



Report of
**WORKSHOP ON COLLABORATION BETWEEN GMES & Africa AND
GOOS AFRICA**

KIGALI, RWANDA

24TH – 28TH OCTOBER 2022



Workshop participants

Table of Contents

1. Introduction and Background.....	4
1.1. Objectives of the Workshop	5
1.2. Conduct of the Workshop	5
1.3. Opening addresses	6
2. GMES & Africa phase 2	6
3. Revamped GOOS AFRICA.....	7
3.1. Ocean Observations in Africa.....	8
3.1.1. North Africa	8
3.1.2. West Africa	9
3.1.3. South Africa	10
4. IOC Africa and the Ocean Decade.....	10
5. Proposed Roadmap: GMES & AFRICA and GOOS AFRICA collaboration.....	12
6. Conclusions and key messages	17
Annex 1: Concept note and Programme.	18
Annex 2: List of Participants.....	22
Annex 3: MarCoSIO activities across six pillars.....	27
Annex 4: UN Decade Action Hierarchy	28
Annex 5: Concept Note prepared by Prof. Juliet HERMES	29
Annex 6: Reactions to the Concept Note of Prof. Juliet	30
Annex 7: Presentation of FleetSAR by SIAS MOSTERT	31
Annex 8: Abbreviations & Acronyms.....	32

1. Introduction and Background

A workshop on a collaboration between GMES & Africa and GOOS Africa was organised during the 13th African Association of Remote Sensing of the Environment (AARSE) conference held in Kigali, Rwanda from 24th to 28th October 2022. The Conference brought together many experts including space technology specialists from Africa and the world. GMES & AFRICA and GOOS AFRICA have been identified as two initiatives that could work together in a strategic partnership for the implementation of the United Nations Decade of Ocean Science for Sustainable Development (2021-2030) in Africa.

The Ocean Decade Africa Roadmap¹ prepared under the guidance of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, is the blueprint for implementation of the Ocean Decade in the Africa. It has been prepared through a consultative process and based on a regional gap analysis undertaken through the joint facilitation of the IOC Sub Commission for Africa & the Adjacent Island States (IOCAFRICA), and the Western Indian ocean Marine Science Association (WIOMSA). The Roadmap identifies the following nine priority Decade actions for Africa:

1. Sustainable Ocean Management in Africa.
2. Ocean and Human Health in Africa.
3. Unlocking the Blue Carbon potential of Africa.
4. Fisheries and Illegal, Unreported and Unregulated (IUU) fishing in Africa.
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).
9. Regional ocean literacy programme.

The ocean observations and forecasting systems action is expected to strengthen the Africa components of the ocean observations network as part of the overall development of the Global Ocean Observing System (GOOS).

Two GMES & Africa Marine and Coastal areas consortia commenced the implementation of their three year projects in January 2022 consolidating the gains made during the first phase that ended in December 2021. GMES & Africa has a strong thrust on technological approach of utilizing Earth Observation (EO) backed by the Copernicus programme for service development. In-situ measurements (sensor networks, buoys and anchorages) do complement the EO observations and can benefit GMES & Africa Marine Consortia by enriching forecasting capabilities of the developed GMES & Africa Marine services.

Strategically therefore, GMES & Africa and GOOS AFRICA intend to work together in a partnership to support the Ocean Decade implementation in Africa.

¹ UNESCO-IOC (2022). *The United Nations Decade of Ocean Science for Sustainable Development 2021–2030. Ocean Decade Africa Roadmap. UNESCO, Paris. (The Ocean Decade Series 36)*

As outlined in the workshop concept paper², the strategic alliance should have objectives including the following:

1. Strengthen partnerships to improve the delivery of observations to end-users through scientific forecasts, services and assessments;
2. Maintain, strengthen and expand the coordination of observations through the GOOS AFRICA network;
3. Ensure that ocean observing data and information in Africa are accessible, interoperable and reusable with quality assurance;
4. Play a leading role in establishing effective governance for in situ and satellite observations in Africa, in collaboration with partners and stakeholders.

1.1. Objectives of the Workshop

The objective of the GMES & Africa and GOOS AFRICA workshop was to review in situ ocean observations initiatives, programmes and actions in Africa and to highlight the complementarity of GMES & Africa and GOOS AFRICA in this regard. The workshop provided an opportunity to initiate a joint programme the specific objectives of which include the following:

1. To survey in situ ocean observation programmes at regional and national scales;
2. To identify the stakeholders and their needs;
3. To review the services available to users;
4. To review Africa's strategies for effective participation in the UN Decade of Ocean Sciences for Sustainable Development;
5. To support a joint programme; and
6. To establish a partnership between GMES & Africa and GOOS AFRICA for a better use of the services generated from ocean observations by the end-users.

1.2. Conduct of the Workshop

The workshop started on the second day of the AARSE Conference (25th October) and continued for the next two consecutive days ending on the 27th October 2022.

Thirty one participants attended the workshop in person during all or part of the three days with additional four virtual attendees³. The three days were interactive and participatory.

Nineteen presentations were made during the first two days of the workshop; in-person (15) and virtual (4) with flexibility in the programme.

Round table deliberations involving the entire group were held during the final day that resulted in a matrix that will constitute the basis (including timeline and budget) for GMES & Africa – GOOS AFRICA future engagement.

Prof. Kouadio AFFIAN, the Chairman of GOOS Africa Coordinating Committee, chaired the workshop and Mr. David KIRUGARA, a key Marine and Coastal Areas expert in the GMES & Africa Phase 1, served as the rapporteur.

² Annex 1: Concept note and Programme

³ Annex 2: List of participants

1.3. Opening addresses

In his opening remarks, Prof. Kouadio AFFIAN reiterated the need for strengthened collaboration within the continent of Africa so as to realize the full implementation of the Ocean Decade for Africa, and confirmed the commitment of GOOS AFRICA to play its role. He concluded by stressing the importance of GOOS AFRICA network in operational oceanography on the continent.

Dr. Tidiane OUATTARA, the Space Expert and GMES & Africa Program Coordinator at the African Union Commission urged GOOS AFRICA to advise GMES & Africa on a development tool for Oceans in Africa to support African Agenda 2063. He shared with participants his vision of all African Ocean experts working together with activities aligned with others for sustainability in the Pan Africanism spirit. He ended his remarks by challenging the participants to come up with a draft roadmap for 2022 – 2025 at the end of the workshop to be officially delivered to the AUC so that GOOS AFRICA can claim full ownership. AUC will then commit to offering all the political support for implementation of the roadmap.

