



# GMES AND AFRICA



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GMES & Africa Special Edition

## CSIR International Convention Centre



*"From Data to Impact: Earth Observation and Space Technology Solutions as a Catalyst for Enhancing Africa's Policy and Economic Transformation."*



# Newsletter



# Foreword

Dear Readers,

As climate-related challenges escalate and wetlands face increasing pressure across Southern Africa, the need for innovative, collaborative, and data-driven solutions has never been more urgent. In this special edition, we spotlight how Earth Observation (EO) technologies, policy engagement, and regional cooperation are transforming wetland monitoring and management into a catalyst for sustainable development.

This momentum was clearly demonstrated at the recent GMES and Africa Southern African Regional Workshop, co-hosted by the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) and the Council for Scientific and Industrial Research (CSIR). Held under the theme “From Data to Impact: EO and Space Technology Solutions as a Catalyst for Enhancing Africa’s Policy and Economic Transformation,” the event brought together stakeholders from government, academia, civil society, and the private sector.



Discussions and presentations highlighted how EO tools when paired with inclusive capacity building and institutional partnerships can enhance real-time environmental monitoring, support cross-border collaboration, and empower decision-makers at all levels. The content in this issue reflects the growing alignment between technological innovation and policy implementation, with wetlands as a vital focal point for resilience and sustainable development.

This is more than technological advancement, it’s about building resilience, fostering ownership, and laying the groundwork for a more sustainable and interconnected future. The approach is holistic, inclusive, and grounded in the Sustainable Development Goals and the African Union’s Agenda 2063.

We hope you find this edition insightful and inspiring as we collectively move from data to meaningful, lasting impact.

Warm regards,  
**Prof. Nelago Indongo**  
**SASSCAL Executive Director**



## SASSCAL Executive Director Highlights the Pivotal Role of Earth Observation in Advancing Africa's Sustainable Development

The Executive Director of the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL), Prof. Nelago Indongo, has underscored the critical role of satellite data and Earth Observation (EO) applications in promoting evidence-based decision-making, strengthening environmental governance, and advancing sustainable development across Africa.

Delivering the opening remarks at the GMES and Africa Regional Workshop held in Pretoria, South Africa, Prof. Indongo emphasized how EO and space-based technologies are transforming environmental monitoring into actionable policy and economic strategies for the continent.

The workshop, co-hosted by SASSCAL and South Africa's Council for Scientific and Industrial Research (CSIR), was convened under the theme: "From Data to Impact: Earth Observation and Space Technology Solutions as a Catalyst for Enhancing Africa's Policy and Economic Transformation."

"The GMES and Africa initiative is more than a space programme," Prof. Indongo said. "It's a vital tool for responding to environmental and climate challenges, enabling policy development, and empowering civil society with reliable data and services."

She highlighted the initiative's capacity to provide accurate and timely information through satellite and ground-based EO systems, supporting governments, researchers, the private sector, and civil society across Africa.

Prof. Indongo also expressed appreciation for CSIR's continued partnership and support in co-hosting the regional workshop, which alternates annually between the two institutions.

SASSCAL currently leads the Wetland Monitoring and Assessment Service for Transboundary Basins in Southern Africa (WeMAST II) project—one of the flagship initiatives under GMES and Africa. The regional consortium focuses on inland wetlands in the Cuvelai, Okavango, Zambezi, and Limpopo River basins. It brings together a diverse partnership of academic and research institutions, including the University of Namibia, University of Botswana, Midlands State University (Zimbabwe), University of Zambia, University of the Western Cape, Zambia's National Remote Sensing Centre, SADC WATERNET, and private sector partner Locate-It.



*Prof. Nelago Indongo SASSCAL Executive Secretary*

Meanwhile, CSIR leads the marine and coastal thematic component through the MarCOSIO Consortium, focusing on oceanographic monitoring, coastal erosion, marine weather forecasting, and pollution control.

During the second phase of the GMES and Africa Programme, SASSCAL and its partners achieved significant milestones, including enhancements to the WeMAST Geoportal, development of new EO services, comprehensive capacity-building efforts (targeting both postgraduate students and professionals), and the strengthening of policy and institutional frameworks for wetland management.

"This regional workshop serves as a platform for partners, technical experts, and stakeholders to reflect on our collective progress, share lessons learned, and chart a strategic path forward," Prof. Indongo noted.

The event also marked a turning point, as the GMES and Africa Programme transitions to operate under the umbrella of the newly established African Space Agency (AfSA). This development signifies a step toward the alignment of Earth Observation initiatives under a unified continental framework.

Prof. Indongo reaffirmed SASSCAL's commitment to the long-term expansion and sustainability of its EO services and environmental monitoring activities.

"We remain committed to deepening partnerships, expanding our footprint, and welcoming more member states into the SASSCAL Treaty, as climate change continues to challenge our region's sustainable development efforts," she concluded.

The regional workshop brought together a broad cross-section of stakeholders, including representatives from academia, government, regional organizations, civil society, and the private sector highlighting the collaborative spirit central to the success of the GMES and Africa Programme.



## WeMAST Project Ties Earth Observation to Sustainable Development Goals



*Dr Innocent Chomba National Programme Coordinator for SASSCAL Zambia Node*

A new wave of innovation in wetland management is sweeping across Southern Africa, thanks to a regional initiative that is marrying science, policy, and community engagement. At the heart of this effort is the WeMAST II project, the main objectives are advancing southern African region towards the attaining of the Sustainable Development Goals (SDGs).

The initiative focuses on the management and restoration of wetlands in transboundary basins, using advanced Earth Observation tools and geospatial data to enhance regional planning and policy development. This work is aligned with key UN Sustainable Development Goals (SDGs) and the African Union's Agenda 2063, with emphasis on sustainable agriculture, environmental protection, and technological innovation.

Dr. Innocent Chomba, National Programme Coordinator for the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) presented the outcomes and progress of the WeMAST II project at the GMES and Africa Southern African Regional Workshop, held in Pretoria, South Africa, under the theme: "From Data to Impact: Earth Observation and Space Technology Solutions as a Catalyst for Enhancing Africa's Policy and Economic Transformation."

"Wetlands are essential for agriculture, biodiversity, and climate regulation, yet they are under increasing threat," Dr. Chomba stated during his presentation. "Through WeMAST II, we are turning data into actionable insights and empowering stakeholders to protect these vital ecosystems across national borders."

At the center of the project is the WeMAST Geoportal, a user-friendly digital platform offering real-time data and maps from four major transboundary basins: the Zambezi, Limpopo, Okavango, and Cuvelai. It tracks vital indicators such as land cover, soil moisture, water quality, and flood susceptibility all critical to managing the sensitivity and resilience of wetlands.

Since entering Phase II, the project has expanded its reach and impact through: ground-truthing of satellite data to ensure accuracy and validation; a mobile app enabling communities to access data and contribute observations;

a gender-sensitive training strategy to promote inclusivity; and the establishment of a Community of Practice (CoP) to connect regional actors and institutions.

Dr. Chomba emphasized the link between science and policy implementation.

"It's not enough to have data. we must ensure that communities, decision-makers, and regional bodies can use that information to shape sustainable and inclusive policies. That's where the real impact lies. In this regards SASSCAL through the WeMAST project has been conducting capacity building programs across the region to equip the communities on how to access, validate and utilize this data," he noted.

The project complements regional cooperation frameworks such as the SADC Protocol on Shared Watercourses, the Zambezi Watercourse Commission (ZAMCOM), and the Okavango River Basin Water Commission (OKACOM). These institutions provide the governance structure, while WeMAST II enhances their effectiveness through real-time, evidence-based tools.

Dr Chomba indicated that by supporting the SDGs 2, 6, 8, 9, 11, 13, 14, 15, and 17, the project addresses goals ranging from clean water and sustainable agriculture to climate action and biodiversity protection.

