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**The Institute of Marine Sciences' Contribution on the Tanzania's
National Level Processes and Interventions on Oceanographic
Data and Research
(28 May 2019)**

1.0 Background

The Institute of Marine Sciences was established on 17th October 1978 under the University of Dar es Salaam Act No. 12 of 1970 through the University of Dar es Salaam (establishment of the Institute of Marine Sciences) order, 1979 following the Resolution of the Council of the University of Dar es Salaam at its sitting of 18th August, 1978 to establish the Institute. The Institute is based on the premises of the former East African Marine Fisheries Research Organisation (EAMFRO) of the defunct East African Community, which was based in Zanzibar.

The objectives and functions of the Institute are specified in the constitution of the Institute. These are:

- a) To undertake research in all aspects of Marine Sciences.
- b) To provide postgraduate studies in Marine Affairs
- c) To provide advisory and consultancy services in Marine Affairs.
- d) To provide undergraduate studies in Marine Affairs in accordance with the Tanzania's national manpower demands.
- e) To undertake researches that address issues of sustainable exploitation of Marine Resources as part of merging theory and practice.

The establishment of the new Institute was considered as an important step towards developing a multi-disciplinary, broad based Institute. The inherited facilities from the former EAMFRO could not match with the new structure of the new Institute which had an expanded mandate. Efforts were therefore made by the Revolutionary Government of Zanzibar and the United Republic of Tanzania to ensure that IMS acquire more spacious facilities and additional infrastructures that could match with the expanded mandate of the new institution. It is important to note that by January 2018, IMS has expanded to a new site (Buyu Campus) located some 15 km from its old site. The completed facilities of the new IMS building at Buyu consists of about 40% of the planned facilities for the academic and administrative blocks. The remaining 60% of the academic and administrative blocks are yet to be installed. Apart from the academic and administrative blocks other infrastructure/facilities that are yet to be installed at the IMS new site include: students' hostels, a modern aquarium, a dispensary, a sport fields, and few staff houses. The completed and planned facilities at the IMS new site are considered to be ideal for the spelled mandate of IMS are envisaged to promote both regional and international collaborations.

Since its establishment, IMS researches had been focused on for key research areas:

- (i) Environment, climate change and impacts on coastal and marine ecosystems; risk management strategies,

- (ii) Food security, poverty alleviation, diseases eradication and sustainable coastal and marine resource management
- (iii) Resource management support tools (Modelling, Remote sensing, GIS and marine geo-informatics).
- (iv) Marine technology and innovation.

2.0 National Networks, Partnerships in Strengthening Oceanographic Data and Research and Their Impacts

Through the above research areas, IMS has made considerable networks/ partnerships at national, regional and international levels that have contributed to the IMS achievements in strengthening oceanographic data and research. Some of the outstanding networking/partnership at national levels include the networking between IMS and various Departments under relevant ministries (e.g. Ministry of Fisheries, Environment, Natural resources, Tourism, etc.). Through these networking/partnership IMS has been able to provide a number of extensional services that had been instrumental in the formulation of various national policies both for the government of the United Republic of Tanzania as well at the Revolutionary Government of Zanzibar. Such policies include: Tanzania fisheries policy, Marine Parks and Reserves Act (1995), Environmental legislation for Zanzibar, amongst others.

Such partnerships/networking have also contributed significantly on the socio-economic development of the seaweed farming, pearly farming and finfish farming. The seaweed, pearl and finfish farming's are slowly transforming the local coastal communities both in Zanzibar and Tanzania Mainland, through creation of alternative employment opportunities, improvement of livelihoods as well as women empowerment in households/families' affairs.

The partnership/networking have also played a key role in the Governments' policy strategies on sustainable marine resources utilization and environmental management and conservation. Along this line, IMS had been instrumental in providing the scientific knowledge that eventually led to the establishment and expansion of marine parks and conservation areas, which had been expanding from about 1000 km² in 1990 to more than 60,000 km² by 2010. The institute had also been very instrumental in most research studies that are focused at restoration of critical habitats such as mangrove forests, coral reefs and seagrass meadows – the nearshore habitats which provide a wide range of environmental, socio-economic and cultural services but have been highly vulnerable to the impacts of climate change and anthropogenic threats. Furthermore, IMS had been very instrumental in providing extensional services to a wide range of stakeholders (including, public sectors, hotel investors and coastal communities) in Tanzania Mainland and Zanzibar on appropriate adaptation strategies against coastal erosion, which happen to be one of the major environmental issues of concern along the entire coast of Tanzania.

Beside the fisheries, environment and natural resource sectors, another sector where a close partnership IMS is evident is the education sector. Over the years of the IMS historical growth of its postgraduate programme (which started in 2009), IMS had produced about 123 graduates (79 MSc and 44 PhD) and more than 80% of the IMS graduates have are either serving other public universities in Tanzania or key government sectors such as fisheries, natural resources, environment, etc. IMS had also been receiving at least 15 undergraduate students annually from other Universities in Tanzania for short courses (of up to 2 months). Thus, IMS contribution towards the growth of other high learning institutions in Tanzania is considerably significant.