2. GMES & Africa phase 2

Dr. Tidiane OUATTARA informed the participants that in the second phase, GMES & Africa is supporting two consortia with more than 4 million Euros for service development across the entire continent, including the North Africa region. Additional support could be mobilized for coordination actions related to revamping GOOS AFRICA activities. Of the six pillars of the second phase, Policy and institutional Frameworks and Knowledge Management and Cross Fertilization could be of mutual strategic interest for GMES & Africa and GOOS AFRICA for increased impact by both.

In his presentation, Mr. David KIRUGARA, former Key expert, Marine and Coastal Areas for GMES & Africa Phase 1 gave an overview of the GMES & Africa Marine Projects in the first phase and stressed that philosophy of GMES & Africa is an operational programme geared towards service development and delivery based on identified end user needs. GMES & Africa is expected to develop these services and the second phase is looking to consolidate them.

Dr. Christo WHITTLE, representing the MaRCoSIO consortium informed the participants that the project involves 12 partners from 8 countries, namely; South Africa (with CSIR as the lead agency), Angola, Namibia, Mozambique, Tanzania, Kenya and the island states of Madagascar and Mauritius. He demonstrated how the service development within their consortia links with the pillars⁴ mentioned earlier by Dr. OUATTARA and that GMES & Africa cannot work outside their pillars. This demonstration was later to give clear guidelines and chart the way for deliberations bearing in mind the limitations of the GMES & Africa Programme. He proposed that GOOS AFRICA could focus on in-situ oceanographic observation for validation to support the earth observations (EO) by GMES & Africa with targeted intense in-situ campaigns to areas less studied in addition to networking opportunities.

⁴ Annex 3: MarCoSIO activities across six pillars.

Dr. Kwame Adu AGYEKUM, the Coordinator of MarCNoWA Consortium in North and West Africa, gave an elaborate presentation of the services that they are providing in their region of interest, building on the successes of the previous phase and extending to North Africa. The consortia includes 6 countries from North Africa - Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia, and 12 countries from West Africa - Benin, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone and Togo. He noted that MarCNoWA is providing services in location of Potential Fishing Zones (PFZ) and vessel traffic, Coastal Vulnerability, regional marine weather forecast, and Oil spill monitoring.

On in-situ measurements, he informed the workshop of the innovative technologies for coastal in-situ measurements from small boats being piloted called C-Argo, and noted that GOOS AFRICA can help in this area. Buoys to measure marine weather is another area that GOOS AFRICA can help with. He concluded his presentation by advising for better agreement for data sharing and strengthening the use of IOC of UNESCO's OceanTeacher Global Academy for Capacity development in the Continent.

Dr. Andre from the Joint Research Centre (JRC) of the European Commission gave a presentation on the processing tool for satellite data (the e-station) and applications for marine and coastal areas. The e-station, a processing server for environmental data processing, offers the GMES & Africa consortia less processing time for analysis to develop service for the end-users, particularly when linked to EUMETCast dissemination of primary data. Three e-station versions exist; - the physical station, the windows stand alone and currently an online version that is available for all.

3. Revamped GOOS AFRICA

Mr. Justin AHANHANZO of IOC of UNESCO gave a historical perspective of GOOS AFRICA and highlighted that one of the challenges of the programme is the issue of sustainability after two decades. He was optimistic that GOOS AFRICA and GMES synergies can and should promote Ocean Observation and Services in Africa provided that actors show the necessary dedication, devotion and commitment to the Continent. In his coined phrase "*UBUNTU Cross fertilization*" he advocated for joint IOC AFRICA, GOOS AFRICA and GMES & Africa actions to create an enabling condition for successful implementations of Continental Marine and Coast Development Ocean development Platform. He made reference to Mercator Ocean International that started from humble beginnings and currently is a global International Organization working with the European Centre for Medium-Range Weather Forecasts (ECMWF) and the European Meteorological Satellites exploitation organisation (EUMETSAT).

Dr. Emma HESLOP, Programme Specialist for the GOOS Project Office reminded the participants that GOOS is indeed the infrastructure that coordinates the global observing systems of thirteen (13) global networks involving eighty four (84) countries and fifty seven (57) GOOS National Focal Point (NFP) committees. The in-situ networks include Ship-based observations, sea level gauges, moored and drifting buoys, profiling floats (Argo), high frequency (HF) Radar to Ocean gliders all contributing towards operational services, Climate and Ocean Health. She continued to highlight the GOOS 2030 Strategic Goals, a new

and exciting umbrella programme that GOOS AFRICA can plug in as GOOS seeks to address the challenges in expanding observations and enhancing fit for purpose three transformational programmes Co-design, Coastal Predict and Observing together.

Prof. Aldo's presentation was an example of Co-design project (Share Med) delivered by SHAMMARI. The project proposal is about Sharing and enhancing capabilities to address environmental threats in the Mediterranean Sea and involves a huge consortium. It is proposed that this will be achieved by enhanced observation capabilities, sharing knowledge, data, and technologies and linking networks. Under Share Med umbrella, there is a governance system for coordination, planning and direction working together with institutional nodes at regional or national level with capitalization on what has been done in the past

3.1.Ocean Observations in Africa

Eight presentations on ocean observations in Africa were delivered during the workshop; these covered the North Africa (3), West Africa (4) and South Africa (1) regions.

3.1.1.North Africa

Dr. Inal AHMED, a researcher from the National Centre for Research and Development of Fisheries and Aquaculture (CNRDPA) delivered a presentation of Ocean Observation in Algeria. The Institution performs fisheries and aquaculture assessment surveys to answer to their national priorities and / or regional priorities and are conducted onboard RV *Belkacem Grine* in addition to observations from moored and floating oceanographic equipment. Other observations done include mapping of the seabed and bathymetry surveys. The consultative meetings between all stakeholders for the design of a National Oceanographic Data Centres is complete and installation will commence soon.

Dr. Karim HILMI delivered a presentation of Ocean Observation from Morocco in connection to GOOS AFRICA. The scientific presentation highlighted the influence of Climate Change on the the Canary system and thus the need for Ocean Observation and Monitoring and requirement for an integrated national strategic approach. He mentioned that different oceanographic platforms are used for observation, mainly in the bays and lagoons and Morocco is adopting new technologies, including Argo float and Glider development, for monitoring marine life and pollutants. The involvement with Mercator Ocean International offers an opportunity for access to 9 days forecast of for SST, SSH, currents, etc.

Prof. Cherif SAMMARI delivered a presentation on Ocean Observation from Tunisia in connection to GOOS AFRICA. He told the participants that unlike the Southern Mediterranean Basin is least studied due to lack of modelling skills among other challenges. The scientific presentation was based on Observations that have been made during several years using different instrumentation including drifters and ferrybox, and including simulations of how climate change impacts regional sea level, marine ecosystems and maritime transport and fisheries. Such studies have been conducted from Oceanographic cruises

onboard RV *Hannibal*. He summarized his presentation by calling for sharing of information and creation of common platforms.