"Our vision is a prosperous Africa that values its natural resources and uses innovation to solve real challenges, and WeMAST II is a step ahead towards that direction," said Dr. Chomba.

As the region continues to navigate climate change and environmental degradation, the success of WeMAST II offers a scalable model for data-driven, policy-informed, and community-centered wetland management across Africa.





## Satellite Tech Unlocking Wetland Insights: Prof. Dube Highlights Data-Driven Progress at GMES & Africa Workshop



*Prof. Timothy Dube*

The role of the SASSCAL's Wetlands Monitoring and Assessment (WeMAST) geoportal in providing Earth Observation (EO) and in-situ data in transforming wetland management across Southern Africa took center stage during a compelling presentation by Professor Timothy Dube.

In his presentation titled, "WeMAST Phase II: EO and In-situ Data Access," during the GMES and Africa Southern African Regional Workshop, Prof Dube a key technical lead from the Western University of Cape unpacked the transformative journey from traditional wetland monitoring methods to advanced satellite-driven systems. "The evolution of remote sensing technologies has dramatically improved how we monitor and manage water and wetland resources," he said.

### Enhancing Data for Wetland Monitoring

The core of Prof. Dube's session emphasized WeMAST's mission to assess EO data needs and strengthen partnerships for data access and sharing across national and regional stakeholders. The project has successfully utilized multiple EO data sources including Sentinel-2 for wetland indices, Sentinel-3 for land cover analysis, and integrated data fusion using Landsat and Sentinel imagery to improve wetland assessments across major river basins such as the Cuvelai, Limpopo, Zambezi, and Okavango which are the four main river basins that WeMAST focus on.

Complementing satellite data, such as rainfall patterns, soil moisture levels, vegetation health, land cover changes, and fire occurrences are integrated to build a comprehensive view of wetland dynamics.

### Accessibility, Capacity, and Innovation

Prof. Dube showcased how WeMAST has streamlined EO data access by leveraging platforms like ESA Sentinel Hub, Google Earth Engine, and Earth Explorer, while also ensuring full utilization of e-stations for model calibration and validation. Through the WeMAST project, SASSCAL has also developed a cloud computing framework for wetland monitoring and assessment, tested at national scales and benchmarked

against platforms such as Digital Earth Africa. This innovation supports Integrated Catchment Management by enabling continuous observation of wetland changes and allowing historical analysis over four decades.

### Addressing the Gaps

Despite the progress, Prof. Dube acknowledged several challenges that hinder full optimization of EO and in-situ data, including: limitations in data sharing and transfer capacity across institutions; gaps in high-performance computing systems; cloud cover affecting imagery quality; data storage constraints at local stations and physical inaccessibility of some wetland areas for ground validation.

To bridge these gaps, WeMAST has implemented capacity-building initiatives, including on-the-job training and stakeholder workshops to enhance technical expertise in EO data access and analytics.

### Looking Ahead

As the GMES and Africa programme progresses, the lessons shared by Prof. Dube reinforce the need for scalable, collaborative, and data-driven solutions in environmental management. "We are not only improving access to data but also strengthening the analytical tools and institutional capacity needed to turn that data into actionable insights," he concluded.

With its focus on regional integration and technological advancement, WeMAST continues to exemplify how EO can drive smarter, more sustainable environmental policy and decision-making in Africa.

## SASSCAL's Digital Innovation Strengthens Regional Cooperation on Wetlands and Climate Resilience



*Mr Albano Do Santos SASSCAL Software developer*

At a time when climate extremes are threatening ecosystems and livelihoods across Southern Africa, digital innovation and cross-border collaboration are proving to be essential tools. This was the central message from Mr. Albano Santos during his presentation at the GMES and Africa Southern African Regional Workshop held in Pretoria, South Africa. Mr. Santos is a Software Developer at the SASSCAL Headquarters in Windhoek, Namibia.

Presenting on the theme of Knowledge Management and Cross-Fertilization, Mr. Santos highlighted the growing role of the WeMAST Phase II project in promoting inter-regional cooperation on wetlands management, while also enhancing the use of Earth Observation (EO) data for practical climate adaptation strategies.

“The strength of WeMAST lies not only in the technology but, in the partnerships it builds across sectors and countries. As such from river basin commissions to local communities, we have created a shared space for data, dialogue, and decision-making through our engagements with stakeholders and communities,” said Mr. Santos.

WeMAST, short for Wetland Monitoring and Assessment Services for Transboundary River Basins is a flagship project under SASSCAL (Southern African Science Service Centre for Climate Change and Adaptive Land Management). The project supports real-time environmental monitoring through its geoportal, a digital platform that tracks variables such as vegetation, water levels, and the Soil Moisture Index (SMI).

The geoportal's SMI tool has become vital for institutions like the Cuvelai Watercourse Commission (CUVECOM), which advises Namibia and Angola on managing the Cuvelai Basin, a region heavily affected by both droughts and floods.

“With SMI, we can now identify early signs of flooding or drought and provide science-based recommendations to governments and communities,” Mr. Santos explained. “This is not just about data it's about saving livelihoods and planning ahead.”

The Cuvelai Basin is a hotspot for climate vulnerability, facing multiple challenges including land degradation, water scarcity, and deforestation. By providing real-time insights on moisture levels, the

WeMAST geoportal system enables quicker response times and more targeted interventions, particularly for smallholder farmers and regional planners.

Fostering Regional and Continental Synergies

The power of WeMAST also lies in its ability to unite different actors and regions through thematic Communities of Practice (CoPs). The platform connects stakeholders from Botswana, Namibia, Zimbabwe, and Zambia, allowing them to share knowledge, tools, and lessons learned.

The project's partnerships extend beyond Southern Africa. WeMAST collaborates with key institutions including Regional Centre For Mapping Of Resources For Development (RCMRD)-Kenya, The Centre de Suivi Écologique (CSE) -Senegal, SADC WaterNet, ICPAK (Kenya), and the EU Joint Research Centre (EU-JRC), strengthening scientific cross-fertilization and regional integration.

“Our partnerships with institutions across Africa and Europe enable us to align our work with global best practices while addressing local realities. This is how we bridge the gap between research, policy, and action,” noted Mr. Santos.

As the effects of climate change intensify across the region, the role of data-driven tools like WeMAST becomes more urgent. With its integrated approach linking governments, scientists, local communities, and technology the project offers a blueprint for how digital innovation can support the UN Sustainable Development Goals (SDGs) and the African Union's Agenda 2063.

“We are building a future where science serves the people,” said Mr. Santos. “That future is collaborative, data-informed, and regionally connected.”

With the GMES and Africa workshop emphasizing the theme “From Data to Impact,” SASSCAL's WeMAST project stands out as a compelling example of how Earth Observation and knowledge-sharing can help Southern Africa respond to the climate crisis with resilience and unity.



## SASSCAL Highlights Milestones in Policy Framework

SASSCAL's Director of Science, Technology and Capacity Development-Dr Budzanani Tacheba presented on the latest achievements of the WeMAST II including the milestones in policy framework, high level of engagements and signing of MOUs with key regional and technical institutions.

WeMAST II (Wetland Monitoring and Assessment using Earth Observation) builds on the foundations laid in its first phase, with a strong focus on operationalizing its Geoportal a powerful digital platform that provides satellite-based information services to policymakers, private sector players, and civil society for wetland monitoring and management.

"Our goal has been to strengthen policy and institutional frameworks that can support informed decision-making and sustainable management of wetlands in the region," said Dr. Tacheba during his presentation.

