anozie addressed language barrier issues to use AI tools and other recent software applications.

Media groups interactions with Mel D Cole

Sharyf of Obonu fm asked to know what the driving force behind photojournalism of Mel was

Mel: The drive is the fact that he is human and loves to help people.

Peter Kristensen of the World Bank mentioned that he has been in Ghana for so many years and wondered how Mel, being here just about days ago, had a grasp of all the coastal communities at heart.

Mel: I usually blend with the people so I get to the root of matters and that has been my strategy.

Shirley of Daily Graphic asked Mel of the events that had an impact on him

Mel: Mel mentioned that he had worked with a number of celebrities in the music industry, the likes of Beyonce, Kendrick Lamar, Jay Z and many other superstars which is big deal but the event that really hit him hard was the Floyd murder.

Kingsley also asked to know how Mel starts his projects and how he balances ethical issues

Mel advised that with the advent of phones that have cameras any journalist can just find a problem that moves them and start telling a story with it, with the ethical part it was not tough because he does not exploit or commercialise the photos that he takes.

Ivy Setordji of Joy Fm asked if Mel had encountered any traditional scene like shrines and places like Nogopko

Mel answered that he fantasises to tell such stories

Kaleb Kudah of Citi Fm also wanted to know why there is beautiful stuff in Ghana but foreign media groups troop in on the ugly stuff. He enquired if they can get a balance.

Mel: He said that his stories are usually about purpose and mostly stories that he relates with and tries as much as he can to envision himself in the shoes of people he takes their stories to.

Kaleb Kudah of Citi Fm further asked how Mel protects the identity of children who later want their images off social media

Mel: From a personal view I feel stories need to be told. But then first he is human before everything and hence will like to leave a good legacy for himself and for his son.

Kofi of FCWC asked for considerations in taking pictures relating to the blue economy and fisheries.

Mel advised they should be different and try to create a niche and do what no one is doing.

Thematic Area: Marine Pollution and Management

Session Moderators: Holly Nel, OCCP & Ozgil Calicioglu, World Bank; 21 persons attended this session.

Welcome Remarks by Obed Boakye

It is a great pleasure to be here on this grounds to have an in depth discussion about the blue Economy. Ocean is a source of food for 3 billion. Providing support for the economy of the world. The ocean today is under serious threat for pollution and a threat to human life. This Conference and its huge attendees give hope of an awakening world to protect the ocean.

Ghana has put in place marine protection strategies to help promote sustainability. The world now has the opportunity to navigate international initiatives. Through these conferences and initiatives, the ocean will free itself from pollution.

Sub-theme 4: Marine Pollution and Management

Moderator: Holly Astrid NEL, PhD.

Opening Remarks

Setting the scene: Regional Action for Plastics Management and Circular Economy by Yao Bernard Koffi - Director, Environmental and Natural Resources Directorate , ECOWAS Commission.

Highlights:

Stating the vision of ECOWAS, he commended the ACECoR, School of Biological Sciences, World Bank for putting this conference together. Recommending the works of WAIMO region, which has 8 countries sharing the same boundary, people and language. WAIMO collaborated to work with the 15 countries in ECOWAS. Since their work in 2012, there is a need to find actualisation in the implementation plan. Waste trashed into the ocean goes to the countries hence affecting neighbouring communities.

In conclusion, WAEMO and ECOWAS are trying their best to help but individuals must also take the opportunity to reach out to reduce pollution. Mobilisation of finance from internationals can help reduce plastic pollution.

Keynote Presentation

World Bank support to the preparation of Regional Action Plan on Plastics Management and Circular Economy by Ozgul CALICIOGLU, PhD. Environmental Engineer, World Bank, West and Central Africa, Environment Natural Resources and Blue Economy Global Practice.

Highlights

The speaker sought to address the issue of plastic pollution and how although countries are developing, solutions to this problem are not enough. Drainage systems make regional problems become global. About 7 million tonnes of plastic is produced each day. She encouraged everyone to read through the plastic ebook (MAKA). The motivations and monetisation is not just regional but global. There will be a legal binding treaty by 2024. However, discussions and negotiations are underway to discuss how best these issues can be confronted. Knowledge and opportunities in regions like Ghana should be shared across.