3.1.2. West Africa

Dr. Frederic BONOU delivered his presentation of Ocean Observation from Benin in connection to GOOS AFRICA virtually. He informed the participants that coastal erosion is a huge challenge in the West Africa region in general and that a regional approach has been undertaken to develop a decision making support system to tackle the accretion -erosion dynamics among neighbouring countries. There exists a reliable regional multivariable monitoring network involving Benin, Ghana, Cote Ivoire and Senegal using similar equipment (video camera) and infrastructure to study beach morphology. The cameras, installed in 2013, record and process hydro-morphological data every fifteen (15) minutes, including for bathymetry, tides and other oceanographic parameters. The data clearly show sediment transport dynamics in the region and shoreline change in the last four (4) years. Sea level measurements are also taken from tide gauges and show strong correlation with satellite altimetry data.

Prof. Aman ANGORA delivered an elaborate presentation on past observations in the Guinea Current Large Marine Ecosystem (GCLME), West Africa. He informed the workshop that ocean swell variability and trends of annual significant wave heights along the Northern Coast of the Gulf of Guinea and a vulnerability map of Gulf of Guinea coastal area induced by physical forcing have been published⁵. He noted, however, that there is a lack of updated studies on the influence of extreme climatic events such as storm surges, extreme winds, sea level rise, erosion and coastal flooding in the region.

He lamented that despite continuous sea level measurements taken at a global scale, significant data gap has been recorded along the West Africa coast. He noted that the only long historical tidal record is from Takoradi, Ghana (1929 – 1986), disrupted until 2004 – 2005, and available from 2007 to present. Only Tide gauge stations in Ghana (in Takoradi), Guinea and Nigeria are operational within the Gulf of Guinea.

Several equipment for ocean observations exist along the West African coast but are sparse and generally provided through regional or international programs with limited lifetime. Examples are the PROPAO operational network of coastal SST autonomous sensors in the north of the Gulf of Guinea and the Prediction and Research Moored Array in the Tropical Atlantic (PIRATA) network.

Prof Angora proposed improving and maintaining ocean observation in West Africa, particularly in-situ measurements for long term climate variability at regional scale and to support pollution studies. He proposed standardization of equipment, data analysis, calibration and training to ensure the creation of a common and regionally harmonized platform for sharing information.

Dr. Nubi AYoola delivered his presentation of Ocean Observation from Nigeria in connection with GOOS AFRICA. He gave an overview of activities at the Nigeria Institute of Oceanography and Marine Research (NIOMR) and mentioned

⁵ Aman et al., 2019

the POGO intervention in 2020 for acquisition of oceanographic data for sustainable resource management in the Gulf of Guinea (GoG Project). He noted that this can contribute towards the UN Decade of Ocean Science if the objective of the programme is redefined. He called for the need for shared resources and collaborative research

Dr. Ibrahima CAMARA, from the Cheikh Anta Diop University delivered his presentation of Ocean Observation from Senegal in connection with GOOS AFRICA. Dr Camara noted that there is an array of equipment in Senegal for oceanographic observations and he mentioned the Melax Buoy deployed in 2015 at thirty (30) m depth to better understand the Senegelse upwelling system by measuring profiles of oceanographic parameters. He informed participants that Senegal uses different sensors, including Video camera, for monitoring shoreline change, wave parameters and bathymetry, similar to the one installed in Benin. They also plan to set up a wave measurement network under a project called ORLOA.

He also noted that Senegal is collaborating with many European partners like IRD and LOCEN of Paris and others to address research.

3.1.3.South Africa

Prof. Juliet HERMES, the Manager at South African Environmental Observation Network (SAEON) delivered her presentation on South Africa's Operational Initiative. She told the participants that modelling in South Africa is done through a combination of several institutions to address multiple challenges related to the EEZ agenda with Marine Spatial Planning (MSP) and Extreme Weather Events (EWE) in the Benguela Current Large Marine Ecosystem area. In South Africa, the Ocean Coastal Information Management System (OCIMS) focuses on HAB, Operations at Sea while Sustainable Ocean Modelling Initiative: South Africa (SOMISANA) is mandated for Regional Ocean modelling (ROMS). At SOMISANA, global models are optimally downscaled for their EEZ interests and forecast models are also optimally downscaled for the EEZ application in cooperation with the South African Weather Services (SAWS) for marine operational modelling. She emphasized that modelling adds value to satellite information, and capacity development in the field is critical. On Observations, she said that the coastal stations in South Africa have been observed for last 10 years through a temperature network, ARGO floats and drifts and other oceanographic equipment while offshore marine observations are managed through a mooring array in the South Atlantic Ocean.

4. IOC Africa and the Ocean Decade

Mr. Mika Odido, the IOC Africa Coordinator made a presentation on the UN Decade of Ocean Science for Sustainable Development and its implementation in Africa. He informed the participants of possible entry endorsement points for Decade Actions in Africa through call No. 04/2022 which ends on 31st January 2023 and based on the two priority (2) areas listed below.

1. Pillar 5. Strengthening multi-hazards early warning systems and community resilience:

This Action aims to close the gaps on observation data between sub-regions, develop tools for observing, forecasting, warning and anticipating

climatic hazards e.g. operational platform and decision support system to address tsunamis generated by different sources, e.g., seismic activity, volcanoes, landslides etc.

- Promote research on extreme events (extreme cyclones and swells, etc.) through the development of coupled sea-atmosphere modelling tools.
- Work with policy makers, local communities and disaster risk management authorities to influence policy and planning for community resilience.
- Capacity development and ocean literacy components to increase awareness and understanding of risks and response measures.

2. Pillar 7. Digital twin for Africa - Establishing an African Ocean Knowledge Hub :

This Action will establish and advance on the development of a regional 'digital twin' for Africa for centralizing marine data, modelling and simulations with artificial intelligence (AI) algorithms, specialized tools, and best practices.

He explained the avenues for participation in the call for Decade Actions either as decade programme, project, or activity and lamented that few Decade Actions led by institutions and organizations from Africa have been endorsed despite the Ocean Decade Africa Roadmap providing the framework for developing Decade Actions. He noted the endorsement of the FAO EAF-Nansen Programme as a Decade programme since the first call for actions.

Two entry points are possible, for non UN entities whose proposals have to be peer reviewed during the time limits of the call for action and / or for the UN entities that need to be submitted through the sub-regional committees. He advised that due to the bureaucratic engagement with UN system, it is prudent for calls by the GMES & Africa – GOOS AFRICA team to be submitted through the non-UN system channel to ensure that they are peer reviewed. More details on decade programme, decade project and decade activity are elaborated in this report⁶.