### Key Achievements

Dr Tacheba noted that among the notable achievements of WeMAST II is the successful signing of five Memoranda of Understanding (MoUs) with key regional and technical institutions. These include SADC WaterNet, the Regional Centre for Mapping of Resources for Development (RCMRD), the Centre de Suivi Écologique (CSE), the IGAD Climate Prediction and Applications Centre (ICPAC), and upcoming agreements with basin commissions.

WeMAST II has also forged nine strategic partnerships: six technical, two strategic, and one with a private sector entity showcasing a strong commitment to cross-sectoral collaboration.

"Engagement with institutions at regional, national, and continental levels is crucial. We have seen this through partnerships with bodies like ICPAC and RCMRD, which help us anchor the WeMAST services at various governance levels," Dr. Tacheba emphasized.

### Building a Future-Ready Framework

The project's primary thrust is to refine the policy and institutional frameworks that support wetland preservation. Dr. Tacheba highlighted that user feedback has been instrumental in shaping the services, particularly in enhancing the WeMAST Geoportal to allow interoperability and to track indicators such as invasive alien vegetation species.

Capacity building has also remained a cornerstone of the project. Through a gender-



*Dr Budzanani Tacheba Director, Science & Technology / Capacity Development*

-sensitive approach, WeMAST II aims for 50% female and 30% youth involvement across its training and stakeholder outreach programs. "Empowering our institutions and individuals with the right tools, skills, and knowledge is key to ensuring that these technological investments translate into real-world impact," he added.

### High-Level Engagements and Lessons Learned

The WeMAST II team has led 10 high-level engagements across Southern Africa including events in Angola, Botswana, Namibia, Zambia, South Africa, Zimbabwe, and Kenya, promoting the Geoportal and fostering regional cooperation. Notable forums include the SASSCAL Climate Science Dialogues and GMES & Africa Forums.

Dr. Tacheba noted that continued dialogue with basin commissions, such as those for the Okavango, Limpopo, and Zambezi rivers, has played a vital role in increasing product uptake and improving service design.

"Stakeholders have made it clear they want platforms that are user-friendly, technically advanced, and relevant to their realities. Prioritizing user needs is no longer optional; it is essential," he said.

### Looking Ahead

Despite significant strides, Dr. Tacheba acknowledged budget constraints as a challenge to expanding activities. Still, he remains optimistic, pointing to the formation of a strong Community of Practice and increasing interest from both public and private sectors as signs of a sustainable future for the initiative.

The path forward will involve deepening engagements with institutional partners, strengthening capacity development, and securing alternative funding mechanisms to ensure longevity.

"With sustained collaboration and a clear policy roadmap, WeMAST II is well-positioned to support Africa's environmental resilience and decision-making through Earth Observation technologies," concluded Dr. Tacheba.



## Key Milestones

- 5 MoUs signed with regional and technical organizations
- 9 partnerships, including private sector involvement
- 10+ regional and high-level engagements
- Geoportal enhancements based on user feedback
- Focus: Gender and youth-inclusive capacity building
- Target Regions: Okavango, Limpopo, Zambezi Basins and beyond

*SASSCAL and CSIR Management engaging at the sidelines of the GMES and Africa Southern African Region Workshop in Pretoria, South Africa*



*SASSCAL and CSIR Management pose for a group photo after an engaging at the sidelines of the GMES and Africa Southern African Region Workshop in Pretoria, South Africa*



## WeMAST's Basin Vulnerability Index: A Strategic Tool for Safeguarding Southern Africa's Wetlands



*Dr Innocent Chomba*

Once dismissed as "wastelands," wetlands are now increasingly recognized for their vital ecological and hydrological importance. Yet, the alarming decline of wetland ecosystems continues, with over 64% lost globally since 1900, primarily due to human activities. This stark reality was highlighted by National Programme Coordinator for SASSCAL Zambia Node Dr. Innocent Chomba, during the GMES and Africa Southern African Regional Workshop.

"A world without wetlands is a world without fresh water, a world without life," Dr. Chomba warned, stressing the urgent need for innovative tools and services to support sustainable wetland management.

In response to these environmental threats, the Wetland Monitoring and Assessment Service for Transboundary Basins in Southern Africa (WeMAST) project has developed a suite of geospatial products designed to inform policy and enhance wetland resilience. At the core of these is the Basin Vulnerability Index (BVI), a pioneering service that integrates multiple environmental indicators to assess the vulnerability of river basins. Dr. Chomba noted that, the BVI incorporates variables such as the Normalized Difference Vegetation Index (NDVI), Standardized Precipitation Index (SPI), Soil Moisture Index (SMI), and Soil Organic Matter (SOM) to provide a comprehensive understanding of ecosystem stress. This allows stakeholders to identify areas most at risk from climate variability, flooding, and anthropogenic pressures.

During his presentation, Dr. Chomba showcased the 2022 Basin Vulnerability Map, illustrating how the BVI can be applied to visualize and interpret the vulnerability levels of key wetland areas across transboundary river basins in Southern Africa, including the Cuvelai, Okavango, Zambezi, and Limpopo.

"The BVI is more than just a map it is a decision-support tool that empowers policymakers, conservationists, and communities with data-driven insights," he explained.

The WeMAST project, under the broader GMES and Africa initiative, seeks to bridge the gap between science and policy by providing accessible and actionable EO-based services for wetland management. Dr. Chomba emphasized that with increasing climate and development pressures on water systems, tools like the BVI are becoming essential in driving evidence-based environmental governance.

"The future of our wetlands depends on how effectively we assess and monitor them. The Basin Vulnerability Index represents a strategic contribution to that future," Dr. Chomba concluded. As Southern Africa grapples with water security, biodiversity loss, and land degradation, WeMAST's work underscores the importance of satellite-based data and collaborative regional approaches in building resilience for one of the region's most endangered ecosystems.

## SASSCAL Exhibits New Features on Its WeMAST Geoportal

The Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) has unveiled a range of enhanced features on its WeMAST Geoportal, showcasing its growing capacity to support wetland monitoring and data-driven decision-making. During the GMES and Africa Southern African Regional Workshop, Mr. Albano Santos, SASSCAL's Software Developer, presented newly developed digital tools aimed at improving data validation, field data collection, and satellite-based environmental analysis.

At the forefront of these innovations is the WeMAST Mobile Application, a user-friendly tool that enables ground truthing, offline data collection, and real-time data validation. Integrated with the WeMAST platform's front-end and backend systems, the mobile app allows users particularly those in remote areas to capture and upload field data efficiently, supporting accurate and timely environmental assessments.

"We conducted extensive user acceptance, ground truthing, and validation tests to demonstrate the app's ease of use and its ability to function without an internet connection," Mr. Santos explained.

In addition to mobile capabilities, SASSCAL has incorporated the Dunia Platform a cloud-based geospatial environment developed by GeoVille and supported by the European Space Agency (ESA) into its suite of tools. Dunia automates Earth Observation (EO) data processing and integrates datasets from sources such as Sentinel, Landsat, and Copernicus DEM, enabling efficient analysis for land use, water monitoring, and agricultural applications.

"The Dunia platform enhances our capacity for large-scale environmental monitoring by automating EO workflows and delivering high-quality spatial insights," said Mr. Santos.

One key service powered by Dunia is Water Extent Monitoring, which utilizes satellite imagery to track fluctuations in water bodies across wetlands in real time. This supports the early detection of changes linked to climate variability and human activity, thereby aiding flood risk management and sustainable water use.



*Mr Albano Do Santos SASSCAL Software developer*

Mr Santos noted that SASSCAL also introduced a new application called AgriWatch, aimed at monitoring agricultural activity and crop growth stages in wetland regions. Using multi-temporal EO data processed through the Dunia sandbox environment, AgriWatch can identify crop types and assess their development phases crucial for food security planning and resource management.

