THE REPORT OF THE GLOBAL OCEAN OBSERVING SYSTEMS IN AFRICA (GOOS-AFRICA)

April, 2022 - April 2025

Introduction

The Global Ocean Observing Systems in Africa (GOOS-AFRICA) was established in the framework of the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM), Maputo, Mozambique, 18-25 July 1998.

The Twentieth Session of the Assembly of the IOC (June, 29 – July, 9, 1999) adopted Resolutions XX-20, XX-21 and XX-22, endorsing the outcomes of the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM), and Priority Africa, including GOOS-AFRICA. It is worth noting that the IOC Assembly instructs the Executive Secretary of the IOC to "undertake, in consultation with African Members States and the GOOS-AFRICA Co- ordinating Committee, the necessary action as recommended by the PACSICOM resolutions, to convene a workshop for drafting a project proposal for the implementation of GOOS in Africa under the leadership of that Co-ordinating Committee and the Scientific and Technical Research Commission (STRC) of the Organization of the African Unity". The founding Coordinator and Technical Secretary of GOOS-AFRICA, under the leadership of the GOOS-AFRICA Co-ordinating Committee and the Scientific and Technical Research Commission of the Organization of the African Unity, and with the support of the GOOS Director at that time, mobilised the necessary resources, enabling a series of successful science-policy interface workshops involving scientists, managers as well as high-level governmental policy makers, United Nations institutions, Regional Conventions related to oceans and coasts in Africa, non-governmental organisations, other public and private partners including international and regional development and financial partners, industries notably the International Association of Oil and Gas Producers in the world. The outstanding resulting project proposals for Regional Ocean Observing and Forecasting Systems in Africa (ROOFS-AFRICA) through these wide Pan-African and international consultations strongly consolidated the foundations of GOOS-AFRICA as a viable framework for operational oceanography in Africa.

Recognizing this immense achievement, the UNESCO General Conference through its 35th Session (35C/5, Paris, 6-23 October 2009) decided to establish a specific professional post dedicated solely to support GOOS-AFRICA with the aim to ensure the sustainability of the coordination and to consolidate African efforts towards the full implementation of the Pan-African Framework for Ocean observations, monitoring, forecasting and predictions.

However, the Executive Secretary of the IOC at that time cancelled the recruitment process which already started for the GOOS-AFRICA position. This cancellation with no respect and consideration to African Member States, needs and priorities seriously damaged the fast-growing progress of GOOS-AFRICA. This detrimental action ignores the sovereign decision of the General Conference of Member States, which is the supreme governing body of UNESCO, and despite the priority status given to Africa and its programmes within UNESCO and its IOC,

The IOC Sub-Commission for Africa and the Adjacent Island States (IOCAFRICA) was established at the 26th Session of the Assembly of the IOC (June – July 2011, Paris, France) with a technical secretariat based at the UNESCO Regional Office in Nairobi, Kenya.

It should be noted that while GOOS-AFRICA has been very successfully operating under the vibrant leadership of its Coordinating Committee, it appeared that since the establishment of the IOCAFRICA, the IOC-UNESCO Paris based Secretariat leadership through a number of bureaucratic, confusing, inappropriate and misleading actions seriously weakened the momentum of the GOOS-AFRICA Coordinating Committee, and hence hampered the overall successful operations of the GOOS-AFRICA as a whole. These bureaucratic actions include the cancellation of the position for GOOS-AFRICA coordination, the confusion created by the IOC-UNESCO Paris based Secretariat leadership between the IOCAFRICA Secretariat, IOCAFRICA elected officers, and the GOOS-AFRICA Coordinating Committee. In fact, all these three structures are distinct by nature.

This well-known situation of role confusion led the GOOS Steering Committee, held in Singapore 11-13 September 2017, to request the representative of Africa and the Arab States within the Steering Committee to resolve this issue. Thus, point 6.2.2 of the final report of that meeting requested the representative of Africa within the steering committee to formulate an action aimed at resolving the political impasse regarding the governance of GOOS-Africa, arising from the confusion of roles with IOCAFRICA

Due to lack of support of the IOC Secretariat, GOOS-AFRICA Coordinating Committee mobilized the support of the Ivorian Government and the African Union Commission through the GMES & AFRICA project, enabling the revitalization meeting held from 13 to 16 December 2019 in Abidjan, Côte d'Ivoire.

The revitalization process strengthened the renewed Coordinating Committee which organized a series of activities during the period 2022–2025 as follows:

1- IMPLEMENTATION OF THE PARTNERSHIP WITH THE AFRICAN UNION THROUGH THE GMES & AFRICA PROGRAMME.