Dr Juliet HERMES, engaged by IOC of UNESCO and GOOS Africa to develop a concept note for the Ocean Decade for Africa, had the opportunity to share the prepared document⁷. The reactions to the concept note are summarized here⁸:

⁶ Annex 4: UN Decade Action Hierarchy

⁷ Annex 5: Concept Note prepared by Prof. Juliet HERMES

⁸ Reactions to presentation of Juliet

5. Proposed Roadmap: GMES & AFRICA and GOOS AFRICA collaboration

GMES & Africa is based on six pillars, namely;

- policy and institutional frameworks;
- data access;
- service development,
- knowledge management and cross fertilization;
- capacity development; and
- outreach, uptake and dissemination.

On the other hand, GOOS Africa exists to serve as a platform for coordination of transboundary observing networks and thus can play an important complementary role with GMES & Africa activities. Identified gaps that GOOS AFRICA can fill and contribute towards the success of GMES & Africa programme are elaborated below.

Governance and Coordination issues (linked to Policy and Institutional frameworks pillar of GMES & Africa)

- GOOS AFRICA to act as the platform for coordination of ocean matters on the continent, with a governance structure for strengthening networking, coordination and cooperation mechanisms working with institutional nodes at regional or national level. In this way, GOOS AFRICA could reinforce Agenda 2063 aspirations, the African Blue Economy strategy and other continental ocean-related policies, strategies and programmes by creating effective partnerships.

In-situ measurements competencies (linked to Data Access pillar of GMES & Africa)

- GOOS Africa can promote access to in-situ data through ocean observing networks for model calibration and validation. It was reported during the workshop that all African countries collect in-situ measurements in varying degrees and work with regional and international partners. GMES & Africa can then add value to earth observations by incorporating additional in-situ observations for development of better services to down stream users.

Technical and scientific assistance (linked to Services pillar of GMES & Africa)

- GOOS AFRICA can foster scientific and technical assistance by providing inventories of current status of continental ocean observations (platforms, equipment, personnel) and relevant African capacities, institutions, programmes and competencies to GMES & Africa partners and stakeholders.

Promoting Capacity Development (linked to Capacity Development pillar of GMES & Africa)

- GMES & Africa can leverage on existing platforms like Ocean Teacher developed by IOC of UNESCO and training centres infrastructure.
- GMES & Africa can also benefit from the development of training content and utilizing IOC of UNESCO trained resource persons and access regional

databases at the operational IODE nodes (hubs) for data exchange opportunities in Kenya, Benin and Madagascar.

With this background, the participants held consultative deliberations and identified high level activities that can be undertaken that are found in Table 1 below.

Table.1. Matrix filled at the Workshop on gaps and possible engagement of GOOS AFRICA to fill them

GMES & Africa Pillars	Gaps (Missing links)	GOOS Africa added value: Contributions/ solutions	Activity	Deliverable Timeline
Policy and institutional Frameworks	Science-policy Frameworks Science to policy and society. Coordination, Harmonization & Implementation of various policies: Mechanisms and Structures	Science Diplomacy, Continental African and international cooperation (African Regional institutions, AU, RECs) UN and non-UN specialized institutions (e.g. WMO, UNEP, FAO, etc.) and Science-Policy interface, linkage with other initiatives	Follow up relevant African strategies including for ocean governance (UNEP, AUC, etc)	Continental high level Policy Brief and Executive Seminars on critical topics to be delivered at relevant high profile Ministerial meetings (e.g. AMCEN, African Regional marine Conventions, etc). (Continuous)
Data Access	In situ oceanographic and meteorological observations New Ocean Observations Systems. Citizen Science Ships of opportunity Archives of historical time series Data policy (AUC policy)	Mapping the status of ocean observation networks in Africa (Platforms, etc.) Interoperability Satellite & Remote Sensing for marine products. Near real time in-situ observations to complement space data. Ensure effective engagement in Regional Fisheries Bodies.	Invest in homegrown affordable new in situ ocean observation technology and systems.	- Linkages between national and regional data centers, regional conventions - African geoportal Clearinghouse mechanism - Policy on data access and sharing marine biological and biodiversity data. Establishing a data policy framework that generates confidence within member-governments with respect to data security and data standards and sharing aligned with UN Decade relevant bodies in Africa. (Continuous)
Services	Ecosystems assessment	In situ oceanographic observations contributions to: - Fisheries and aquaculture	- Invest in African homegrown affordable new in-situ ocean observation technology and systems	-Updated Report on In situ oceanographic and

		- Coastal services - Maritime shipping	based on assessments of current African wide Ocean observations gaps.	meteorological observations around Africa (A. Angora, 2021). -Biannual report of Goos Africa <i>(June 2023)</i>
Knowledge Management & Cross fertilization	Inventory of relevant African capacities, institutions and competencies	GOOS-AFRICA is a unique Pan African Network of oceanographic and meteorological academic and research institutions and NGOs and maritime monitoring	Evaluation of societal impacts of marine plastic pollution and ocean acidification and illegal fishing on fisheries and aquaculture. Organizing a specific technical annual GOOS Africa workshops and joint marine and coastal services workshops	Reinforced network of oceanographic academic and research institutions Best practices shared <i>(Annual, 2023 to 2025)</i>
Capacity Development	Citizen Science On the job professional training University Curricula	- GOOS-AFRICA as a key member and catalyst with the Alliances of the Global Ocean Observing Systems and relevant international partners. GOOS-AFRICA Satellite Remote Sensing training experiences.	Network and use of existing African capacities and facilities to develop relevant and needed competencies and skills GOOS Africa members to provide (7-10) minutes video profile of research and professional activities Scientific mobility with particular focusing on students and earlier career professional researchers With mentorships	Video of profile of research and professional activities <i>(Continuous (2020 -2025)</i>
Outreach, Uptake and Dissemination	Awareness of African Government to ocean services	Communication to Policy Makers and Society	Continental high level Policy Brief and executive seminars on critical topics to be delivered at relevant high profile Ministerial meetings (AMCEN, African Regional marine Conventions, etc). Using GOOS Africa digital platforms including podcasts and social media	-GOOS Africa website developed with increased visibility -Reinforced communication, interactions and feedback with communities and society <i>(Continuous (2020 -2025)</i>

Activities, Deliverables and Workplan

Planned activities for 2023 are outlined in Table 2.