3.0 Regional/international Networks, Partnerships in Strengthening Oceanographic Data and Research and Their Impacts

Along with the national partnerships and networking, IMS had also established a wide spectrum of regional and international partnership. Among the most important partnerships/networking include: The Western Indian Ocean Marine Science Association (WIOMSA) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO. As regards to WIOMSA which was established in 1992, the Institute of Marine Sciences is not only one of the founders of the regional Association but also IMS nurtured the Association during its infant stage. The earliest WIOMSA secretariat were hosted in one of the IMS offices of the old building. The IMS staff/student's participation during the WIOMSA biannual scientific symposiums had also been very impressive, with the attendance of at least 30 participants during each symposium. IMS is also the IOC-UNESCO national focal point and as such the Director of IMS have been attending the regular annual and bi-annual meetings of the IOC-UNESCO Executive Council and the IOC-UNESCO General Assembly, respectively. Within the IOC-UNESCO framework, IMS has been spearheading the IOC-AFRICA oceanographic research activities in Tanzania, including the ongoing Second international Indian Ocean Expedition (IIOE-2) which has a life span of 5 years (2015 – 2020). A total of 3 scientific cruises have so far been conducted on the Tanzanian waters. Two of the cruises were facilitated by a research vessel owned by the Republic of South Africa, the RV-Agulhas II (conducted in November 2017 and July 2018, while the other one was facilitated by a research vessel from FAO, the R/V Dr Fridjof Nansen which was conducted in April 2018. In each of the three cruises, a good number of scientists from local Tanzanian research institutions (especially from IMS and TAFIRI) were involved and a wide range of oceanographic and fisheries related data (including: physical oceanographic data, bio-geochemical data etc.).

4.0 Best Practice in the Utilization of Available Data and Research Findings in Programme and Policy Design and Decision Making (Science to Policy)

Best practices in the utilization of available data and research findings in programme and policy design and decision making (Science to policy) should consider the following key

aspects: 1- Knowledge creation and distillation, 2- Compilation of available data in accessible format, 3- Creation of strong partnerships between researchers (data producers) and policy makers and other key stakeholders, 4- Strong political will from the Governments for implementation of recommendations generated from research findings, 5- Partnerships/networking between the researchers.

Knowledge creation and distillation – involves conducting research and make serious efforts aimed at packaging relevant research findings into implementable policy practices. This may include providing specific research recommendations instead of just providing the general recommendations. **Compilation of available data in accessible formats** – refers to packaging and dissemination of data in simple and clear languages that can be easily be understood by the policy makers, instead of using complicated scientific terminologies. **Creation of strong partnerships between researchers (data producers) and policy makers and other key stakeholders** – would involve organising strategic platforms whereby the researchers, policy makers and other stakeholders meet together to share some detailed information about researches being conducted and its anticipated research outputs/goals. **Strong political will from the Governments for implementation of recommendations generated from research findings** – would involve the Governments’ demonstration by setting aside grants that are aimed at implementation of the recommendations formulated from various research findings. Partnership between researchers – May involve amongst others the practice of sharing information generated by researchers belonging to different institutions as well as sharing of research activities being conducted.

Apart from the WIOMSA and IOC-UNESCO, other outstanding IMS partnerships that had a regional and international scope are related with the following international projects: 1- the Coral Reef Targeted Research and Capacity (CRTR) Building for Management, 2-the Europe Africa Marine Earth Observation Network (EAMNet) and 3- the Sustainable Oceans, Livelihood and Food Security Through Increased Capacity in Ecosystem Research in The Western Indian Ocean (SOLSTICE-WIO). The three research projects have strengthened the networking of IMS with other regional partners in the application of modern oceanographic research tools such as GIS, remote sensing and modern *insitu* measuring devices in studying the marine critical ecosystems for sustainable management of the associated resources and improvement of people’s livelihoods.

5.0 Challenges and Gaps in Conducting Oceanographic Data and Research in the WIO Region: The Case of Tanzania

In spite of the achievements discussed above, oceanographic researches in Tanzania have been facing various challenges. The most outstanding challenges include:

1. Lack of a medium and large sized research vessels,

2. Limited human capacity in ocean science (especially the fields of physical oceanography, ocean technology, marine geosciences and marine engineering),
3. Financial constraints which in turn limits ocean network observations and acquisition of some of the basic equipment,
4. Decreased number of ships of opportunity due to piracy
5. Limited human resource capacity in assimilating the available oceanographic research data and transforming it into easily accessible formats to the scientists and policy makers.

6.0 Recommendations

In order to strengthen the IMS outputs in training, research and knowledge exchange in ocean sciences and technology within the UDSM, and enable IMS contribute its expected role towards the economic growth of Tanzania:

1. Regional and International Collaborations and Support on capacity development in ocean sciences and technology disciplines is critical.
2. Stronger collaborations between Scientists and Policy Makers and various consumers of oceanographic research data is considered to be very important

Bio Details

Dr Yohana Wilson Shaghude is a Senior Lecturer at the Institute of Marine Sciences (IMS), University of Dar es Salaam (UDSM). Dr Shaghude did his undergraduate studies at the University of Dar es Salaam (BSc Geology, 1983-1986) and postgraduate studies at the University of Southampton (MSc Oceanography; 1990), Dalhousie University (Postgraduate Diploma in Marine Affairs, 1992) and Stockholm University (PhD in Sedimentology, 2001). He has served the Institute of Marine Sciences in various posts, including: Secretary of the IMS Research Committee (from 2003-2009), Head of Physical and Environmental Marine Sciences (PEMS) Section (June 2009 – July 2012), Associate Director (July 2012 – March 2015) and Director (April 2015 – July 2017). He has officially retired from public service (under the compulsory retirement age Act) since July 2017, but is still serving UDSM at IMS through contract employment scheme. His research interest and experience include: Coastal erosion and shoreline changes; Coastal geomorphology; Sea bottom mapping; Environmental impact assessment; Sediment transport and carbonate sedimentation; Remote sensing (marine applications) and general aspects of physical oceanography. He has been teaching several postgraduate courses at IMS (including: marine geology, ocean remote sensing and research methods for marine scientists). He has a good experience of postgraduate students' supervision (for both MSc and PhD students) and he is currently supervising 3 PhD students and 2 MSc students.