"By integrating EO analysis with ground-based data collection, WeMAST ensures its tools are both scientifically robust and practically useful to stakeholders across the region," Mr. Santos added.

These digital enhancements reflect SASSCAL's commitment to supporting the GMES and Africa initiative through innovative, user-oriented services. As pressures on wetlands and natural resources increase, the improved WeMAST Geoportal positions Southern Africa at the forefront of geospatial solutions for sustainable development.





## OKACOM Highlights the Role of WeMAST Tools in Safeguarding the Cubango-Okavango River Basin



*Mr. Mukendoyi Mutelo (OKACOM)*

The Permanent Okavango River Basin Water Commission (OKACOM) has reaffirmed the critical role of Earth Observation (EO) data and WeMAST tools in advancing sustainable management and regional cooperation within one of Africa's most ecologically significant and vulnerable river systems the Cubango-Okavango River Basin (CORB). During the GMES and Africa Southern African Regional Workshop, Mr. Mukendoyi Mutelo, Decision Support Systems Specialist at OKACOM, delivered a compelling presentation on how integrated EO technologies are reshaping basin-wide planning, monitoring, and policy formulation.

Established in 1994 by Angola, Botswana, and Namibia, OKACOM was created to serve as a technical advisory and governance platform to guide joint decision-making on the shared water resources of the basin. With the recent revision of its cooperation agreement expected in 2025, OKACOM remains central to maintaining the ecological health and economic value of the CORB, which supports the livelihoods of over one million people.

"The basin is globally unique home to the pristine Okavango Delta, a World Heritage Site and transboundary Ramsar site, and a vital ecological and tourism hub. But it also faces complex challenges that require science-driven, cooperative responses," said Mr. Mutelo.

Among the most pressing threats are hydrological variability, frequent floods and droughts, climate change impacts, increasing population pressure, land degradation, and the deterioration of wetland biodiversity. The challenge is compounded by historically limited data availability and weak monitoring systems.

In this context, Mr. Mutelo highlighted the transformative impact of the WeMAST platform, which provides data-driven tools to track environmental change, assess degradation, and generate actionable insights for both short- and long-term planning.

"WeMAST tools have strengthened our ability to monitor wetland extent, produce flood inundation maps, and run land cover time series and change detection analyses. This significantly improves the speed and precision of our environmental assessments," he explained. Mr. Mutelo noted that these capabilities are particularly important for assessing early signs of degradation in peatlands, which are increasingly under threat from cropland expansion. Furthermore, Land Use/Land Cover (LULC) data generated through WeMAST has proven useful for hydrological modeling efforts such as the SWAT model, supporting water resource simulations and scenario planning.

Beyond data analysis, OKACOM is leveraging the WeMAST platform for broader ecosystem management goals including early warning systems, community empowerment through citizen science, and the development of near real-time flood and drought indicators.

"Turning raw EO data into usable, actionable insights is a game-changer. It allows for proactive ecosystem management and informed decision-making," said Mutelo.

He also emphasized the importance of co-developing tools that align with user priorities, to ensure trust, relevance, and long-term integration into the workflows of river basin organizations, researchers, and government agencies.

Looking ahead, OKACOM sees the potential for institutionalizing WeMAST tools within member states' governance frameworks, but emphasized the need for sustained financing, capacity building, and mainstream adoption.

"If these tools are trusted and embedded into institutional planning cycles, they can be funded, scaled up, and sustained over time. This is the future we must build where data empowers both policy and people," he concluded.

With over 700,000 square kilometers of basin territory and a projected population growth to 1.3 million by 2025, the CORB is at a critical juncture. The integration of EO data, such as that offered by WeMAST, stands as a key pillar in ensuring the balance between ecological preservation and economic development in one of Africa's most dynamic transboundary water systems.

## WeMAST in Action: Taking Earth Observation Tools from Data to Community Impact



*Ms Sharon Kavhu-Dafonseca WeMAST Communications-Lead Consultant*

At the recent GMES and Africa Summit in Pretoria, the spotlight turned to the powerful intersection of WeMAST Outreach, Update, Dissemination and Community Empowerment. Mrs. Sharon Kavhu-Da Fonseca, lead consultant for WeMAST Communications, delivered a compelling presentation detailing how the WeMAST project is not only developing cutting-edge Earth Observation (EO) tools but also ensuring those tools are embraced by the people they're designed to serve. Her presentation underscored the urgency and importance of bridging the gap between innovation and end-user adoption, especially in communities across the southern African four river basins where wetland management is both a challenge and a lifeline. Through a robust communication strategy focused on awareness, visibility, and capacity building, WeMAST is redefining how scientific tools reach the grassroots.

"With the Users – For the Users": A Guiding Principle

Mrs. Kavhu-Da Fonseca emphasized WeMAST's commitment to inclusive, user-centered communication. "Our core objective is not only to raise awareness but also to empower stakeholders with tools and knowledge that can influence real-world decisions," she stated.

With its slogan, "With the Users – For the Users," the WeMAST initiative is intentionally designed to amplify engagement, uptake, and utility of EO services through consistent dialogue with end users.

### Strategic Channels for Outreach

To make EO products accessible and relatable, WeMAST II Communications employed a variety of outreach strategies, including:

- Digital storytelling (experts demystifying EO, WeMAST product and services)
- Weekly Podcast sessions that demystify wetland monitoring tools.
- Feedback digital story telling from the communities in southern African region.
- Capacity-building workshops: including field training.
- Online training targeting key environmental stakeholders; river basins, researchers, government.
- Community-focused media, including captioned photo stories, video dialogues, and interactive digital content.
- Awareness during exhibitions, such as the recent showcase at the Zambia Water Forum and Exhibition (ZAWFE) in June 2025.

### Rising Visibility, Expanding Impact

The data presented reflects tangible growth between September 2024 to June 2025:

- LinkedIn followers rose from 4,792 to over 7,000,
- Facebook increased from 2,700 to 3,100,
- Twitter from 856 to 887,
- YouTube subscribers climbed from 602 to 650.

She noted that the digital impressions consistently average above 85%, and that is all attributed to the creative and consistent use of captioned visuals, "Wetlands Nuggets", and Q&A-style video features on EO innovations.

### Ground-Level Engagements: From Zimbabwe to the Region

Mrs. Kavhu-Da Fonseca also highlighted field-level training efforts, particularly:

- In Zimbabwe (October 2024), the WeMAST team conducted hands-on training with ZAMCOM stakeholders, offering practical instruction on using the WeMAST Geoportal, its QGIS plugin, and the mobile app for field data collection.
- A virtual workshop in November 2024 focused on enhancing user understanding of EO tools, including the Mapographics policy brief designed for decision-makers.
- Last year more training on EO data access, validation and utilization was held in Zambia, Botswana and Namibia where the numbers of participants were very overwhelming.

These initiatives proved vital in expanding the platform's reach and usability within communities directly affected by wetland degradation and climate variability. Addressing Gender Gaps in EO Engagement

One of the more concerning insights shared was the low participation of women in EO data training and usage. "We must ask ourselves who is missing from the room, and why?" Kavhu-Da Fonseca posed.



## WeMAST in Action: Taking Earth Observation Tools from Data to Community Impact

“WeMAST is now actively exploring gender-sensitive digital strategies, aiming to develop content and campaigns specifically designed to encourage women’s participation in EO data access and validation. This includes targeted storytelling, female-focused capacity-building programs, and visibility for women already using EO tools in the field,” said Mrs Kavhu-Da Fonseca.

She noted the recurring request from training feedback that the training workshops should be for longer than three days to give more room for field EO data validation workshops, suggesting the need for extended timeframes to better absorb complex geospatial concepts. In response, SASSCAL is set to redesign its capacity-building programs to span more days and integrate more interactive, scenario-based learning.