Panel Discussion

West Africa Regional Action on Plastics Management and Circular Economy: Status, gaps, and next steps

- Panel Members: Yao Bernard Koffi, Director, Environment & Natural Resources Directorate, ECOWAS Commission -
- Christophe Deguenon, Director of Environment and Water Resources; Department of Agriculture, Resources in Water and the Environment; WAEMU Commission
- - Oliver Boachie, Senior Advisor to the Minister; Ministry of Environment, Science, Technology & Innovation. -
- Kwame Asamoa Mensa-Yawson, Manager; Ghana National Plastic Action Partnership (NPAP) -
- Sika Abrokwah. Assistant Research Fellow, Centre for Coastal Management, UCC.

Moderator asked the panel members questions related to marine pollution and management practices.

Question: What regulatory practices have been combat marine litter Pollution.

ECOWAS in order to combat marine pollution considers the life cycle of the products. The policy is to reduce the waste generated after the use of the plastic. Using the EPI standard procedure, a financial mechanism was created. The free single used plastics is a major problem. I believe it is better not to produce plastics at all or find ways to manage it. WAEMO, cab help but it is important to collaborate and learn about management and recycling.

QUESTION:

Question 1: What are some regulatory initiative specifics when it comes to the Circular economy.

Speaker 1: ECOWAS in 2008 adopted an environmental policy wing and developed a regional integrated plan. And one of the aims of this wing is to combat pollution. He noted that the principle of reuse, recycling and a clean environment is a feature of a circular economy.

Also in the sense of management of waste they have a provision in terms of taxes, and fees that the producer, importer and exporters must bear. He also mentioned the principle of Extended Producer Responsibility (EPR).

To conclude, he recommended collaboration in the region in terms of sharing technology, knowledge and other policies.

Speaker 2: WAIMO also has a similar principle on circular economy but what she hammered on is the principle of producer responsibility. The fact that the single used

plastics are the main source of the problem because it is free in her country. And she noted on a key point that we should encourage people to reduce their usage of plastics. She also commended Ghana's effort to reduce waste and recycling of waste in the country and added that collaboration within the African region will help us improve and increase our efforts. In conclusion, we should ensure that it is not a right to pollute but we should only produce and use plastics that we do not have any other alternative for.

Question 2: Challenges and opportunities for coordinating such a complicated sector speaker 3: As a region, we face similar problems.

First challenge has to do with policies, regulations and standards within each country of the region.
Secondly a functioning circular economy needs huge sums of financing. He mentioned that we should be able to produce plastics that are recyclable. He also added that collaboration in the region is key to solving this problem e.g setting up a regional coordination where one country is equipped to recycle the waste and other countries do other things to help manage it.
Thirdly education and awareness creation within the region. He also mentioned lastly that our informal sector contributes largely to the problem.
He concluded resources should be provided for capacity building of moving towards a circular economy.

Speaker 4: Most of the waste happens because of the full life span of the plastic in question.
Je mentioned that there is-an ongoing discussion on conveying a task force system to ensure proper waste management

Question 3: How do we know that all these policies and regulations are making the impact we're anticipating

Speaker 5: Monitoring is key to ensuring that policies are effective
Also a regional action plan is more efficient than the one country action because the regional action plan helps to track where this waste is coming from and where it ends up.
She added that without baseline data we will not know the impact or progress we have made with these initiatives and policies.

Also she hammered on collaboration and harmonisation of policies within the region in terms of data usage, capacity building and technology which will harness our efforts

Recommendations from audience

- Financing robust mechanics is key to solving this problem
- There should be research to quantify how much waste we're looking at. This will inform policies and other initiatives
- Also a panellist added that the harmonisation of policies within the region is really important to solving waste problems.
- As a region, we need to work together to ensure coordination of plastic production and waste management. And there should be inclusiveness of both academics and laymen in the region in finding a solution to the waste and pollution.

In conclusion, waste management is possible. We can achieve it.so there's a need to keep working at it.