Table.2. Planned activities for 2023 with deliverables and budget

Activity	Deliverable	Timeline and Budget
AUC support in setting up of the GOOS AFRICA Secretariat in CURAT, Côte d'Ivoire including an executive committee	Operational secretariat	Jan – March 2023 \$\$\$\$?
AUC to 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	Continuous during 2023 \$\$\$\$\$
AUC to 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	June 2023 \$\$\$\$\$
AUC to 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 Ocean Development Fund for Africa	Report	May 2023 \$\$\$\$
AUC to support GOOS AFRICA in joint planning of two workshops with the Marine Consortia and other stakeholders	Workshop report	June 2023 November 2023 \$\$\$\$
AUC to 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	July 2023 \$\$\$\$\$

AUC to support GOOS-AFRICA in carrying out a workshop to prepare a programme or a project to be submitted to UN Decade of Ocean Science for Sustainable Development, building upon the concept note of Dr. Juliet	Workshop report	November 2023 \$\$\$\$
AUC to support GOOS AFRICA in Improving linkages with national institutions.	Progress reports	Continuous \$\$\$\$\$
AUC to 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	Continuous \$\$\$\$

6. Conclusions and key messages

The summary of the workshop is given below:

- 1) AUC can support GOOS AFRICA on actions that will help GMES & Africa to realize her objectives, mainly along the pillars of GMES. AUC can also support GOOS AFRICA to connect with other Departments at the Commission and in particular the Blue Economy Division
- 2) Another area of potential is within the Ocean Decade for Africa in which GOOS AFRICA and GMES & Africa can prepare for either programmes, projects or activities to align with the pertinent call, e.g. Ocean Adification and Marine pollution and other considerations under the call. Marine plastics and Ocean acidifications are pertinent Global challenges but cannot be supported under GMES & Africa but could be considered in the Ocean Decade proposal
- 3) Prof. AFFIAN and Dr. OUATTARA thanked the participants for a job well done and there was agreement on in-situ observations as a priority action and the need to expedite the establishment of the GOOS AFRICA secretariat at CURAT for formal communication and exchange with the African Union Commission.

Annex 1: Concept note and Programme.

Concept Note

Introduction

The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) was proclaimed “to support efforts to reverse the cycle of decline in ocean health and gather ocean stakeholders worldwide behind a common framework that will ensure ocean science can fully support countries in creating improved conditions for sustainable development of the Ocean” (UNESCO-IOC, 2022). The Ocean Decade is especially opportune for Africa as its coastal and ocean waters are increasingly gaining importance as a potential source of economic growth and employment. Several African countries are highly dependent on the ocean and its rich resources. The Ocean Decade Africa Roadmap provides a vision and plan for diverse stakeholders to convene around a common set of priorities for the implementation of the Ocean Decade in Africa.

The Global Monitoring for Environment and Security and Africa (GMES & Africa) initiative is *the crystallization of the longstanding cooperation between Africa and Europe in the area of space science & technology and earth observation*. The contribution of space observation to satellite communication, television, radio, positioning on the earth, as well as to fields such as agriculture, transport, health, natural resource management, the environment and risk forecasting is well established. Space observations are privileged tools for better understanding of the earth as well as the entire solar system. Although very powerful, space observation which leads to the creation of models, relies on *in situ* data and mainly data from the oceans, which are the driving force behind global changes and which make up about 70% of the surface of the earth. The marine environment is the largest component of the Earth’s system that stabilizes climate and support life on Earth and human well-being. GMES & Africa activities are designed to enable Africa to solve and address some global environmental challenges and to promote sustainable development.

A policy on collection of in situ ocean data is therefore essential, but unfortunately, to date, a common oceanographic data collection policy has not been adopted in Africa. The data collected at the level of each country for its own needs are often not only fragmentary but discontinuous. The GOOS-AFRICA alliance was established by the Intergovernmental Oceanographic Commission (IOC) of UNESCO with an objective of coordinating ocean observing systems and operational oceanography across African nations. Thus, GOOS Africa could play an essential role in supporting GMES & AFRICA.

Strategically, GOOS AFRICA and GMES & AFRICA should work together in a partnership in support of Ocean Decade implementation in Africa. The strategic alliance should have the following objectives:

- i. Strengthen partnerships to improve the delivery of observations to end-users through scientific forecasts, services and assessments;
- ii. Strengthen knowledge and exchange around the creation of value from ocean observations, enabling the dissemination of end-user applications at the local level;
- iii. Maintain, strengthen and expand the coordination of observations through the GOOS AFRICA network;
- iv. Promote standards and best practices;
- v. Ensure that ocean observing data and information in Africa are accessible, interoperable and reusable with quality assurance;
- vi. Support innovation in observation technologies and networks;
- vii. Develop capacity to ensure that a wider range of stakeholders participate and use the data for their benefit;
- viii. Expand systematic observations to understand human impacts on the ocean; and
- ix. Play a leading role in establishing effective governance for in situ and satellite observations in Africa, in collaboration with partners and stakeholders.

To achieve the above objectives, a workshop is being organised with an objective of formalising a win-win collaboration between GMES & AFRICA and GOOS AFRICA on in-situ ocean observation in Africa. The workshop is to be organised during the 13th African Association of Remote Sensing of the Environment (AARSE) conference which brings together many experts including space technology specialists from Africa and the world. The AARSE conference will take place in Kigali, Rwanda from 24 to 28 October 2022.

Objectives of the workshop

The general objective of the GMES & AFRICA and GOOS AFRICA workshop is to review in situ ocean observations initiatives, programmes and actions in Africa and to highlight the complementarity of GMES & AFRICA and GOOS AFRICA in this regards. The workshop will also provide an opportunity to initiate a joint programme the specific objectives of which include the following:

- i- To survey in situ ocean observation programmes at regional and national scales; ii- To identify the stakeholders and their needs;
- iii- To review the services available to users;
- iv- To review Africa's strategies for effective participation in the UN Decade of Ocean Sciences for Sustainable Development;
- v- To support a joint programme; and
- vi- To establish a partnership between GMES&AFRICA and GOOS AFRICA for a better use of the services generated from ocean observations by the end-users.