Looking ahead, WeMAST aims to:

- Expand its digital footprint through radio and TV shows, press conferences, and scientific publications.
- Design more localized content for diverse user groups across Africa.
- Continue its user-first approach, by regularly seeking feedback and adapting content to match real-time stakeholder needs.

A Model for Africa’s Environmental Future

Mrs. Kavhu-Da Fonseca’s presentation made it clear: WeMAST is more than a tool, it’s a movement, one that blends innovation, accessibility, and community insight to solve real environmental problems.



### WeMAST Expands Wetland & Water Quality

#### Monitoring to Strengthen Ecosystem Management in Southern Africa

As climate pressures and human development increasingly strain the region’s natural resources, the Wetland Monitoring and Assessment Service for Transboundary Basins in Southern Africa (WeMAST) is scaling up efforts to provide data-driven solutions for protecting critical wetland ecosystems. At the GMES and Africa Regional Workshop, Mr. Albano Santos, Software Developer at SASSCAL, presented new advancements in wetland and water quality monitoring, reinforcing the importance of satellite-based tools in ecosystem management and sustainable development.

Guided by the Ramsar Convention’s broad definition of wetlands which includes marshes, peatlands, and shallow coastal waters WeMAST

focuses on tracking the size, health, and temporal changes of wetland systems across Southern Africa’s transboundary basins. These ecosystems play a vital role in flood control, water purification, and biodiversity conservation, yet remain vulnerable to a growing range of environmental and human-induced threats.

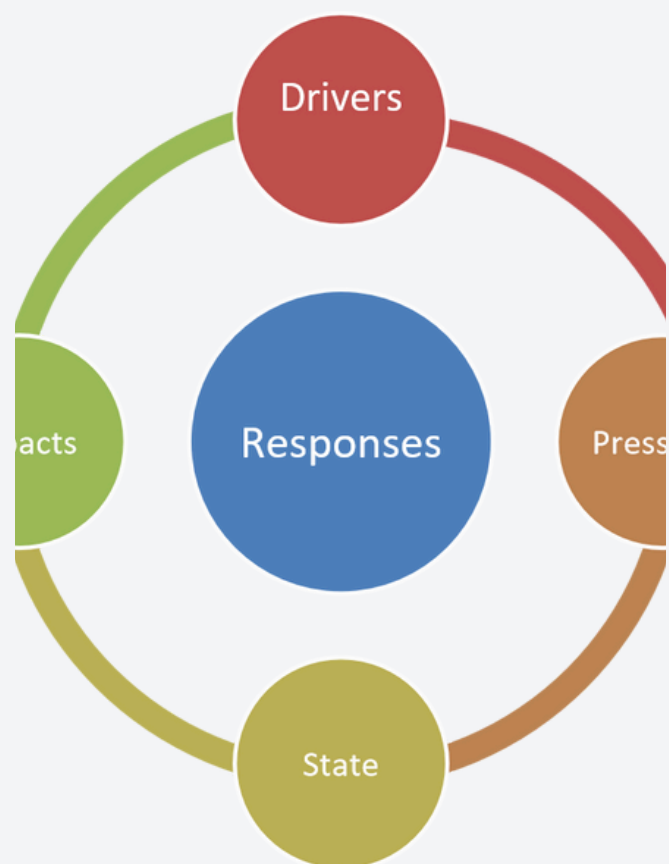
“Our objective is to offer accurate and timely information that supports evidence-based decision-making, conservation planning, and regional cooperation,” said Mr. Santos. To understand and address these threats, WeMAST has adopted the DPSIR Framework an integrated approach to environmental assessment that evaluates the relationships between Drivers, Pressures, State, Impacts, and Responses. For instance, population growth (Driver) often leads to deforestation and water abstraction (Pressure), which in turn degrade wetland water levels and quality (State). The resulting impacts including increased vulnerability to floods and health risks like respiratory diseases can be mitigated through targeted responses such as policy action and technological innovation. “By applying the DPSIR model, we not only monitor what’s happening to wetlands, but also identify why it’s happening and how we can respond effectively,” explained Santos.

The Wetland Monitoring and Assessment Service is part of the broader GMES and Africa initiative, supported by the African Union Commission and the European Union, which aims to harness Earth Observation (EO) technologies to support sustainable development across the continent. WeMAST, led by SASSCAL and its regional consortium partners, integrates satellite data, GIS applications, and local field data to deliver real-time monitoring tools for wetland degradation, flooding events, and ecological shifts.

Mr. Santos also introduced a complementary Water Quality Monitoring Service, which will enhance the region's ability to detect pollution and monitor aquatic health, providing essential data for water resource management, agriculture, and public health.

“Wetlands are not just biodiversity hotspots they are lifelines for millions of people,” said Santos. “With improved monitoring tools, we can ensure these ecosystems continue to provide essential services to both people and nature.”

Through WeMAST’s expanding capabilities and stakeholder collaboration, Southern Africa is building a more resilient and informed approach to wetland conservation where data transforms into action, and technology supports the protection of some of the region’s most valuable natural resources.



*Aerial shot of the wetlands in Oshakati Namibia*



## WeMAST Capacity Development Initiative Trains Over 200 Across Southern Africa, Boosts Women's Participation in Earth Observation

In a strong push toward inclusive environmental governance and sustainable wetland management, the Wetlands Monitoring and Assessment using Earth Observation (EO) and Geospatial Technologies (WeMAST) initiative has successfully trained more than 226 individuals from across Southern Africa, with a focus on enhancing gender representation and building institutional capacity. During the GMES and Africa Regional Workshop, Prof. Thomas Marambanyika showcased the impressive progress that WeMAST did in equipping stakeholders with critical EO and geospatial skills.

Designed to meet the needs of individuals, institutions, and decision-makers, the WeMAST Capacity Development programme aims to provide cutting-edge knowledge in EO data use for wetland monitoring and assessment, while promoting gender sensitivity and inclusivity. A minimum participation target of 30% women was set and surpassed in many of the in-person and virtual training events.

“Our goal has been to make this more than just a technical exercise,” said Prof. Marambanyika. “We are empowering people with knowledge and tools that are directly applicable to policy, management, and sustainable development.”

### Broad Reach Across Sectors and Countries

The training targeted a wide range of stakeholders including River Basin Organisations (RBOs), government water and environmental authorities, academia, NGOs, and local communities. Training delivery included classroom-based, on-the-job, and online modules, many of which were hosted on the African Union Commission's Digital Learning Platform.

### Training Highlights and Gender Milestones

Classroom-based trainings were held in Zimbabwe, Zambia, Botswana, and Namibia, with participation rates of women as high as 60% in Gaborone. A major online event in November 2023 trained 72 participants, nearly half of whom were women (47.2%).

In total, 89 women were trained, exceeding the target of 65. The program also reached a strong base of young professionals, with youth participation reaching over 60% in several sessions.

However, Prof. Marambanyika noted an ongoing challenge: the underrepresentation of women in policy and decision-making roles, which affected participation numbers in some higher-level workshops.

### Building Knowledge and Careers

WeMAST developed five comprehensive training materials, covering topics such as EO applications in wetland management, cloud computing using Google Earth Engine, and user guides for the WeMAST Geoportal and Mobile App. These resources have been submitted to the AUC's digital platform to ensure broader access.



*Prof. Thomas Marambanyika (Midlands States University)*

The initiative also supported 11 postgraduate students including four PhDs and two postdoctoral fellows through affiliated institutions like Midlands State University (MSU), the University of the Western Cape (UWC), and the University of Zambia (UNZA). Additional honours students from University of Botswana and University of Namibia were involved in in-situ data collection, strengthening practical learning.