SPECIAL CLOSED-DOOR SESSION

Bilateral Talks between Zanzibarian-Ghanaian Delegation on a Partnerhsip to Promote the Blue Economy in Zanzibar

A bilateral talk was held between Tanzanian/ Zanzibarian and Ghanaian Fisheries Stakeholders which was moderated by Mr. Sajid Anwar, World Bank.

There were 15 participants from the Ministry of Blue Economy (Zanzibar); Ministry of Livestock, Fisheries and Aquaculture (Tanzania); and Ministry of Fisheries and Aquaculture Development, Fisheries Commission, Leadership of Local Fishermen Union, and Academia (Ghana).

An agreement was reached for a partnership between both countries for knowledge sharing.

SN	Name	Institution
1	Mr. Sajid Anwar	World Bank
2	Prof. Riziki S. Sheomdoe	Ministry of Livestock and Fisheries, Tanzania
3	Dr. Sware I. Semesi	Marine Parks and Reserves, Ministry of Livestock and Fisheries, Tanzania
4	Dr. Salum S. Hamed	Ministry of Blue Economy and Fisheries, Zanzibar
5	Mr. Zahor K. M. El Kharousy	Ministry of Blue Economy and Fisheries, Zanzibar
6	Ms. Rebecca Sackey-Mensah	Fisheries Commission, Ghana
7	Mr. Nettesheim Kwame Damoah	Fisheries Commission, Ghana
8	Mrs. Hannah Adjei-Boakye	Fisheries Commission, Ghana
9	Mr. Joseph Yeboah	Fisheries Commission, Ghana
10	Mr. William Agbenu	Fisheries Commission, Ghana
11	Prof. Francis K. Nunoo	Fisheries Commission, University of Ghana

12	Prof. Denis W. Aheto	Centre for Coastal Management, University of Cape Coast, Ghana
12	Mr. Nana Jojo Solomon	National Canoe and Fisherman Council, Ghana
13	Dr. Angela Lamptey	University of Ghana
14	Dr. Morten Pedersen	Consultant, World Bank
15.	Mr. Joshua Adotey	Centre for Coastal Management, University of Cape Coast, Ghana

Moderator: Sajid Anwar

Prof. D.W. Aheto introduced the session with a proposal from the Lead Secretary for the Blue Economy Ministry in Zanzibar, Prof. Zahor Elkharousy. He announced the session was needed to enhance collaboration between both countries because of the common activities in fisheries and aquaculture, and the emerging Blue Economy, particularly in tourism and sustainable fisheries management. He added that the session was important because the World Bank is interested in the outcomes. According to him, knowledge-sharing between countries is required to enhance capacity building which ACECoR is ever ready to foster.

He further underscored the need for a regional-level conference on the Blue Economy which he announced the Tanzanian-Zanzibarian government has already expressed willingness to host. He ended by calling for a tripartite Memorandum of Understanding (MoU) between both countries and the World Bank to forge the knowledge-sharing partnership ahead.

Briefing from Zanzibar

The delegation from Zanzibar led by Prof. Riziki S. Sheomdoe and Dr. Salum S. Hamed identified some challenges and emerging issues in their Blue Economy sector in Zanzibar that need knowledge sharing to solve:

a. Problem of overfishing and unsustainable fishing as a result of unregulated canoes
b. Unproductive loans for canoes
c. More fishing done in fresh ecosystems irrespective of vast coast
d. Construction of modern fishing harbour
e. Discourage transshipment in foreign countries after fishing from Tanzanian shores

f. Seaweed harvesting
g. New programme for Building better tomorrow through Entrepreneurship directed at youth and women
h. Cage farming- aquaculture development
i. Sustainable fisheries scaling and aquaculture management project
j. Reduction of post-harvest losses in an Eastern Africa Coastal Areas Management Programme
k. Call for a continental programme to bring all coastal and marine stakeholders together
l. Expressed interest in hosting the next conference in July 2025

Briefing from Ghana

The Ghanaian delegation led by Prof. Francis K. Nunoo assured Zanzibarians of Ghana's preparedness to engage with them to foster their prospects which he believes will also be for the common good of both countries. He welcomed the MoU with the corresponding partners as universities in Ghana and both governments to achieve the objective. He ended on the note that a good understanding of the problem, available data and a strong political will are essential for a take-off.

