



History of marine science training at the University of Dar es Salaam

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The Faculty of Science (FoS) at the University College Dar es Salaam, part of the University of East Africa, recognized the importance of fostering a strong focus on marine biology in both undergraduate and postgraduate teaching programmes and research. This realization came soon after the establishment of the FoS in 1965. The history of marine science education at the University of Dar es Salaam (UDSM) traces back to the creation of the Marine Biology Laboratory in 1967 at Kunduchi Campus, under the auspices of the University College Dar es Salaam. The administration of the Laboratory was under the purview of the Department of Zoology.

Construction of the Station

The construction of the laboratory consisted of two distinct phases as described by Hartnoll (1974): Phase One, financed by the University, comprised a large, well-equipped laboratory with all the necessary facilities. These facilities included utilities such as electricity and gas. Along the sides of the laboratory were ten 1800-litre aquarium tanks, which were supplied with seawater and compressed air. The seawater supply operated through an open circulation system that revolved around a tidal well-constructed between the laboratory and the shore, as outlined by Hartnoll in 1974. Furthermore, according to Hartnoll (1974), the tidal well was approximately 4 meters deep and received seawater through a plastic pipe that opened near the mean low water springs. Water from the well was then pumped to the aquarium tanks using a centrifugal pump with a capacity of 5500 liters per hour (Hartnoll, 1974). The elaborate seawater supply system has disappeared due to the rise in sea level and subsequent erosion of the beach.

Phase Two, which was completed later in 1967, after the University received a generous donation from the British Nuffield Foundation, introduced an extensive lecture theatre attached to the northern end of phase one, and a new one-storey building on the seaward side of the facility, for housing both students and staff (Hartnoll, 1974). This new building, which hosted living quarters on the top floor and storerooms and workshops on the ground floor was used as a rest

house. The facilities of phase two were for the joint use of the University and the neighbouring Kunduchi Marine Fisheries Research and Training Institute (KMFRTI), which was under the Ministry of Agriculture, Forests and Wildlife. Subsequently, in 1970 the University made some structural modifications to phase one, to accommodate their resident research staff. According to Hartnoll (1974), the watchman's quarters were repurposed to create a small library and offices for the lead scientist and a typist. Additionally, the general store was transformed into a compact, air-conditioned laboratory. As for the large laboratory, it was divided into three smaller laboratories and a dedicated workroom for the technician.

Introduction of marine biology in UDSM programmes

The station underwent further development and was upgraded to a Marine Biology Station in 1970. The Kunduchi Marine Biology Station (KMBS) played a significant role in facilitating undergraduate training, postgraduate research, and collaborative studies between departments in the FoS and the Institute of Marine Sciences (IMS).

The significant scientific contributions made by the station led to a proposal by the FoS and subsequent agreement by the UDSM to rename the Department of Zoology as the Department of Zoology and Marine Biology. This change aimed to consolidate the marine biology expertise within the FoS, encompassing both the Department of Zoology and the Department of Botany.

Once all the necessary infrastructure was constructed, the UDSM introduced a Marine Biology major. Additionally, in 1987, the establishment of the Applied Microbiology Unit in the Department of Botany allowed for the introduction of an Applied Microbiology major. As a result, Marine Biology students had the opportunity to pursue a double major in Marine Biology and Applied Microbiology. These developments made it possible for students who were doing a general Bachelor of Science degree to do the following combinations:

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- 1) Marine Biology and Chemistry
- 2) Marine Biology and Zoology
- 3) Marine Biology and Botany
- 4) Marine Biology and Applied Microbiology

Associated training institutions

Since its establishment, the Marine Biology programme at the UDSM had a bias towards producing graduates, focusing on marine resources conservation and management in general. In order to develop experts in fisheries management at local, district, and regional levels, and to enhance understanding of both freshwater and marine resources, the Fisheries Division of the then Ministry of Agriculture, Forests, and Wildlife recognized the necessity of establishing several institutions, namely the KMFRTI, Nyegezi Freshwater Fisheries Institute, Mbegani Fisheries Development Centre, and Tanzania Fisheries Research Institute (TAFIRI). The KMFRTI, founded in 1967, aimed to provide training for fisheries managers at the district and regional levels, initially involving experts from both the UDSM and the Fisheries Division.

The established KMFRTI under the Fisheries Division of the Ministry of Agriculture, Forests, and Wildlife shared certain facilities with KMBS. KMFRTI primarily offered a Diploma Course in Fisheries, enabling its graduates to assume middle-level positions in fisheries management at both regional and district levels. Teaching at KMFRTI was supported by five departments, namely, Fisheries Management and Administration, Fisheries Biology, Marine Engineering, Nautical Science, and Food Technology.

Integration of KMFRTI into the UDSM

In response to the absence of a degree programme in fisheries science in Tanzania, the Ministry of Natural Resources and Tourism introduced a proposal for post-graduate diplomas in fisheries and advanced diplomas in fisheries management, aquaculture, food technology, and nautical science. After considering the demands for implementing these programmes, the Ministry recognized its lack of sufficient human resources. As a result, the UDSM was approached to explore the possibility of integrating the KMFRTI into the university, with the aim of developing the proposed programmes into degree programmes. Additionally, the request was made for UDSM to continue offering the existing Diploma programme provided by KMFRTI.

Consequently, discussions regarding the integration of KMFRTI with UDSM began at a time when the UDSM community was contemplating ways to restructure both administrative and academic units, aiming to achieve academic excellence. This restructuring was driven by the UDSM Corporate Strategic Plan, which received approval from the University Council in

1994, and further supported by the outcomes of a university-wide academic audit conducted in 1998.