In a notable achievement, Oshneck Mupepi, a WeMAST trainee, received the WaterNet Outstanding Presentation Award at the 25th WaterNet/WARFSA/GWPSA Symposium held in Lesotho in late 2024.

Student exchange and co-supervision initiatives also contributed to building regional academic collaboration, with workshops held in Zimbabwe and Kenya in 2023 and 2024 respectively.

### Feedback and Future Outlook

Feedback from trainees has been overwhelmingly positive, with many citing the direct relevance of the training to their daily work and decision-making. There was particularly high demand for hands-on, in-person training, which participants said had greater impact than virtual formats though internet connectivity remained a barrier in some cases.

Stakeholders also expressed a growing appetite for EO tools and services, reinforcing the need for continued investment in training, infrastructure, and support systems.

Prof. Marambanyika concluded by emphasizing the importance of sustainability and continuity:

“We aim not just to train users, but to create champions individuals who can return to their institutions and communities and multiply the impact of this program.”

The WeMAST Capacity Development program stands as a model for integrating technology, gender inclusion, and environmental stewardship in Africa's sustainable development agenda.

## MarCOSIO Showcases Regional Impact as CSIR Marks 80 Years of Scientific Leadership



Mr Mathew Chatty (CSIR)

**South** Africa's Council for Scientific and Industrial Research (CSIR)'s Impact Area Manager for the NextGen Enterprises and Institutions Cluste- Matthew Chatty, delivered a powerful speech underscoring the transformative role of Earth Observation (EO) technologies and the significant contributions of the MarCOSIO consortium in building institutional and infrastructural capacity across the region.

In his remarks, Chatty emphasized that the MarCOSIO consortium has successfully advanced the accessibility of EO data to key user communities, enabling informed decision-making and fostering sustainable development. He reiterated that MarCOSIO remains deeply committed to empowering both decision-makers and end users with practical tools and services tailored to their real-world needs.

"Science, research, and development for impact is imperative," said Chatty, stressing the need for EO technology to directly benefit communities and policy outcomes.

He previewed the workshop's upcoming technical program, which will spotlight urgent challenges facing the region particularly in relation to the Blue Economy Strategy. These discussions aim to align technological innovations with critical policy frameworks, and promote dialogue that is both solution-driven and inclusive.

"We must broaden accessibility so that all our citizens not just technical experts can benefit from the work being discussed here," Chatty urged.

He also outlined key priorities moving forward, including strengthening communication and outreach, building cross-sectoral partnerships, and investing in sustained human capital development to ensure that EO technologies have a lasting and inclusive impact.

### Celebrating 80 Years of the CSIR

Chatty took a moment to reflect on a major milestone for the CSIR, which is celebrating its 80<sup>th</sup> anniversary this year. Established under the Department of Science, Technology and Innovation in South Africa, the CSIR has remained steadfast in its mission: to improve the quality of life for South Africans and contribute meaningfully to Africa's scientific and technological advancement.

The organisation's values Excellence, People-Centeredness, Integrity, and Collaboration (EPIC) guide its approach to impactful science. "We are committed to delivering science that touches the lives of our people," he said.

Highlighting CSIR's broad research portfolio, Chatty encouraged attendees to think expansively about future collaboration. With expertise spanning climate change, agriculture, health, energy, manufacturing, and digital technologies, the CSIR stands as a key partner for multi-disciplinary innovation across the continent.

### Strengthening Africa's EO Ecosystem

Chatty expressed gratitude to the African Union Commission and the newly established African Space Agency, whose leadership has guided the growth and coordination of EO activities under the GMES and Africa Initiative. He called for a continued and expanded commitment to the program, envisioning a future in which Africa leverages a unified EO strategy to support development through the African Space Agency, launched recently in Cairo.

He also extended special thanks to Professor Nelago Indongo and the SASSCAL team for their role in co-hosting the event, noting the strength of the long-standing collaboration.

"Let us use this platform to deepen collaboration, cultivate innovation, and build a resilient and prosperous future for Africa," Chatty concluded.

The workshop continues with a series of technical presentations and policy dialogues, showcasing the real-world value of EO data and the collective progress being made through partnerships like MarCOSIO and GMES and Africa.

***"Science, research, and development for impact is imperative."***



## Africa's Blue Economy Needs Its Youth: MarCOSIO Champions Cross-Fertilization and Inclusion in Fisheries Governance

At the GMES and Africa Regional Workshop in Pretoria, Earth Observation experts, policymakers, and marine stakeholders gathered to spotlight the continent's evolving approach to managing its aquatic resources. A key highlight of the event was the presentation by Zukile Hutu of the Benguela Current Convention (BCC), who introduced the growing influence and replicable model of the MarCOSIO as a platform that's redefining fisheries governance through cross-fertilization of knowledge and active youth inclusion. MarCOSIO stands for Marine and Coastal Services Information Observatory.

"Young people are not just asking for a seat at the table, they are already building the next one. It's time we recognize their role in shaping Africa's aquatic future," said Hutu.

Hutu's session, titled "Knowledge Management and Cross-Fertilization", emphasized how MarCOSIO is becoming a strategic platform for integrating Earth Observation (EO) data, empowering small-scale fisheries, and promoting inclusive partnerships especially with youth across the continent.

### A Backbone Under Threat

He noted that small-scale fisheries are supporting tens of millions across Africa, anchoring livelihoods, food security, and cultural heritage and yet they face growing threats. Among the threats are: climate change, shrinking fish stocks, fragmented policies, and limited access to digital tools and finance. He indicated that the key role of the youth to sustainability are often overlooked.

"Despite their importance, small-scale fishers especially young people are too often excluded from the decision-making process. We need to flip the script and we have already started as MarCOSIO," Hutu stated.

He added, "That turning point came during the MarCOSIO Fisheries Exchange Workshop held in Dar es Salaam earlier this year. The workshop, attended by regional experts, youth, and grassroots organizations, inspired a bold proposal: the creation of a continental forum for inclusive dialogue, innovation, and governance in the blue economy."

#### A Youth-Driven Continental Forum

Hutu highlighted that out of this momentum, a four-day continental forum is now in planning designed to be a dynamic space where youth can co-lead, co-learn, and co-create. He noted that the forum Highlights include: Thematic tracks on Digital Innovation & EO Platforms, Gender Equity, Conservation Finance, and Blue Economy Governance; Special sessions for Youth and Women in Fisheries; Field visits to coastal communities and landing sites; and Exhibition of Blue Tech and Traditional Knowledge.

"The expected outcomes include: a Pan-African Declaration on small-scale fisheries and inclusive blue economy development; replication of Abalobi App in five new regions; policy briefs, youth-led innovations, and an EO-driven financing roadmap.



*Zukile Hutu*

### Cross-Fertilization: A Model of Shared Learning

MarCOSIO is founded on the principle of cross-fertilization, fostering the exchange of insights, data, best practices, and solutions across countries and sectors. "Cross-fertilization involves the exchange of ideas and practices across regions, allowing innovations developed in one country, such as by young innovators in Madagascar to influence and improve solutions in others like Namibia or Malawi," said Hutu. He said that this approach is helping to create a more connected, collaborative, and locally driven knowledge system across Africa.

#### Youth at the Heart of Cross-Continental Knowledge Sharing

As Africa accelerates the implementation of Agenda 2063, the Blue Economy Agenda, and the UN Ocean Decade, initiatives like MarCOSIO prove that digital platforms can only succeed when they connect data with people and especially with the next generation.

"Youth are the carriers of continuity and innovation," Hutu concluded. "If we equip them today, we secure the sustainability of our ecosystems tomorrow. This is our moment to get it right."