Key issues:

Mr. Anwar then welcomed a presentation from the Zanzibarian counterpart on the main issues at hand:

The following are highlights of the presentation from the Zanzibarian counterparts on the **Zanzibar Blue Economy Agenda:**

a. Zanzibar is an archipelagic nation- the island section of Tanzania with 2 islands; 53 islets; and 1.7 million people
b. Driving sectors of the economy are tourism and fisheries contributing 4-5% of GDP; and the entire ocean contributing 47% of GDP
c. Zanzibar has the vision of becoming the leading hub in Western-Indian Ocean region by the development of Fisheries and aquaculture; Tourism; Maritime trade and infrastructure; Marine Energy; and Blue Economy governance
d. Has dedicated ministry to the Blue Economy
e. 95% of fisheries is mainly marine capture; 50,228 fishers; catch 61,100 mt
f. Established Marine Conservation Areas in both islands
g. Zanzibar aquaculture development strategies
    - Seaweed farming: 12000 t produced every year; 85% women engaged, 90% exported as raw materials
    - Opportunities for fish farming which is at the infancy stage

- Other sea farming; sea cucumber- 12000 t produced and exported to Asia
- International/bilateral partnerships so far include Korea

h. Investment opportunities for the Blue Economy
    - Fish and fish feed processing
    - Seaweed processing plant
    - Boatbuilding
    - Fish port
    - High and deep-sea fishing in Public-Private-Partnership mode
    - Storage facilities
    - Training

Response from Ghana

Prof. F.K. Nunoo on behalf of the Ghanaian delegation welcomed the opportunity for partnership, considered as a way to strengthen the BE development agenda. He noted that Ghana's sectoral outlook is not much different from Zanzibar except in capture fishery, existence of fisher unions, and the unavailability of seaweed farming. Mr. Nana Jojo Solomon added that small-scale fisheries in Ghana have about 12000 fishers, and 8000 -1000 canoes and locally discourage single canoe ownership

Interventions

Mr. Anwar asked the Zanzibarian delegation to enumerate some challenges on the high seas. The following were thus presented:

a. Inefficient canoe licensing regime
b. Lack of strong fisher unions

Mr. William Agbenu asked if seaweed is harvested near the shore or offshore in Zanzibar and if the availability of raw materials or infrastructure is the requirement for fish feed processing:

The Zanzibarian delegation responded that seaweed farming is done in low tides and at all parts of the shore, and that technology and infrastructure development is the need now since raw materials are available.

Resolutions

Prof. Nunoo proposed the establishment of a focus group and a 2 to 3-day workshop to start with the MoU. He also asked for short-term dialogue to identify and upscale existing common trade agreements between both countries.

The Ghanaian delegation nominated Prof. Aheto as its focal person to spearhead the MoU and to be supported by Prof. Nunoo. The Zanzibar team also nominated Dr. I. Sware Semesi as its focal person.

Mr. Anwar assured both parties of the World Bank's financial support. Mr. Anwar assured of support for a 3-day workshop.

The Zanzibarian delegation also requested to meet with the Chief Director of the Ministry of Fisheries and Aquaculture Development. Prof. Nunoo assured them of arranging the meeting the next day.

Conclusion:

The moderator, Mr. Anwar commended the Zanzibarian delegation for showing interest in developing the Blue Economy of Zanzibar through bilateral partnership and knowledge sharing. He also appreciated the Ghanaian counterpart for warmly welcoming the proposal.

DAY THREE – 8TH NOVEMBER 2023

Recap of Day 2 activities and overview of day's agenda by Ms. Ivy Gyimah. She recapped the importance of the blue economy, challenges and benefits as well as how to effectively maximise the full potential of the blue economy.

Presentation from the University of British Columbia on scholarship programme by Prof. William Cheung and Prof. Aheto

Professor Rashid Sumaila and Prof. William Cheung talked about African UBC fellowship on fisheries. UBC has created 13 positions for black professors and indigenous people. Two-selection committees will be formed from ACECoR and UBC. Initial selection of students will be from 10-12 and the final selection is done by UBC. Professor Rashid Sumaila explained the need for gender balance in educational opportunities. Application of the fellowship will be in February and students will be expected to report by August.