Strategically, GOOS-AFRICA and GMES & AFRICA agreed to engage in a win-win partnerships to support ocean observations, monitoring, forecasting and predictions in Africa, thus contributing inter alia to the implementation of specific objectives and tasks of relevant African institutional frameworks and initiatives such as the 2050 Africa's Integrated Maritime Strategy (2050 AIM Strategy), the Africa Blue Economy Strategy, the African Union's NEPAD Coastal and Marine Action Plan, the African Regional Seas Conventions, the Decade of African Seas and Oceans, as well as international frameworks such as the WSSD Implementation Plan, the Millennium Development Goals, the United Nations Sustainable Development Goals, the United Framework Convention on Climate Change, the United Nations Convention on Biological Diversity, the United Nations Decade of Ocean Sciences for Sustainable Development (2021-2030)[1] .

The strategic alliance towards a win-win collaboration between GMES & AFRICA and GOOS-AFRICA on in-situ ocean observation and forecasting systems in Africa was agreed at the first

Continental workshop on Coastal and Marine Areas from 4 to 6 July 2022 in Accra, Ghana[1], attended by high-level experts from Africa.

Subsequently, a focussed meeting was organised with the specific theme on collaboration between GOOS AFRICA and GMES & AFRICA in Kigali, Rwanda, 24 - 28 October 2022. At this meeting, several actions of common interest between GMES & AFRICA and GOOS-AFRICA were proposed for joint implementation to promote a qualitative leap in oceanography in Africa and strengthen the Africa components of the ocean observations network as part of the overall development of the Global Ocean Observing System (GOOS).

1.1- Joint GOOS-AFRICA/GMES-AFRICA Meeting in MOMBASSA: 25 -27 Septembre 2023

The main objectives of the meeting were to review the matrix, and the activities defined in Kigali in 2022 as following:

Activities and Deliverables

Activity	**Deliverable**
support in setting up of the GOOS AFRICA Secretariat in CURAT, Côte d'Ivoire including an executive committee	Operational secretariat
support GOOS AFRICA to create synergies with other AUC departments notably the Blue Economy Division and Disaster Risk Reduction; Nairobi and Abidjan Conventions and UNEP for Ocean governance among others, thus performing the function of an umbrella organization for coordination and ensuring science-to-policy linkages	Progress reports
support GOOS AFRICA in preparing an inventory of current status of continental ocean observations (platforms, equipment, personnel) and relevant African capacities, institutions, programmes and competencies on Operational Oceanography with a view to identifying sectoral priorities and gaps in implementation	Status, Baseline and Progress Reports of state of play
support GOOS AFRICA, in collaboration with the GOOS AFRICA Coordinating Committee and stakeholders, to develop a Strategic plan for 2023-2027 that will include proposal for development of an Ocean Development Fund for Africa	Report
support GOOS AFRICA in joint planning of two workshops with the Marine Consortia and other stakeholders	Workshop report

support GOOS AFRICA in training of trainers workshop to update their activities and skills to facilitate African Home-grown approach to Ocean Science	Training report
support GOOS-AFRICA in carrying out a workshop to prepare a programme or a project to be summitted to UN Decade of Ocean Science for Sustainable Development, building upon the concept note to be prepared by a group of experts.	Workshop report
support GOOS AFRICA in Improving linkages with national institutions.	Progress reports
facilitate GOOS AFRICA in the sharing of information and participation in global forums concerning Operational Oceanography and facilitate common position of Africa in the global forum	Reports

1.2 Meeting in Sharm El-Sheikh (Egypt): 27 – 30 November 2023

At this meeting, only one action was selected: to hold an in-person meeting to provide greater visibility for GOOS AFRICA's activities, supported by GMES & Africa. The objective of this meeting should be to:

- Refine the Long-Term Vision of GOOS-AFRICA; and agree on a three-year Strategic Action Plan (2024-2026)
- Identify current and required Infrastructure and Equipment
- Review the Organisation and Coordination of GOOS-AFRICA
- Identify partners towards fruitful collaborations.
- Examine a Strategy for Capacity empowerment
- Agree on priority areas for ocean observations
- Select the Essential Ocean Variables to be measured.
- Investigate Data Quality Standards and Technology Innovation Solutions
- Define a Communication Strategy
- Define an Education and Awareness Strategy
- Define an Evaluation Strategy for Regular Ocean Observations
- Define a Timeline for implementation of agreed activities
- Establish a mechanism for a continuous review and update of the Strategic Plan

1.3 GOOS-AFRICA Meeting in Abidjan Abidjan Mai 2024

The workshop was officially opened by His Excellency Mr. Jacques ASSAHORE, Côte d'Ivoire's Minister of Environment, Sustainable Development, and Ecological Transition. He was accompanied by other dignitaries, including the Chief of Staff representing His Excellency Prof. Adama DIAWARA, Minister of Higher Education and Scientific Research, Prof Ballo ZIE, Vice Chancellor of the University of Felix Houphouet-Boigny (UFHB), Dr. Tidiane OUATTARA, President of the African Space Council, African Union Commission, Prof. Kouadio AFFIAN, Chair of GOOS-AFRICA, Dr. Bahir SALEY, Coordinator of GMES &

Africa, African Union Commission, and Mr. Justin AHANHANZO, founding Coordinator of GOOS-AFRICA, representing UNESCO.