Provisional Agenda

24 October 2022	
Opening of AARSE conference	
Day 1: 25 October 2022	
9: 00 – 9:30	Registration
9:30 – 9:45	Welcome addresses by: a. Prof Kouadio AFFIAN, Chair of IOCAFRICA and Chair GOOS AFRICA Coordinating Committee b. Dr Tidiane OUATTARA, Coordinator of GMES & AFRICA
9:45-10:00	Dr Tidiane OUATTARA Overview of The GMES & AFRICA Programme (phase II)
10 :00-10 :30	Mme Ema Heslop: The GOOS Strategic Goals
10 :30-10 :50	Mr Justin AHANHANZO: History of GOOS AFRICA
10:50 - 11:20	Mika ODIDO: UN decade (African road map)
11 :20-11 :35	Coffee break
11 :35-11 :55	Dr HILMI Karim : Ocean observation in connection with GOOS AFRICA
11 :55- 12 :10	Dr Cherif SAMARI : Ocean observation Tunisia in connection with GOOS AFRICA
12 :10- 12 :30	Prof AMAN Angora: Past ocean observation in West Africa
12 :30-12 :50	M. Frédéric K. BONOU: Ocean observation in Benin in connection with GOOS AFRICA
12 :50-13 :10	Nubi Olubunmi Ayoola : Ocean observation in Nigeria in connection with GOOS AFRICA
13 :10 -14 :00	Lunch break
14 :00 – 14 :20	Inal Ahmed : Ocean observation in Algeria
14 :20-14 :40	Prof Aldo (on line): Example of co-design project (ShareMed)
14 :40-15 :00	Dr Suzan El Gabaroui: Ocean observation in Egypt in connection with GOOS AFRICA
15:00 – 15:20	Coffee break
15 :20-15 :40	Amadou Thierno GAYE: Ocean observation in Senegal in connection with GOOS AFRICA
15 :40-16 :00	Charles MAGORI (on line): Ocean observation in Kenya in connection with GOOS AFRICA
16 :00-16 :20	Dr Juliet HERMES: Ocean modelling in South Africa
16 :20-16 :40	Dr Vanessa Cardin : Ocean observation case of MONGOOS
16:00 – 16:30	Dr HILMI Karim : Mercator new initiatives
16:30 – 17:30	Discussions and summary for the day

Day 2: 26 October 2022	
09:00 – 10:30	Round table: Identification of actions to be undertaken in synergy with GMES & AFRICA
10 :30-11 :00	Co-designing of regional programme (2 groups)
11 :00-11 :30	Coffee break
11: 30-13 :00	Co-designing of regional programmes cont.
13 :00-14 :00	Lunch
14 :00-15 :00	Report back from task groups
15:00 – 15:30	Coffee break
15 :30-17 :00	Round Table: Improved networks and international collaboration for ocean observations in Africa
17:00 – 17:30	Discussions and summary for the day
Day 3: 27 October 2022	
9 :00-11 :00	Co-designing of regional programmes cont.
11 :00-11 :30	Coffee break
11:30 – 13:00	Group reports
13 :00-14 :00	Lunch
14 :00-15 :30	General discussions, conclusions and closing of workshop
15 :30-16 :00	Coffee break
	28 October 2022 Participation in AARSE conference

Annex 2: List of Participants

Title	NAME	INSTITUTION	EMAIL
Mr	ADIATOU Fatty	Communications Expert GMES & Africa Program Science and Technology Division Education, Science, Technology & Innovation (ESTI) African Union Commission Addis Ababa, ETHIOPIA	FattyA@africa-union.org
Prof.	AFFIAN Kouadio	Full Professor, Remote sensing applied to ocean specialist Vice-President of Universty Felix Houphouët-Boigny, Abidjan Chair of IOC AFRICA Chair of GOOS AFRICA Member of the UN Decade Advisory Board of Ocean Science for Sustainable Development Former Dean of the School of Earth Sciences, Cocody University Former Director of CURAT (Remote Sensing Centre for Applied Research) Abidjan, COTE D'IVOIRE M: +225 0141414040	K_affian@yahoo.fr
Dr.	AGYEKUM Kwame Adu	Coordinator MarCNoWA Consortia Marine and Coastal Areas Management in the North and West Africa GMES and Africa Programme Regional Marine Centre, University of Ghana GHANA M: +233 244 671 350	kaagyekum@ug.edu.gh https://gmes.rmc.africa https://regionalmarinecentreug.blogspot.com
Mr.	AHANHANZO Justin	IOC Regional Liaison Officer for Latin America and the Caribbean, Asia and the Pacific and Africa Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) UNESCO Headquarters, 7 Place de Fontenoy 75352 Paris Cedex 07 SP FRANCE M: +33 6 89 43 13 91	j.ahanhanzo@unesco.org URL: http://unesco.org http://ioc.unesco.org
Dr.	AHMED Inal	Centre National de Recherche et de Developpement de la Peche et d'aquaculture Ecosystemes Aquatiques ALGERIA M:	inal_ahmed@yahoo.fr
Dr.	AKUNGA Beatrice Ghattuba	Senior Fisheries Officer State Department for Fisheries, Aquaculture and the Blue Economy KENYA M: +254 713 811647	bghettuba@yahoo.com
Dr	ANDRE	Joint Research Centre	

		European Commission	
Prof	ANGORA Aman	Lecturer LAPA MF - Team Leader of Environment and Tropical Climate Sciences UFR SSMT - Felix Houphouet Boigny University of Cocody Abidjan, COTE D'IVOIRE ODINAFRICA Coordinator for Coastal Observing System M: +22507827752	angora.aman@gmail.com
Dr.	AYOOLA Nubi Olubunmi	Assistant Director, Physical & Chem. Oceanography Dept. Nigerian Institute for Oceanography & Marine Research (NIOMR) Lagos, NIGERIA. M: +234 805 207 2476, +234 809 360 1126	nubiao@niomr.gov.ng onubi@ictp.it onubi@ogs.it
Dr.	BASHIR Ismail Abdiaziz Haji	Director of Fisheries Management and MCS Department Ministry of Fisheries and Marine Resources Federal Government of Somalia Mogadishu, SOMALIA M: +252616268266 / +252907729788	fishmcs@mfmr.gov.so waxhubso@gmail.com
Dr.	BONOU Frédéric (Virtual)	Researcher and Lecturer Hydrological and Marine departement Centre de Recherches Halieutiques et Océanologiques du Bénin BENIN M: +229 96577917	fredericbonou@yahoo.fr
Dr.	CAMARA Ibrahima	Climate and Ocean Science Researcher Laboratory of Physics of the Atmosphere and Ocean-Simeon Fongang (LPAO-SF) Ecole Supérieure Polytechnique /Cheikh Anta Diop University of Dakar/ BP: 5085 Dakar fann, SENEGAL M: +221 772 218 731	ibrahima1.camara@ucad.edu.sn
Dr.	CARDIN Vanessa (Virtual)	Sezione di Oceanografia Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS Borgo Grotta Gigante 42/c 34010 Sgonico (TS) - ITALY M: +39 0402140369, +39 3204644636	vcardin@ogs.it
Dr.	DEGBE Cossi Georges Epiphane	BENIN	gdegbe@yahoo.fr
Ms	DUKUZEMARIYA Tharcille	Lecturer INES RUHENGARI RWANDA +250 785 105 598	dukuzetharcille@ines.ac.rw
Prof.	HERMES Juliet	Manager: South African Environmental Observation Network (SAEON) Egagasini node	juliet.hermes@mandela.ac.za