Prof. Aheto talked about ACECoR being open to partnership and transformative research. He further talked about their collaboration with other expertise all over the world.

Presentation of Resolutions from Fisher Groups by a representative

The Central region by Nana Ababio (Ghana National Canoe Fishermen Council). He thanked the various NGOs involved in fishing activities. He stated that fishers are bothered by the illegal fishing activities eg. IUU, illegal mesh sizes etc.

The Western region by Dominic Dadzie and John Abaka Adu
He expressed this gratitude to the NGO actively involved in fishing activities. He expressed his concerns as to whether the blue economy space will have plans for fishers.

The fish mummies in the Western region
She stated that she will be happy with the blue economy initiative, but they should be actively involved in the blue economy agenda.

Fish processors from the Central Region by NAFTA representatives from the Central region. She expressed her concerns on the use of illegal means of catching fish. We pleaded with the Government agency and development partners to help solve the issue.

The Volta Region by Seth regional Vice-President of the Ghana National Fishermen Canoe
He expressed his appreciation for the conference, importance of the mangroves. He however stated that the dam spill has negatively affected fishers in the region.

Secretary for the Chief fishermen council
He expressed his appreciation for the invitation and the need to protect our fisheries.

From the Greater Accra region
They expressed their gratitude to the organisers for organising the conference in the greater Accra region and that he will endeavour to educate his members about the blue economy imitative when he goes back.

Rueben Okanfei regional chairpersons for small pelagic co-management
He spoke about unity in the fisheries sector; he explained that they should be involved in the blue economy initiatives. He expressed his dissatisfaction on the MPA claiming

that it will limit fishers' space but if they are involved in the processes, it will help in the sustainability of the initiative.

Musical Interlude

Ghana Industrial Tuna's Association

He stated that tuna are managed by ICAT; he stated that they play close to 25% taxes on tuna. In addition, there are 37 vessels registered currently however only six of the pole and line are active. Tuna exports contribute 200 dollars with Ghana being ranked the first. He stated that cost of maintenance is a problem in Ghana and that the Ghana Maritime Authority trains navigators and not fishers. He talked about the issues of piracy in the Gulf of Guinea. It is challenging because when tuna migrates to Benin, they cannot exploit it because they have arms on their vessels.

Ghana Industrial Trawlers Association

Cost of operation and more research in the industry. They are calling for development partners and collaborators between industries and educational institutions. He stated that they feel marginalised with the introduction of the oil and gas industries.

Brief Remarks by Partners – World Bank-WACA, Cefas, GFRA, etc.

From Michelle Diez from Pro-Blue (World Bank)

She talked about them providing more than 100 billion financing on the blue economy. Pro-Blue. She stated that they are working from West Africa to East Africa. Blue economy for resilient Africa program launched at COP 27 aimed to improve the blue economy. She stated that Data, analytics, Institutions, and policy reforms are needed to ensure a sustainable blue economy.In Ghana, they are helping the country to produce a model for blue carbon. Scaling up of resources available and MSP's will add to a sustainable blue economy.

Dr Holly Nel, Centre for Environment, Fisheries and Aquaculture Science (Cefas)

She talked about the Ocean country partnership programme; bilateral programme with UK and Ghana. It involves marine pollution, fisheries and MPA's.
OCCP is supporting 12 scholarships to study at UCC.

Heather D'Agnes, Ghana Fisheries Recovery Activity (GFRA)

She talked about Ghana Fisheries Recovery Activity and their mission to improve the fisheries sector in Ghana. She also thanked UCC for their Partnership on the project.

Dr.Obinna, African Union – Interafrican Bureau for Animal Resources (AU-IBAR)

He talked about policy formation and reforms being implemented by AU-IBR. He stated that there are eight African centres of Excellence in Africa. He talked about projects executed by ACECoR.

Prof. Prateep Nayak, V2V

He stated that various African countries were implementing V2V. He mentions UCCACECoR as partners. Creating platforms and collaborations as well as inclusiveness will help to reduce vulnerability. He talked about the role of V2V in small-scale fisheries. He also thanked all the organisers of the conference.