Achievements

Based on a budget line allocated to GOOS-AFRICA at the IOC of UNESCO Assembly in June 2023, as well as the support of GMES & Africa to achieve common goals, a strategic reflection was necessary to select the immediate activities to be carried out, and to include in a medium-term action plan for GOOS-AFRICA. Consequently, the following key results have been achieved.

- An identification of current and required Infrastructure and Equipment
- A three-year Strategic Action Plan (2024-2026) refined
- The Organization and Coordination of GOOS-AFRICA reviewed
- The partners towards fruitful collaborations are identified.
- A Strategy for Capacity empowerment was examined
- Priority areas for ocean observations agreed on
- Selection of the Essential Ocean Variables
- Data Quality Standards and Technology Innovation Solutions
- A Communication Strategy defined
- A Timeline for implementation of agreed activities defined

1.3.1 Other Continental and Regional Programmes / Initiatives

GOOS-AFRICA partnered with several other continental and Regional Programmes / Initiatives, including : FUTURO Programme, SEAWARD Africa Decade programme, MarCNoWA and MarCOSIO consortia, Blue Belt Initiative, …

1.3.2 Current state of Ocean Observations: Country Reports

Seven technical presentations on ocean observations and status of oceanographic infrastructure in different countries within Africa were delivered during the workshop; these covered the Central Africa (2), North Africa (1), West Africa (3) and South Africa (1) regions.

1.3.3 Brainstorming on the GOOS-AFRICA Strategic Plan

Critical issues raised for consideration in the design of the strategic /implementation plan document(s) are:

1. Clarity was sought regarding the governance structure of GOOS-AFRICA and the Coordination Committee membership.
2. Group discussions focused on broad issues of identifying a long-term vision for future growth and impact of GOOS-AFRICA, considering emerging challenges and opportunities in the fields of oceanography.
3. The need for critical information on physical, chemical, and biological essential ocean variables to deliver climate operational services and ocean health in African countries and small island states was underlined as the driver for the strategy development.
4. The mission of GOOS-AFRICA, therefore, is to lead the ocean community and create partnerships to develop an integrated, responsive, and sustained observing system.

5. A gap analysis was undertaken for the development of the Ocean Decade Africa Roadmap, hence, valuable information should be referenced to enumerate the different categories of the SWOT analysis for the Strategic plan. Similarly, the recommendations from the Kigali report need close consideration in the preparation of the strategic goals and objectives aligned to the GOOS 2030 Strategic plan while taking into account the unique African landscape.
6. It was argued that a GOOS-AFRICA Implementation plan may be more pragmatic in the three-year time frame within which initial funding is available. It was proposed that GOOS-AFRICA Implementation plan should focus on Ocean Decade Roadmap Priorities 5 (*Strengthening multi-hazards early warning systems and community resilience*), 6 (*Ocean Observations and forecasting systems for Africa*), 7 (*Digital twin for Africa - Establishing an African Ocean Knowledge Hub*), 8 (*Strengthening capacities and skills of African Early Career Ocean Professionals (ECOPs*) and 9 (*Regional ocean literacy programme*) while referring to the actions of the SEAWARD Africa Programme.
7. GOOS-AFRICA should foster strategic partnerships with other GRA and wider GOOS community, Africa Ocean Decade Taskforce, African Union Commission (AUC), WMO, GMES & Africa (MarCOSIO and MARCNoWA), Regional initiatives and organisations – WIOMSA, Nairobi and Abidjan Conventions, BCC, multilateral efforts, LMEs, etc., as well as research institutions, universities, government agencies, and industry partners
8. The diversification of revenue streams for funding to support GOOS-AFRICA operations was explored to reduce dependency on government and traditional funding sources. Such may include venture capital as an innovative source of funding for projects, especially those targeting youth and other private-public partnership arrangements and industry (private sector) Corporate Social Responsibility (CSR) activities, especially the oil industry and others involved in Blue Economy activities.
9. There was also a recognition that national governments should be more proactive in investing resources to assist with the maintenance of infrastructure (e.g., tidal gauges) acquired through international collaborative initiatives in order to achieve a higher standard of sustainability. One approach to achieve this is creating a Community of Practice (CoP) with dedicated GOOS-AFRICA technicians responsible for assisting with the prioritised EOV observing systems, maintenance, and training.
10. The need of strengthening continental and international collaboration by participating in joint research initiatives was emphasized, and RCCR used as an example of potential collaboration, including others such as the European Observation and Data Network, European Space Agency (ESA), EUMETSAT, the First Institute of Oceanography (FIO) of China, Second Institute of China, among others.
11. It was stated that Ocean Observations must address important management processes (e.g. MSP) so that the collected data supports both scientific research interest and science for management and policy making issues.