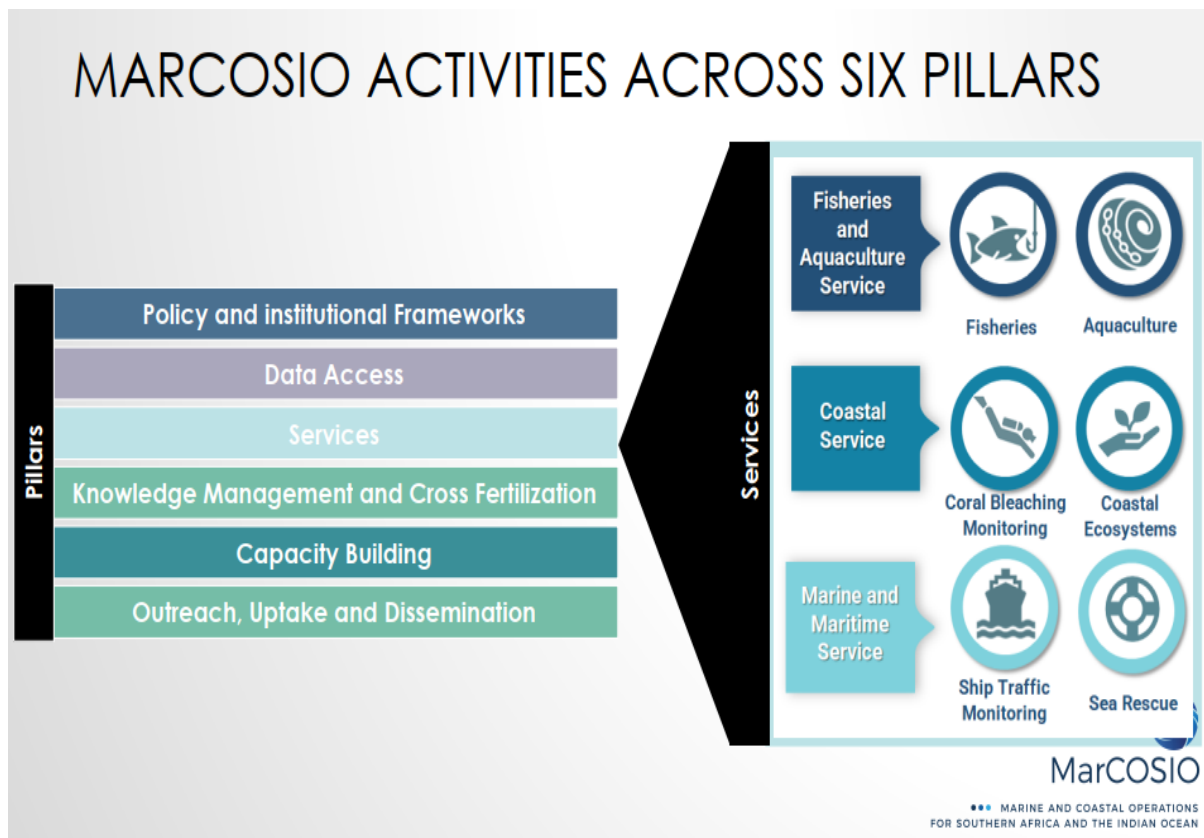
	(Virtual)	Acting Manager: South African Polar Research Infrastructure A/Professor, Department of Oceanography, University of Cape Town, Honorary Professor, Institute for Coastal and Marine Research, Nelson Mandela University, SOUTH AFRICA M: +27 834 729 159	ic.hermes@uct.ac.za
Dr	HESLOP Emma (Virtual)	Programme Specialist Physical oceanographer with significant strategic & business development expertise Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) UNESCO Headquarters, 7 Place de Fontenoy 75352 Paris Cedex 07 SP FRANCE M:	e.heslop@unesco.org
Dr	HILMI Karim	Head of Oceanography Department Océanographie Institut National de Recherche Halieutique, Centre Régional de Casablanca Casablanca, MOROCCO M:	karimhilmi15@gmail.com khilmi2022@gmail.com
Mr.	KIRUGARA David	Managing Director ENSAFO Group Ltd Nairobi, KENYA M: +254 721 360 222	david.kirugara@ensafo.com kirugara@gmail.com kirugara@live.com
Dr.	KORANTENG Kwame	Fisheries scientist and Marine Ecosystems Analyst Tema, GHANA M: +233 240 133359	kakoranteng@gmail.com
Dr.	KOUAME Adonis K. D.	University Lecturer Remote Sensing and GIS-Spatial and Environmental Analysis Felix HOUPHOUET-BOIGNY University UFR STRM/CURAT Abidjan, COTE D'IVOIRE M: +225 778 085 893	adonisdamien@yahoo.fr
Prof.	LAPWONG Jean Marie Bope Bope	Head Officer, Marine and Coastal Department Centre de Controle et Surveillance de la Pollution Marine Kinshasa, DEMOCRATIC REPUBLIC OF CONGO	bopebl@yahoo.fr jmbope2lap@gmail.com
Dr.	LOURENS Laing	MaRCOSIO GMES and Africa Consortium CSIR Cape Town, SOUTH AFRICA M:	llourens@csir.co.za

Dr	MDAKANE Lizwe Wandile	MaRCoSIO GMES and Africa Consortium Senior Researcher CSIR Cape Town, SOUTH AFRICA	imdakane@csir.co.za
Dr	MOBIO Brice Abaka	Abaka Brice Herve MOBIO Researcher and lecturer Climat Environnement et Développement Durable Université de Cocody Abidjan - Centre Universitaire de Recherche et d'Application en Télédétection (CURAT/UFHB Abidjan, COTE D'IVOIRE M:	mobiobrice@yahoo.fr Brice.mobio@curat-edu.org
Dr.	MOSTERT Sias	African Space Pioneer Aerospace Group Stellenbosch 7600, South Africa M: +27 82 894 0908	sias@scs-space.com www.scs-space.cm
Dr.	NYEMBO Jean Paul MWAMBA	Ministre de l'environnement, Conservation de la Nature et Développement durable Directeur National CICG/RDCCoordonnateur National CNSE Point Focal Convention d'Abidjan and Point Focal MARPOL Convention DEMOCRATIC REPUBLIC OF CONGO M: +243 997 816 451	nyembordc@yahoo.fr
Mr.	ODIDO Mika	IOC Coordinator in Africa IOC's Sub Commission for Africa & the Adjacent Island States (IOCAFRICA), UNESCO Regional Office for Eastern Africa Nairobi, KENYA M: +254 20 7621244	m.odido@unesco.org
Dr	ONDO NTYAM Sylvie Carole Epse	Head of Specialized Research Section for Marine Ecosystem (SECOMA)/MINRESI/IRAD National Coordinator of Intergovernmental Oceanographic Commission (IOC/UNESCO) Institute for Agricultural Research for Development, Marine Ecosystem research Department CAMEROON M: +237 677 818 682 / 695 799 930	sylondocarlo@gmail.com sylondocarlo@yahoo.fr
Dr	OUATTARA Dr. Tidiane	Space Expert and GMES & Africa Program Coordinator Science and Technology Division Education, Science, Technology & Innovation (ESTI) African Union Commission Addis Ababa, ETHIOPIA	OuattaraT@africa-union.org
Dr	SALEY Bashir	Senior Scientific Officer GMES & Africa Program Science and Technology Division Education, Science, Technology & Innovation (ESTI) African Union Commission	BachirS@africa-union.org