Fisheries Commission

The representative She expresses her gratitude for choosing such a comprehensive theme for the conference. She also thanked UCC. She appreciated the world bank and hoped for further collaborations. She thanked all the conference participants for coming.

Presentation of Resolutions by Nana Nkanomako IV

She stated that she is illiterate due to the number of children in her family. She emphasised the need to support the children of fishers. She added that data quality needs to be enhanced, small pelagic fisheries promoted, and premix fuel should be made readily available. She touched on plastic management and inclusive blue economy in Africa.

Presentation of Communique

The Communique was read by Ms. Ivy Akuoko Gyimah. She stated that components of the conferences, 290 in person and 200 online, 15 countries in Africa and beyond from Research institutions, academia, NGOs and governmental organisations. Fishing industry contributes about 1.2 % of Ghana's GDP. She called on all stakeholders and

institutions to implement the moratorium, small scale fisheries prioritised, reduce overcapacity, implement MSP, improvement of involvement of coastal communities, promote data quality, strengthen collaboration, mobilise resource capacity, promote knowledge sharing platform. The next Conference on Fisheries and Coastal Environment is proposed to be hosted in 2025 in Tanzania.

Closing Remarks, Professor Moses Jojo Eghan, Provost, College of Agriculture and Natural Sciences

Highlighted the ranks of UCC, Thanks dignitaries, invited guests, students and fisherfolks. Implores that we reflect on the theme of the conference. Gave an account of the keynote speakers, and advised that we thread on the earth as if it were a human being. He then gave an account of the highlights of all the educational sessions. He ended his remarks by thanking the organisers who he acknowledged have done a great job. He also thanked all the attendees for their thought-provoking participation and ended by reminding the audience of the commissioning of the Ocean Institute.
He wished everyone a safe journey and drew the curtains.

Appendix 1: List of institutional affiliations of participants at the conference

1. Ainoo-Ansah Farms Ltd
2. AU IBAR
3. AU-Policy Research Network for Fisheries and Aquaculture
4. Cefas
5. Centre for Coastal Management- Africa Centre of Excellence in Coastal Resilience
6. Centre for Natural Resources and Environmental Management (CNREM)
7. Coordinator Aps
8. Development Action Association
9. Environmental Justice Foundation, EJF
10. Esquare Seafoods
11. FAO (Regional Office for Africa)
12. Fish Processor
13. Fisheries Alliance
14. Fisheries Commission
15. Forestry Commission
16. GBC /JRFE
17. Ghana Industrial Trawlers Association (GITA)
18. Ghana Maritime Authority

19. Ghana Standards Authority
20. Ghana Tuna Association
21. GMA
22. GNCFC
23. Institute for Poverty, Land and Agrarian Studies, University of the Western Cape PLAAS, UWC
24. Jubilee Radio
25. KNUST
26. Laboratory of Applied Ecology/University of Abomey-Calavi
27. Lagos State University
28. Malawi University of Business and Applied Sciences
29. Marine Parks and Reserves Tanzania
30. MX24 Media Limited
31. Small pelagies and co- management committee
32. SPCC western region

33. Université Alassane OUATTARA de Bouaké
34. University of Cape Coast
35. University of Ghana
36. University of Liverpool
37. Wageningen University
38. West African Economic and Monetary Union
39. World Agroforestry (ICRAF)

Appendix 2: List of hotels where participants were lodged

1. Ange Hills Hotel
2. Erata Hotel
3. From home
4. Golden Crystal Experience
5. Golden Key
6. I was not at any Hotel
7. Mensvic Grand Hotel
8. Mj Grand