During the plenary discussions, it appeared that new participants lack information on GOOS-AFRICA history including initial plans and projects, Coordinating Committee mechanism, communication and interactions with stakeholders. The meeting requested the founding Coordinator and initiator of the GOOS-AFRICA Concept, Mr. Justin AHANHANZO to prepare a presentation for the following day. Subsequent, he convened an evening meeting of the GOOS-AFRICA Coordinating Committee member present at the meeting to co-design the content of the targeted presentation including refining of the GOOS-AFRICA Governance Structure for discussions.

1.3.4 Proposed Governance structure of GOOS AFRICA

For GOOS-AFRICA to effectively act as the platform for coordination of ocean matters on the continent, a refined governance structure that strengthens networking, efficiency, accountability, and cooperation mechanisms working with institutional nodes at regional or national level was adopted.

Based on the presentation on the history of GOOS-AFRICA and taking into consideration the need to reinforce and equip the Coordinating Committee and Working Groups with institutional memories, transfer of knowledge and best practices to close communication gaps and engage proactive vigorous multilateral and multisource fund raising, enabling regular activities, it was agreed to build on the expertise, experience and wisdom of the past Chairs of the GOOS-AFRICA Coordinating Committee. Consequently, a proposal was made to constitute a GOOS-AFRICA Advisory Board to be made up of past Chairs of GOOS-AFRICA Coordinating Committee, past leaders of LME projects in Africa and heads of major relevant African institutions. The Advisory Board will be an overarching paramount body to oversee and guide the GOOS-AFRICA Coordinating Committee and the upcoming Secretariat.

This architecture was presented and endorsed at the workshop.