Drawing upon the expertise available at the time within the UDSM, specifically the Marine Biology Section of the Department of Zoology and Marine Biology, the Department of Botany and the IMS, the UDSM accepted and agreed to the proposal. To this end, on 23rd November 2000, the proposal for integrating the KMFRTI into UDSM was submitted to the Government for approval. Subsequently, on 3rd September 2001, the late Benjamin William Mkapa, the former President of the United Republic of Tanzania, assented to the integration proposal.

In light of the Government's approval of the integration between KMFRTI and UDSM, the Chief Academic Officer (CACO) at the time appointed a Committee, which I served as the Chairman. Through a letter dated October 12th, 2001, the Committee was tasked with collaborating closely with the Ministry of Natural Resources and Tourism to oversee the implementation of the proposed integration.

During its deliberations, the Committee examined three scenarios regarding the integration of KMFRTI into UDSM. These scenarios are as follows: Scenario 1 involved clustering IMS, select units of FoS, and KMFRTI into either a School or Campus College mode. However, this option could not be considered at that time due to the requirement of new flexible University Act for establishing the proposed Colleges and Schools.

In Scenario 2, which involved a Department mode integration, the objective was to protect academic and professional accomplishments, as well as the mission of establishing the marine sections of FoS, IMS, and KMFRTI. However, clustering them into a department, potentially under the FoS, could jeopardize the proposed expansion of aquatic sciences academic programmes. Additionally, this mode may not adequately address the interests of the Ministry of Natural Resources and Tourism in transferring KMFRTI to UDSM. Therefore, a higher organizational unit than a department was deemed more suitable for the envisioned integration of KMFRTI into UDSM.

In Scenario 3, referred to as the Faculty mode, the Committee suggested that the integration of KMFRTI and the Marine Biology section within the FoS should form the foundation of the proposed faculty, closely collaborating with IMS. The recommended name for this faculty was "Faculty of Aquatic Sciences and Technology" (FAST). This scenario was chosen based on the existing UDSM legal framework, which allowed for units within the university to cluster and establish faculties. The rationale behind this decision

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was the anticipation of increased student enrolment resulting from the introduction of new academic programmes. These programmes would include the Diploma programme that was already being offered at KMFRTI. Consequently, the Committee deemed this scenario suitable for integrating KMFRTI into UDSM and expanding aquatic sciences education in the country.

Establishment of FAST

The Faculty of Aquatic Sciences and Technology (FAST) was established on October 25th, 2002, as outlined in Government Notice No. 486, published on the same date. I had the honour of being appointed as the founding Dean of FAST. I served in this capacity from October 2002 until December 4th, 2006, following my appointment as the Deputy Vice Chancellor responsible for Planning, Finance, and Administration. Subsequently, the late Prof. John Ferdinand Machiwa was appointed as the Dean of FAST from 2006 to 2008.

The Faculty was established following the integration of the then KMFRTI formerly under the Ministry of Natural Resources and Tourism, and the former Marine Biology Section of the then Department of Zoology and Marine Biology, UDSM. FAST was operating from Kunduchi, in the premises of the former KMFRTI and the KMBS of the UDSM. The objectives of FAST were to undertake training, research and to provide advisory and consultancy services in all aspects of aquatic sciences, fisheries, coastal management and conservation issues to government, public and private sector.

To enhance cooperation and collaboration among the former faculties, the FAST, the FoS, and the IMS - a concerted effort was made to consolidate their partnership. As a result, each unit nominated a representative to serve on the respective boards, including the Faculty Boards and the Institute Board. This strategic arrangement aimed to ensure that academic and research programmes within these three entities were well-coordinated and mutually reinforcing. By having common membership on these boards, the units were able to articulate their academic goals effectively and foster synergy among their programmes.

The FAST consisted of two academic departments: the Department of Aquatic Environment and Conservation, and the Department of Fisheries Science and Aquaculture.

The FAST offered four academic programmes during its establishment. These programmes were as follows:

1. Bachelor of Science (B.Sc.) in Fisheries and Aquaculture
2. B.Sc. in Aquatic Environmental Science and Conservation
3. Two-year Diploma in Fisheries
4. Postgraduate programmes leading to M.Sc. and Ph.D. in Aquatic Sciences

After the establishment of the FAST, several buildings previously belonging to the KMFRTI became part of the FAST infrastructure. These buildings included: Main administration block, Engineering and Nautical Science building, TAFIRI building; UDSM building, Kitchen and dining building, Boys' dormitory, Estates building, Garage, Social club building, Residential buildings (grades A and B; total: 33 units). The integration of these buildings into FAST provided the necessary infrastructure to support the academic and administrative activities of the faculty and further strengthen its operations.

The existence of FAST was short-lived, as it underwent integration with the FoS in 2008 as part of a university-wide reorganization programme. This programme established a three-tier management structure for academic units at the Mwalimu Nyerere Mlimani Campus: Department, College/School/Institute, and Central Administration. Through this integration, the College of Natural and Applied Sciences (CoNAS) was formed, incorporating the FAST as a department. Consequently, the former FAST was renamed as the Department of Aquatic Sciences and Fisheries (DASF). In summary, the history of marine science training at the UDSM has been a long journey, resulting in the production of numerous experts who hold various positions both within the country and abroad ■



One of the classrooms at Kunduchi Campus that belonged to KMFRTI. ©Rashidi Bilali