9. Movenpick
10. Sonia Hotel, East Legon
11. Yiri Lodge, University of Ghana

Appendix 3: Some feedback from participants highlighted the need for improvement

1. Break not enough for networking
2. Broaden the scope beyond Ghana
3. Build human capacity to facilitate the attainment of the Blue Economy that Africa wants.
4. Closing ceremony
5. COVID-19 protocols and medical emergency service station
6. Cut down the plenary and include more breakaway sessions
7. Documents sharing, report and support documents
8. Presenters can be allowed to control their own slides with the remote but being controlled by another.
9. Exhibition stands must be announced to participants and toured by the special guest of honour after the opening day ceremony.
10. Fee payment
11. Feeding arrangements (no packaging option) not flexible for conference participants who are in one way or the other engaged 12. Gender balance in the panellist on panel discussions
13. General participation by everyone during the breakout sessions to avoid loitering and noise on the corridors
14. I think there may have been too many sessions and the time management could have been better.
15. Increasing the number of days
16. Internet connection should be provided all the time with the highest level of efficiency and effectiveness
17. Involvement of women's participation
18. It would have been helpful if every presenter had the opportunity to present to everyone at the conference.
19. Lunch was usually late
20. Make provisions for translation to support those who can not speak English.
21. More panel sessions
22. More time for questions and answers
23. Most of the sessions were very packed, hence poor time management. Reduce some sessions as much as possible. If possible, make available hotels and let

participants take care of their accommodation without including it in the registration costs

24. Need for work on coordination
25. Participants must have certificates at the end of the conference
26. Pictures from the breakout sections
27. Plenary sessions
28. Poster session
29. Pre-program communications should be improved so participants know exactly what to do in order to not be left in the mud.
30. Providing more opportunities for structured networking and interaction among attendees would be beneficial. Although informal networking does occur naturally, having designated networking sessions or activities would facilitate meaningful connections and discussions among conference participants.
31. Publicity
32. Quality of presentations and venue (improving lecture rooms in the university to "conference standard" might be a better option).
33. Reducing the number of presentations within parallel sessions may serve to enhance participant engagement with the speakers.
34. Scope for more academic input (in plenary sessions) about key themes
35. Some plenary sessions should be allocated to deliberations in local languages by the fisher folk.
36. Souvenirs and conference materials especially soft copy or hard copy of presentations be made available.
37. Technical aspect
38. The exhibition session was too short
39. The full involvement of all ACECoR students especially those reading Blue Economy
40. The hotel accommodation was poor. The toilet/bath tub was leaking all the time
41. The internet provision and availability of ushers to provide timely information
42. The participant's engagement in the sessions
43. There should be language translation for French because most of the Frenchspeaking presenters struggled
44. Time management especially during the plenary session, time for networking i.e. conference cocktail or dinner. There were so many distinctions/barriers between the high-level guests and other participants which defeated the point of academic conferences, networking, and mentorship. The chairs were really uncomfortable as many participants struggled to work on their laptops, next

time tables should be provided having that this was an academic conference.
45. To have this conference held in other AU Member States

46. Transportation
47. Travel arrangements. I mean support the transport (flight ticket) to the conference.
48. Use a facility with better breakout rooms, some were too small and had challenges with air conditioning and sound.
49. Was expecting to see some key stakeholders e.g the navy, NDPC etc. I recommend the key stakeholders to be invited
50. We would love to gotten presentation from achievements out of the recommendations from the previous conference or conferences.
51. You should have invited some fishermen to this conference because they are also part of coastal zones stakeholders

Appendix 3: Key "further comments" by participants about the conference

1. Better Communication arrangement with participants who don't have proficiency in English
2. Congratulations on bringing so many different interests together for this very successful conference
3. For the local fisher groups, pre and post-conference engagements will enhance their effective participation. Also some participants were not present at the conference room at the start of the sessions, especially 1st sessions and after lunch
4. Great to have the conference move to Tanzania in 2025. Let's keep it moving across Africa to promote the Blue Economy agenda.
5. Hotel accommodation should be left to participants to decide in accordance with budget limits
6. I would like to appreciate the organizers
7. I would like to leave the hotel the Day after the end of the conference.
8. It was very educative and inspirational. It has shaped my thought
9. Maritime security governance should be an integral part of this conference.
10. Meals needs to be varied
11. More engagement and technical session with the media
12. More sensitization on the blue Economy to the Fishers
13. Take the conference to continental level

14. The conference next time should be held outside Accra and preferably on a coastal community.
15. There was no first aid stand to take care of health emergency.
16. You have done well by bring onboard the fishing industrial players, academia, researcher's etc. for this conference and hope this will continue for both conferences, seminar's etc. as a think tank to share experience for best results.