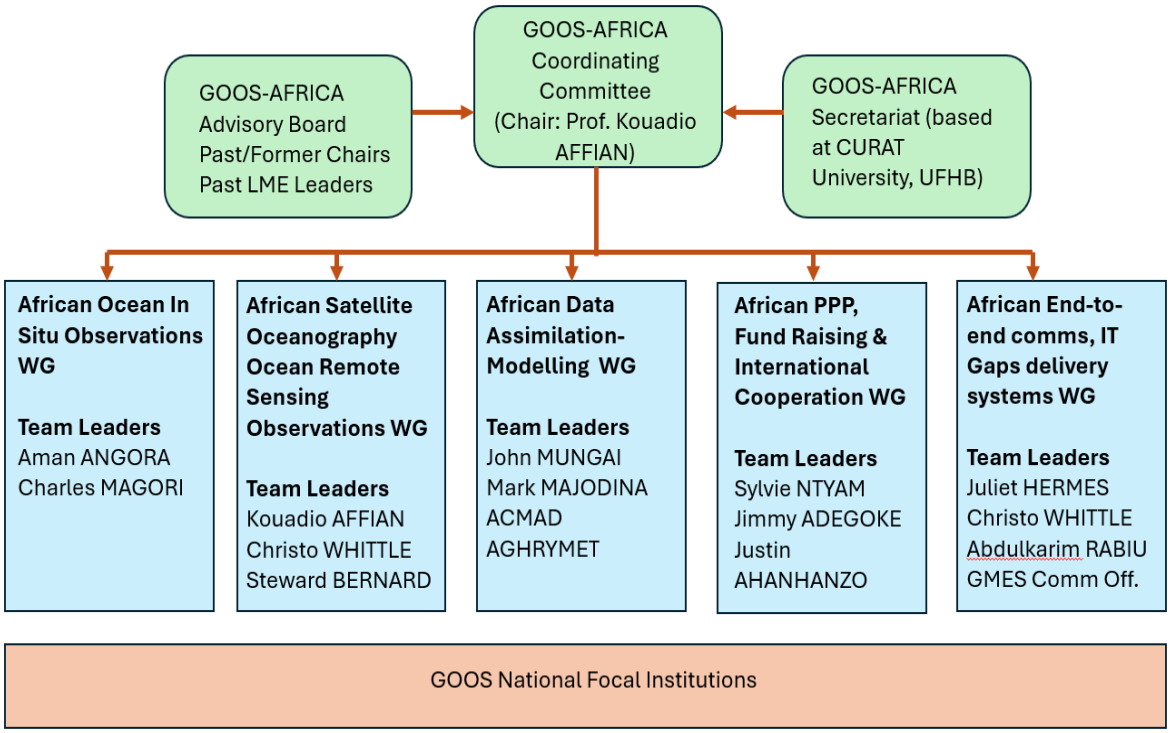

Figure 1:Revised Governance Structure for GOOS AFRICA

1.3.5 GOOS-AFRICA Draft strategic plan (to be improved)

A draft of the strategic plan over 3 years were proposed (see annex)

2- OCEAN OBSERVATION ACTIVITIES ACROSS AFRICA

Ongoing or/and planned ocean observations in major Large Marine Ecosystems (LME) in Africa include the following:

2.1 GCLME

The Guinea Current Large Marine Ecosystem (GCLME) region is the focus of multiple ongoing ocean observation initiatives aimed at understanding and preserving its complex marine environment. Key activities include:

a. Guinea Current Large Marine Ecosystem Project (GCLME): This collaborative effort among 16 West and Central African countries focuses on reversing coastal and marine environmental degradation. The project emphasizes ecosystem-based management to recover depleted fish stocks, restore degraded habitats, and reduce land- and sea-based pollution.

b. Building Capacity in Ocean Acidification Monitoring in the Gulf of Guinea (BIOTTA): Launched in 2024, BIOTTA aims to develop a coordinated network for observing ocean acidification in the Gulf of Guinea. The project focuses on training scientists in setting up and maintaining observation systems, contributing to global efforts like the Global Ocean Acidification Observing Network (GOA-ON). It also seeks to map ocean acidification hotspots for long-term monitoring.

c. Gulf of Guinea Ocean Sciences Summer School (GGOSSS): Scheduled to commence in August 2025, GGOSSS is an annual summer school dedicated to oceanographic and environmental studies for students and early-career scientists from French-speaking countries in the Gulf of Guinea. The program aims to enhance scientific knowledge in oceanography and foster collaborative networks among participants.

D. Argo Program: The international Argo program maintains a global array of profiling floats that collect real-time data on ocean temperature, salinity, and currents. The data are freely available and support climate and oceanographic research, including studies relevant to the GCLME region.

These initiatives collectively contribute to a comprehensive understanding of the GCLME, supporting sustainable management and conservation of its vital marine resources.

2.2 CANARY CURRENT LME

A notable effort is the seasonal glider program coordinated by the Oceanic Platform of the Canary Islands (PLOCAN), in collaboration with the Spanish Institute of Oceanography (IEO) and the University of Las Palmas de Gran Canaria (ULPGC). This program utilizes autonomous underwater gliders to collect data on various biogeochemical parameters, including temperature, conductivity, dissolved oxygen, chlorophyll, and turbidity. These gliders perform systematic dives, reaching depths of up to 1,000 meters, and contribute significantly to the continuity of time series observations at the ESTOC (European Station for Time-Series in the Ocean Canary Islands) and the RAPROCAN (Radial of the Canary Islands) stations including the Moroccan coast.

a. Satellite Remote Sensing

- **Agencies**: ESA (Copernicus), NOAA, NASA.
- **Observations Include**:
  - Sea surface temperature (SST).
  - Chlorophyll-a concentration (indicator of phytoplankton).
  - Ocean color and surface currents.
  - Coastal erosion and sea-level rise tracking.

b. In-situ Observations

- **Buoys & Moorings**:
  - Mooring arrays and drifting buoys deployed by institutes like IFREMER (France), IMROP (Mauritania), INRH (Morocco) and IEO (Spain).
  - Part of **GOOS** (Global Ocean Observing System) and **OceanSITES** networks.
  - Buoy Melax, coloration between LPAO/UCAD and IRD (au large de Mbour (Senegal)) from 2015 to present to monitor water quality (temperature, salinity, oxygen, acidity, chlorophyll) and ocean current in the first 30m
  - Water quality observation using multiparameter sensor profiler (temperature, salinity, oxygen, acidity, chlorophyll) along the Senegalese continental shelf. These observations are conducted by LPAO/UCAD, University of Thies, IRD, LOCEAN (Paris) LOPS (Brest)
  - CO_2 observation since 2025
  - In-situ observations (water quality, current, water level, tide) are also made in Senegalese estuaries (sine-saloum (UCAD, UAM,), Casamance (university of ziguinchor, UAM, UCAD, UIDT)…)
  - Topobathymetry observations are also made in the delta du Saloum for the shoreline monitoring
- **ARGO Floats**:
  - Deployed throughout the Atlantic, including the Canary Current, to measure temperature and salinity profiles.
- **Research Cruises**:
  - Regular expeditions for sampling water columns, plankton, fisheries stock assessment, and sediment cores.
  - Often coordinated by regional marine research institutions.