## MarCOSIO Expands Regional Reach with New Agreements to Strengthen Policy and Technical Capacity



*Dr. Obakeng Molelu*

However, she stressed that MarCOSIO is actively working to address these tensions by promoting cross-sector dialogue, creating communities of practice, and encouraging the sharing and co-creation of knowledge. Responding to the workshop's theme, "From Data to Policy," Dr. Molelu underlined the importance of transforming EO data into tools that directly inform decision-making. "We must go beyond collecting data we need to convert it into actionable information and policy-relevant products," she said. She advocated for regular publication of policy briefs, participation in legislative and regulatory discussions, and the development of science-policy interfaces. "It's essential that we communicate science in a manner that is clear and accessible to policymakers," she added. "We must also take an evolutionary rather than revolutionary approach to policy reform building trust and momentum gradually while aligning with national priorities."

With formal requests already coming in such as Comoros seeking support to establish Potential Fishing Zones and implement nearshore vessel tracking systems, MarCOSIO's relevance is growing. Dr. Molelu concluded by affirming the initiative's long-term vision: to be more than a data platform, but a strategic driver of integrated marine governance in Africa. "These new agreements and our ongoing institutional work are laying the groundwork for a lasting impact on how our continent manages its ocean and coastal resources."

At the GMES and Africa Southern African Regional Workshop, Dr. Obakeng Molelu announced a major step forward for the Marine and Coastal Services Information Observatory (MarCOSIO), revealing that at least eight new agreements are currently in progress to reinforce the project's policy framework and technical support across the region. The agreements are being developed with key national and regional institutions, including the Comoros Fisheries and Aquaculture, the Comoros Maritime Authority, the Zanzibar Ministry of Blue Economy, the Kenya Coast Guard Service, the Kenya Ministry of Fisheries, the Madagascar Ministry of Blue Economy and Fisheries, and the African Group of Negotiators Experts Group (AGNES) based in Nairobi, Kenya.

"These partnerships are not only vital for the sustainability of MarCOSIO but also to ensure that Earth Observation (EO) data is meaningfully integrated into national policies and coastal resource management strategies," said Dr. Molelu. She emphasized that beyond data delivery, these collaborations aim to establish institutional mechanisms for long-term use, implementation, and governance of MarCOSIO services.

Dr. Molelu highlighted the progress MarCOSIO has already made in laying the foundation for its policy and institutional frameworks. Over the past year, the initiative has hosted a series of stakeholder engagement workshops with government ministries and institutions responsible for fisheries, environment, transport, and tourism. These engagements, she said, have helped align MarCOSIO's goals with national development priorities and foster interdepartmental cooperation. "We have also established strong relationships with regional organizations like SADC, the Abidjan Convention, and the Nairobi Convention. These partnerships are critical for regional coordination and harmonization of efforts," she noted.

In addition to institutional engagement, Dr. Molelu pointed to capacity-building efforts that have produced technical expert groups, policy advisory teams, and science communicators who can bridge the often-cited gap between research and decision-making. "We have trained individuals who can translate scientific data into policy-relevant language, which is key to influencing national and regional strategies," she said.

Still, the road ahead is not without challenges. Dr. Molelu acknowledged that gaps persist between the scientific community and policymakers, often due to a lack of effective communication and differing priorities. "There are still tensions between science and politics, including trust issues and conflicting agendas. We also face challenges around data sharing, institutional mandates, and the balance between conservation goals and socio-economic needs of communities," she said.



## CORDIO Issues 40 Coral Bleaching Alerts in the Western Indian Ocean

Over the past three years, CORDIO East Africa, under the MarCOSIO initiative, has successfully issued 40 coral bleaching alerts in the Western Indian Ocean (WIO) region, marking a significant step in monitoring reef health and responding to climate-induced marine stress.

The announcement was made by James Mbugua, GIS and Remote Sensing Assistant Researcher at CORDIO East Africa, during the GMES and Africa Regional Conference held in Pretoria. In his presentation titled "WIO Coral Bleaching Alert Service", Mbugua highlighted the growing role of Earth Observation (EO) in tracking bleaching trends across countries including Kenya, Tanzania, Madagascar, Seychelles, Comoros, and other coastal nations in the region.

"We also managed to collect more than 1,000 in-situ records of coral bleaching, observed directly at reef locations," Mbugua stated, emphasizing the importance of hands-on data collection in addition to satellite-based monitoring.

To support broader regional use, CORDIO also developed a coral reef monitoring guide available in English and French, the two dominant languages in East Africa. This tool is expected to enhance local capacity for reef observation and management.

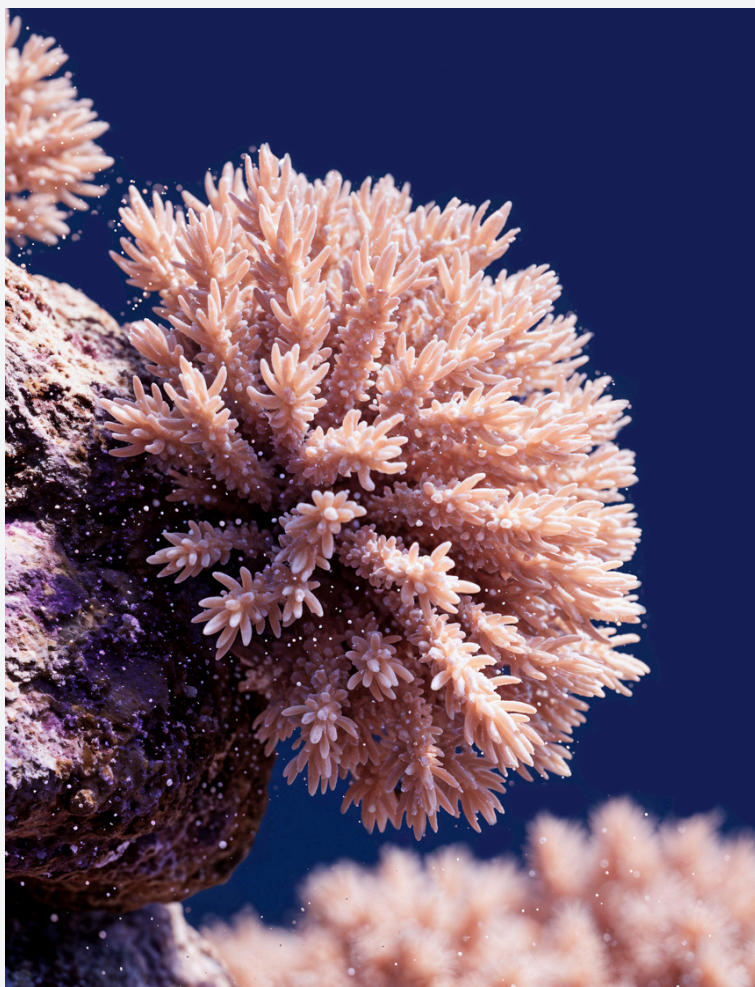
### Understanding Coral Bleaching

Coral bleaching occurs when corals become stressed typically due to elevated sea temperatures and expel the tiny algae (zooxanthellae) that live inside them. These algae not only give corals their vibrant colors but also provide essential nutrients. Without them, corals turn white and grow weaker, often leading to death if the conditions persist.

### Bridging the Gap Between Science and Practice

Mbugua acknowledged the divergent needs among users of the alert system. Park managers, for instance, require operational tools to make real-time decisions, while scientists need raw data and long-term trends to understand resilience and climate impacts.

"This has taught us that the system must cater to both ends: delivering immediate support for marine managers and in-depth analytical data for researchers," he explained.