		Addis Ababa, ETHIOPIA	
Prof	SAMMARI Cherif	GSO-BlueMed TUNISIA M: +21 671 277 735	c.sammari@yahoo.fr cherif.sammari@instm.mrt.tn
Dr.	SETE Candida Ines	Director Oceanography National Institute of Hydrography and Navigation Maputo, MOZAMBIQUE M:	candida.sete@hotmail.com
Dr.	WHITTLE Christo	MaRCOSIO Project Leader GMES and Africa Consortium CSIR Cape Town, SOUTH AFRICA M: +27 82 771 9620	christo.whittle@gmail.com Cwhittle@csir.co.za
Mr.	WUDINEH Hailu	Communication Expert ETHIOPIA M: +251 911 671 683	forhailuwpro@gmail.com

.

Annex 3: MarCoSIO activities across six pillars



NB: The pillars Policy and institutional frameworks, Knowledge Managements and Cross fertilization, capacity development and Outreach, uptake and dissemination are cross cutting among all the consortia

Annex 4: UN Decade Action Hierarchy

DECADE PROGRAMME is typically global or regional in scale and will contribute to the achievement of one or more of the Ocean Decade Challenges. It is long-term (multi-year), interdisciplinary and will consist of component projects, and potentially enabling activities.

- Submitted during call, now fourth call now on 4 and 6
- Endorsed by Decade Advisory Board
- NANSSEN programme is an example and they are 44 now endorsed
- Criteria is replicability, Capacity development programme
- A project can be made to contribute towards an approved programme
- 12 endorsed for new endorsed
- Call 1, 2 and 3 are concluded
- UN agencies only need their agencies to be endorsed. No need for decade advisory board
- Best to go through peer-reviewed for GMES and Africa and GOOS AFRICA

DECADE PROJECT is a discrete and focused undertaking. It may be regional, national, or sub-national and it will typically contribute to an identified Decade programme.

- Submitted during call, now fourth call now on 4 and 6
- Not endorsed by advisory board

DECADE ACTIVITY is a one-off standalone initiative (such as an awareness-raising event, a scientific workshop, or a training opportunity). It will enable a programme or project or directly contribute to an Ocean Decade Challenge.

- E.g. WIOMAS submitted, no advisory board

DECADE CONTRIBUTION supports the Decade through provision of a necessary resource (e.g., funding or an in-kind contribution). A contribution can support either the implementation of a Decade Action or the coordination costs of the Decade.

Annex 5: Concept Note prepared by Prof. Juliet HERMES
(Separate file due to review points)

Annex 6: Reactions to the Concept Note of Prof. Juliet
(Separate file)

Annex 7: Presentation of FleetSAR by SIAS MOSTERT

Dr. MOSTERT delivered a presentation on the FleetSAR overview. He told the participants that despite the huge requirements for Synthetic Aperture Radar (SAR) data in Africa for Maritime Domain awareness, daily coverage for Africa EEZ by Sentinel 1 mission C-band SAR instrument is lopsided in favour of Europe.

For this reason, Aerospace Group are building a constellation of six radar satellites that once launched will improve the SAR data requirements and benefit Africa.

Aerospace Group is therefore seeking for potential customers who require large amounts of SAR data during this pre-flight planning phase so that engineers can optimize and align the payload to serve much needed data acquisitions.

At Aerospace Group, a satellite engineering training course lasting 12 months is offered and at graduation the students each returns home with their own nano-satellite and the programme costs 120,000 USD for the duration.

Annex 8: Abbreviations & Acronyms

AARSE	African Association of Remote Sensing of the Environment
AI	Artificial Intelligence
AMCEN	African Ministerial Conference on the Environment
ARGO	Profiling float
AUC	African Union Commission
CNRDPA	National Centre for Research and Development of Fisheries and Aquaculture, Algeria
CURAT	Centre Universitaire de Recherche et d'Application en Télédétection
ECMWF	European Centre for Medium-Range Weather Forecasts
EEZ	Exclusive Economic Zone
EO	Earth Observation
e-station	a processing server for environmental data processing
EUMETCast	EUMETSAT Broadcast Services
EUMETSAT	European METeorological SATellites exploitation organisation
EWE	Extreme Weather Events
FAO	Food and Agriculture Organization of the United Nations
GCLME	Guinea Current Large Marine Ecosystem
GMES & AFRICA	Global Monitoring for Environment and Security and Africa
GOOS AFRICA	Global Ocean Observing System Regional alliance for AFRICA
GOOS	Global Ocean Observing System
HF	High Frequency
IOC of UNESCO	Intergovernmental Oceanographic Commission of UNESCO
IODE	International Oceanographic Data and Information Exchange of IOC of UNESCO
JRC	Joint Research Centre of the European Commission
LME	Large Marine Ecosystem
MaRCoSIO	Marine and Coastal Operations for Southern Africa and the Indian Ocean (a GMES & Africa marine Consortium)
MarCNoWA	Marine and Coastal Areas Management in North and West Africa
MSP	Marine Spatial Planning
NFP	National Focal Point
NGO	Non-Governmental Organizations
NoDC	National Oceanographic Data Centres
OCIMS	Ocean Coastal Information Management System
PFZ	Potential Fishing Zones
RECs	Regional Economic Communities
ROMS	Regional Ocean Modelling System
SAR	Synthetic Aperture Radar
SAWS	South African Weather Services
SOMISANA	Sustainable Ocean Modelling Initiative: A South African Approach
SOOP	Ships-Of-Opportunity
SST	Sea Surface Temperatures
SSH	Sea Surface Height
UN	United Nations
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WMO	World Meteorological Organization