c. Fisheries Monitoring

- **Institutes**: CRODT (Senegal), IMROP (Mauritania), INRH (Morocco).
- **Activities**:
  - Acoustic surveys of pelagic fish like sardines, mackerel, and sardinella.
  - Monitoring small-scale artisanal fisheries using logbooks and GPS tracking.
  - Socio-economic assessments of fishing communities.
  - Oceanographic surveys

d. Marine Spatial Planning

- Marine Spatial Planning activities in several african countries including Morocco.

2.3 Mediterranean sea

The countries, namely Egypt, Libya, Tunisia, Algeria, and Morocco are actively engaged in various ocean observation initiatives to monitor and protect their marine environment. Notable activities include:

1. ODYSSEA Project Participation: The ODYSSEA project, funded by the EU Horizon 2020 program, aims to develop an interoperable platform integrating observing and forecasting systems across the Mediterranean basin. This initiative involves 28 partners from 14 countries, including five North African nations. The project focuses on enhancing data accessibility and operational services for end-users in the region

2. Engagement with the Mediterranean Science Commission (CIESM): North African countries collaborate with CIESM, which specializes in multilateral marine research in the Mediterranean Sea. CIESM facilitates rapid detection of environmental changes and provides authoritative advice on marine ecosystem issues through workshops, reports, and congresses.

3. Contributions to Coastal Sea Level Monitoring: African nations contribute to the network of 240 operational tide gauge stations monitoring sea levels in the Mediterranean and Black Seas. These stations provide essential data on sea level variations, aiding in the assessment of climate change impacts and informing coastal management strategies.

4. Initiative WestMED: The WestMED Initiative is supported by the European Commission, as a follow up to the UfM Ministerial Declaration in 2015, to help achieve a safer and more secure maritime space, create a smarter and more resilient Blue Economy and improve the maritime governance for the western Mediterranean.

2.4 Benguela current

The Benguela Current region, spanning the coasts of Angola, Namibia, and South Africa, is the focus of several ocean observation and governance initiatives aimed at ensuring the sustainable management of its rich marine resources. Key activities include: Frontiers

Benguela Current Convention (BCC): Established by Angola, Namibia, and South Africa, the BCC is a multi-sectoral intergovernmental organization dedicated to the long-term conservation, protection, and sustainable use of the Benguela Current Large Marine Ecosystem (BCLME).

Marine Spatial Management and Governance Programme (MARISMA): Supported by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), MARISMA promotes sustainable ocean use in the Benguela Current region through the implementation of Marine Spatial Planning (MSP). This process guides when and where human activities occur in the ocean, integrating conservation objectives with economic development.

2.5 Ocean Observations in the Indian ocean on the Eastern Coast of Africa.

African nations, including small island states, are actively engaged in various ocean observation initiatives in the Indian Ocean. Key activities include:

2.5.1. Indian Ocean GOOS (IOGOOS) and Indian Ocean Observing System (IndOOS) are collaborative networks providing sustained, high-quality oceanographic and marine meteorological measurements to support scientific understanding and environmental assessments. African countries contribute to and benefit from both networks and platforms , enhancing regional capacity for long-term monitoring and forecasting.

2.5.2. South West Indian Ocean Fisheries Project (SWIOFP): This initiative aims to identify and study exploitable offshore fish stocks within the South West Indian Ocean. Participating

countries include Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and Tanzania. The project focuses on sustainable fisheries management and regional collaboration.

5. Coastal Surveillance Initiatives: To enhance maritime security and environmental monitoring, coastal surveillance systems have been established in collaboration with regional partners. These systems assist in vessel traffic management, harbor surveillance, and navigation safety.

These initiatives demonstrate the commitment of African nations and small island states to collaboratively enhance ocean observation, promote sustainable resource management, and ensure maritime security in the Indian Ocean region.

3- INTERNATIONAL COLLABORATION

4-

1- OPERA

The overall goal of OPERA coordinated by MERCATOR is to strengthen capabilities and cooperation in ocean forecasting in Africa. The project serves to:

- establish a coordinated and dynamic community of ocean forecasting in Africa linked to the global ocean forecasting community for sharing of information, capacities, innovations, and opportunities
- carry out capacity development and technology sharing activities targeting a broad range of stakeholders in Africa to access, use, and tailor existing ocean forecasting services and tools.
- establish three consortia of up to five African partners each to co-design, co-develop, and deliver fit-for-purpose and coordinated Ocean forecasting systems, services and applications to meet African needs. One consortium will focus on developing regional and coastal ocean forecasting systems, and the two remaining consortia will focus on developing applications integrating ocean forecasting.
- strengthen uptake and use of the action's deliverables through stakeholder engagement activities, development of knowledge tools, and outreach activities, targeting African policy- and decision makers.
- create a roadmap to establish the foundation and build the "forecasting component" of the Africa Ocean Knowledge Hub outlined in the Ocean Decade Africa Roadmap.