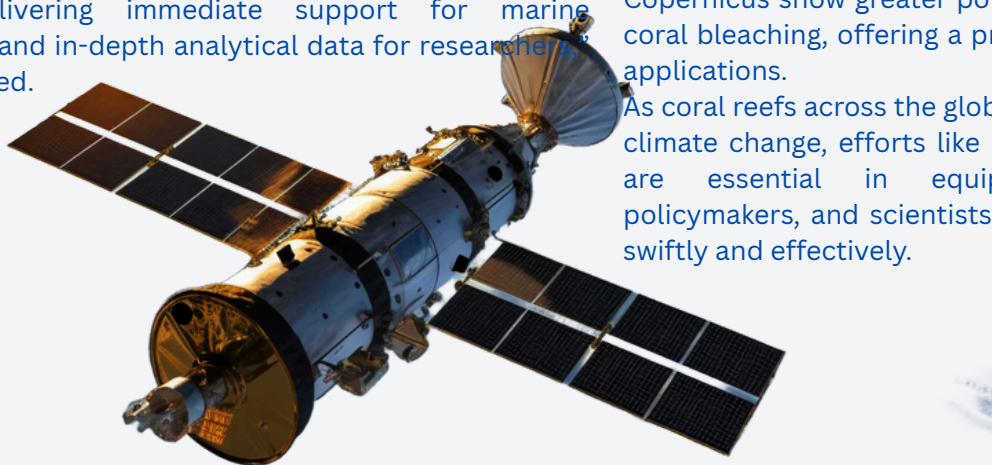


*Image: Freepik*

### Earth Observation: A Mixed Picture

While National Oceanic and Atmospheric Administration (NOAA)'s Coral Reef Watch products have long been used to track ocean heat stress, they have sometimes overestimated the severity, creating challenges for accurate assessments. Mbugua noted that NOAA products still tend to outcompete Copernicus in accessibility and longevity. However, feasibility analyses indicate that SST (Sea Surface Temperature) products derived from Copernicus show greater potential accuracy in monitoring coral bleaching, offering a promising alternative for future applications.

As coral reefs across the globe face increasing threats from climate change, efforts like MarCOSIO's CORDIO program are essential in equipping local communities, policymakers, and scientists with the tools needed to act swiftly and effectively.





## Tanzania's PFZ Mobile App Boosts Sustainable Fishing Through Satellite Data



*Prof. Happy Kokwenda*

A mobile application developed by the Tanzania Fisheries Research Institute (TAFIRI) is transforming the way small-scale fishers in Tanzania access critical ocean information, helping to strengthen both livelihoods and the broader fisheries sector. Known as the Potential Fishing Zones (PFZ) App, this innovative tool uses satellite data to guide fishing practices in a more sustainable and economically viable direction.

Speaking at the GMES and Africa Regional Workshop in Pretoria, Prof. Happy Kokwenda Peter from TAFIRI presented the app as a key example of how satellite-based information services can support local development. Her presentation, titled "Impact through Information Services," highlighted the app's contribution to promoting fishing as an informed and strategic economic activity in the Western Indian Ocean (WIO) region, particularly in Tanzania.

Prof. Peter explained that the PFZ App translates complex satellite data such as sea surface temperature and chlorophyll concentration into simple, user-friendly maps. These maps help fishers identify areas where fish are likely to be found, thereby reducing the guesswork traditionally involved in artisanal fishing.

Previously, many small-scale fishers in Tanzania relied heavily on their experience and intuition to locate fishing grounds, an approach that has become increasingly unreliable due to changing ocean conditions, rising fuel prices, and declining fish stocks.

The PFZ App addresses these challenges by providing real-time information that enhances fishing success while reducing wasted effort and resources.

The app is designed not only for fishers but also for policymakers. For fishers, it offers the ability to find productive fishing zones, monitor weather conditions in those areas, and keep digital records of their catch and sales. For decision-makers, the app provides valuable insights into how and where it is being used, allowing for better monitoring of fishing pressure zones, improved integration of data into marine spatial planning, and more effective enforcement strategies.

Since its launch, the PFZ App has already demonstrated measurable success. More than 600 users, including researchers, fisheries officers, traders, and buyers, have registered and started using the platform. An outreach campaign reached approximately 1,600 individuals, and the app was officially launched in two key regions mainland Tanzania and Zanzibar.

Early users have expressed satisfaction with the app's ability to support fishing activities, enhance market access, and improve overall livelihoods.



*Audience*

The impact of the PFZ App has also begun to resonate beyond Tanzania. Several countries in the region including Mauritius, Comoros, Mozambique, and Namibia have shown strong interest in adopting the technology or seeking technical collaboration to develop similar capabilities.

With satellite data now at the fingertips of local fishers, the PFZ App represents a major step forward in making small-scale fishing more sustainable, data-driven, and economically empowering in Tanzania and potentially across the region.



## Africa's Maritime Future: Enhancing Regional Traffic Monitoring and Security through Information Sharing



*Commander Verah Matingane*

**Dual Approach: Marine vs. Maritime Ship Monitoring**  
In her presentation, Commander Matingane outlined two distinct but interconnected aspects of ship monitoring:

- Marine Ship Monitoring focuses on the environmental and ecological impacts of ships on marine ecosystems, helping to protect ocean health.
- Maritime Ship Monitoring deals with the safety, security, and efficiency of vessels and maritime operations. It includes tracking vessel positions, detecting early threats, and enabling faster responses to emergencies.

Both approaches deliver strategic, economic, and security benefits, including real-time situational awareness, border protection, improved regional coordination, and a stronger foundation for collaboration and joint training across the continent.

### Regional and International Cooperation

Regional bodies such as the Southern African Development Community (SADC), the Indian Ocean Rim Association (IORA), the Djibouti Code of Conduct (DCoC) group, and the International Maritime Organization (IMO) have either established or are working towards creating Maritime Domain Awareness Information Sharing Centres (ISCs). These centres are crucial for tackling threats such as piracy, illegal fishing, drug trafficking, and human smuggling, which remain prevalent in African waters.

During the Southern Africa GMES and Africa Regional Workshop, Commander Verah Matingane delivered a compelling presentation on the urgent need for strengthened marine and maritime traffic monitoring in Africa. Drawing from South Africa's Defense Intelligence perspective, she emphasized the strategic, environmental, and economic importance of the ocean and the critical role that information sharing plays in securing it.

"The sea is more than a vast body of water it's a vital resource, home to endangered species like the Knysna seahorse, a source of food and minerals, and a global transport superhighway," Commander Matingane noted. "Its protection requires real-time awareness, collaboration, and a unified response."

### A Strategic Imperative

Citing the South African Defence Review of 2015, she stressed that South Africa's maritime-dependent economy and extensive trade routes require protection supported by a comprehensive Maritime Domain Awareness (MDA) strategy. This strategy includes surveillance capabilities across surface, sub-surface, air, and cyber domains ensuring that both environmental conservation and maritime security are upheld. At the heart of MDA is information sharing the ability of countries and institutions to exchange real-time data on vessel movements, environmental conditions, and potential threats. Yet, according to Matingane, regional efforts to improve maritime awareness continue to face key limitations, especially the lack of integrated platforms and coordination among countries.



*Audience at the GMES and Africa Southern African regional Workshop*

SADC, for instance, has made notable progress in developing Maritime Domain Awareness Centres (MDACs) and enhancing port security, while the DCoC has focused on curbing illicit maritime activities in East Africa.



## SASSCAL team moderating at the GMES and Africa Southern African Regional Workshop



*Ms Chenai Marangwanda Grants Manager*



*Mr John Molefe Scientific Officer at SASSCAL Botswana Node*



*Dr Kawawa Banda University of Zambia*



SASSCAL team moderating at the GMES and Africa Southern African Regional Workshop



Mr Panduleni Hamukwaya is the Programme Coordinator



Mr. Anacleto Diogo is the Scientific Officer of SASSCAL at the Angolan Node



## Social pictures at the GMES and Africa Southern African Regional Workshop





## Random pictures at the GMES and Africa Southern African Regional Workshop







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