OPERA will build on and complement existing regional mandates and networks covered by other programmes such as the GMES and Africa programme, and will work closely with regional bodies including GOOS-AFRICA, the IOC Sub Commission for Africa and the Adjacent Island States, the African Ocean Decade Taskforce, the Ocean Prediction DCC's

African regional team, UNEP African Sea Conventions, among other key partners to guide the project's activities and ensure its uptake and sustainability.

OPERA Kick off meeting, SAON Offices, Cape Town, South Africa, 8 – 10 April 2025

The South African Environmental Observation Network (SAEON) Egagasini node hosted the kick off meeting of the OPERA project from the 8th to the 10th April 2025 at its premisses in Cape Town. GOOS-AFRICA Coordinating Committee members and participating institutions attended the meeting. The Founding Coordinator of GOOS-AFRICA presented a paper entitled: "**The Global Ocean Observing Systems in Africa (GOOS-AFRICA) as the Pioneering Framework for Ocean Forecasting and Predictions in Africa".** This presentation was well received as it shed light into the original plans with ongoing efforts in Africa in the context of ocean predictions.

2- MoNITOR cooperation with the second oceanographic institute of China

- The MoNITOR was endorsed as a project in June 2022.
- This initiative, aims to:
- establish a high-resolution physical-ecological coupled operational numerical forecasting system for the ecological environment through:

multi-scale research and multi-disciplinary data and information cooperation

- investigations. The project has received great achievements with a joint effort among
- global partners and stakeholders. To further facilitate the increasing demand of
- global needs to executive MoNITOR and foster the communication under the global
- scope, it is proposed to upgrade as a programme for continously providing a
- scientific basis for the protection and sustainable use of marine resources and
- promoting the sustainable development of the marine ecological environment.

Many capacity building actions towards Africa were taken:

1. International Training on Marine and Coastal Ecological Environment and Disasters Monitoring in Small Island Developing States (SIDS)
June 1-15, 2024 at Hangzhou
A total of 25 participants from SIDS with 8 from Africa.

2. International Training Course on Principles and Applications of BGC-Argo
Nov 15-20, 2023 at Hangzhou
A total of 20 participants from global south with 10 from Africa.

3. International Training course on Ocean Color Remote Sensing and Three-Dimensional Monitoring Technologies (SatCO2-V)
Jul 18-26, 2023 at Hangzhou
A total of 18 participants from developing countries with 13 from Africa.

3. **Cooperation with the First Institute of Oceanography of China.** Through this cooperation, a link has been added to the IOCAFRICA website, allowing **users** to view predictions of temperature, salinity, currents, etc., for each African country.

4. TRAINNING ACTIVITIES

Training course at CURAT (Université Félix Houphouet-Boigny December 05 to 09, 2022

A training workshop on remote sensing was held at CURAT (Félix Houphouët-Boigny University) from. December 05 to 09, 2022 This workshop brought together students from eight countries, including Ghana, Mauritania, and Nigeria

Recommendation: adoption of the secretariat of GOOS AFRICA at CURAT (Université Félix Houphouet Boigny .

The GOOS-AFRICA Secretariat:

The meeting, stakeholders and the African Union accepted with gratitude the generous offer of the Government of Côte d'Ivoire, which established the Secretariat of GOOS-AFRICA in the campus of the largest University of the country, the University Félix HOUPHOUET-BOIGNY in the premises of the Remote Sensing Centre for Applied Research

Annex

Table 1. Matrix filled at the Workshop on Necessary Actions for the Strategic Plan

Activity	Task description	Start date	End date	Year of implementation	Requirements	Responsible	Deliverable	Budget
Strategic / Implementation plan	Recruitment of Consultant	May-24	Jun-24	Year 1 (2024-25)	Drafting of ToR by GOOS Coordination Committee; Administrative formalities for recruitment	GOOS-AFRICA Chair	ToR	
	GOOS AFRICA Secretariat Office set up	May-24	Jun-24	Year 1 (2024-25)	Space at CURAT identified and administrative formalities	GOOS-AFRICA Chair	Operational Office	
	Drafting of the Strategic and Implementation plan, prioritization of actions based on low hanging fruits	Jul-24	May-25	Year 1 (2024-25)	Consultant recruited and consultation with GOOS Coordinating Committee	GOOS-AFRICA Chair	Document	
	Co-implementation of GOOS AFRICA actions with those of SEAWARD AFRICA Umbrella Programme	Jun-24		Year 1 (2024-25)		IOC AFRICA Secretariat / GOOS-AFRICA working group		Regular budget
Infrastructure and Human	Mapping exercise by 1 expert per LME for data collection, (i.e., platforms, equipment, data centres, personnel, training	Jul-24	Jan-25	Year 1 (2024-25)		Prof. AMAN as Team leader to coordinate and synthesize the	Final Report	Regular budget

Resource mapping	opportunities) in consultation with the GOOS Coordinating Committee through the GOOS National Focal points, IOC focal point and GMES & Africa relevant survey					information into a final report		
	Targetted upgrade of existing facilities and infrastructure (in-situ) to address research gaps identified from EO and modelling concerns, and to replace outdated infrastructure.	May-25	Dec-26	Years 2 and 3	Prof. AMANs report for information			Norad funding
Role of GOOS Africa in Capacity developm ent	Coordination of training needs with those of GMES & Africa for synergies Coordination of GOOS Africa activities with Regional Centres of Excellence in RS (eg CURAT, Zanzibar, Nansen-Tutu etc) Support the utilisation of capacity development tools provided by Ocean Prediction DCC and	Nov-24	Dec-24	Year 1 for low hanging fruits and continuous to Year 3	Activity is captured in the submission made by GOOS AFRICA to IOC Assembly that clearly identified three institutions for Capacity Development; CURAT for Remote Sensing; Alexandria for in-situ monitoring and Morocco for Modelling	Prof. AFFIAN for CURAT Prof. HAMOUNDA for Alexandria Prof. KARIM for Morocco		Regular budget

	ETOOFS for Modelling / Prediction Take advantage of CD activities of Copernicus (hackathons)				Concept notes available and can be extended to Southern and Eastern Africa through submission of concept note			
	Training workshop on remote sensing marine applications	09 Dec 24	14 Dec	Year 1 (2024-25)	Drafting of ToR by CURAT	Director of CURAT	ToR	Regular budget
	Training workshop on Modelling, Observations and forecasting	First quarter	First quarter	Year 2 (2024-25)	Drafting of ToR by INRH	Director of INRH	ToR	Regular budget
	Training workshop on data acquisition, data processing, interpretation and data archiving	Second quarter	Second quarter	Year 2	Drafting of ToR by NIOF	President of NIOF	TOR	Regular budget
Data Quality and Technology Integration	In partnership with GAIA, perform validation exercise of low cost sensors using recognized oceanographic instrumentation as an investment in homegrown affordable new in situ ocean observation technology and systems.			Year 1	Purchase of Wave Buoy for West Africa Deployment of wave Buoy in Kenya purchased through GMES & Africa Phase I to strengthen the network of	Dr. AGYEKUM of UG Dr. MBARU of KMFRI	Deployed Wave Buoys	GMES & Africa MarCOSIO and MARCONoWA

					observing buoys in Eastern Africa region			
	Identify and acquire advanced technology and equipment to support data collection (e.g. COLaB, Smart Buoy from China, shelf scale sampling in SA taking advantage of existing partner technologies and 'fit for purposeness' in African conditions Recommend instruments for EOV measurements – provide best practices for EOVs in an African context	Dec 24	End of second quarter	Years 1 and 2	Donation of 10 Smart Buoy from China	GOOS-AFRICA Chair	First Institute of Oceanography of China	Regular budget
	Installing more tide gauges and maintenance the old ones	Dec 24	End of second quarter	Years 1 and 2	Drafting TOR	GOOS-AFRICA chair and expert committed for the implementation	TOR	Regular Budget

Ocean literacy, Outreach and Community Engagement	Develop a GOOS Africa website and brand identity and social media platform utilize GRA and GOOS communication staff. Explore a GOOS Africa newsletter into the future, utilizing partners eg through WIOMSA, with media, GMES and Africa to increase GOOS Africa awareness – eg engage with GOOS national focal points. Strengthen community engagement efforts through citizen science projects, public lectures, Civil Society Organizations, NGO's and Faith based organizations and outreach events to foster a sense of ownership and support for the institute's mission.			Years 1, 2 and 3	Leverage existing Ocean Literacy Programmes of UNESCO and outreach programmes and IOC AFRICA to assist to put together an Ocean Observation Expert group based on the African Group of Negotiation Experts		Newsletters	GMES & Africa MarCOSIO and MARCONoWA